MSc-SYSTEM DESIGN | AA.2021/2022
Tesi

Bonfire

About Fablab Torino Community Design

FINAL REPORT

Politecnico di Torino

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1. Fablab

1.1 What is Fablab

In 1998, Professor Neil Gershenfeld of the Massachusetts Institute of Technology in the United States began to imagine what would become another transformative force after the Internet revolution?

Therefore, in the spirit of exploration, Professor Neil began to offer a course on "How to Create Anything" at MIT. Perhaps it was a practical course that was more interesting or everyone wanted to be a "creator." The students with technical experience created many impressive products in the classroom. The students' enthusiasm for innovation activities continued to rise. Professor Neil was greatly encouraged. He saw the trend and value of personal customization from it, and came up with an idea. Whether it is a place that can realize the individual needs of whatever one wants, it can bring hands-on technical education outside the school classroom to children. Such a way of learning through hands-on learning may allow creativity to return to the children's world and make individualized growth possible. As a result, the innovative research concept of the International Micro Assembly

Laboratory (Fablab for short) has slowly taken shape. After continuous exploration, in 2001, the first Fablab was established in Boston, USA. In Fablab, the desire to create imaginary affairs inspires every maker. Neil doesn't just want to practice Fablab's philosophy in the United States. Thus, the first international Fab Lab was established in Costa Rica. Subsequently, Norway, India, Ghana, South Africa, Kenya, Iceland, Spain, the Netherlands and other countries have established Fablab successively and joined the Fablab global network.

1.2The history of Fablab Torino

1.2.1 The establishment of Fablab Torino

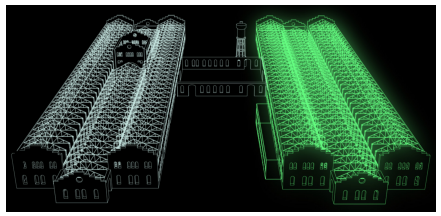
Fablab Italia was born within the Officine Grandi Riparazioni on the occasion of the celebrations for the 150th anniversary of the Unification of Italy as a section of the Stazione Futuro exhibition, curated by Riccardo Luna, director of Wired at the time. It is a temporary laboratory that represents the first example of an Italian makerspace, created starting from a proposal by Massimo Banzi, co-founder of Arduino.

As a continuation and consolidation of the Fablab Italia experience, the Fablab Torino opens in Via Egeo 16. In synergy with the Officine Arduino, the laboratory is permanently established in the post-industrial spaces of Toolbox Coworking. An innovative and lively reality, in continuous evolution, which turns out to be the ideal size to host the makerspace.

1.2.2 Timline&Big events

FABLAB TORINO

The fablab torino was the first to be born on a national level, Organized many activities and participated in many project cooperation, therefore the other Piedmontese fablabs were founded by former customers or others visters with the help of the fablab torino.



Fablab Italia was born in **Officine Grandi Riparazioni** as part of the Stazione Futuro exhibition, curated by then Wired director **Riccardo Luna**. This is a temporary laboratory, representing the **first example** of Italian makerspace, created by the suggestion of **Massimo Banzi**, the co-founder of Arduino.

Fablab Italia is born
Created a Facebook account

2011

2012

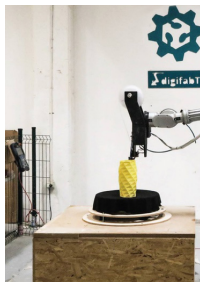
Fablab Torino opens

As a continuation and consolidation of the Fablab Italia experience, Fablab Torino as we know it today was opened in via Egeo 16. Working in collaboration with Officine Arduino, the laboratory is permanently established in the post-industrial space of Toolbox Coworking.

Fablab for Kids organized the first workshop for children, aiming to bring children closer to new technologies. Today's activities include coding, robotics, electronics and many other courses and laboratories, carried out by the Officine Innesto team.

The first Fablab For Kids workshops

2013



The first exp
DigifabTURINg
the robotic arm
co-developed b
Torino and Offi
experience culm
Algorithmic Ar
Exhibition in Octo

The DigifabTU
6 activities

2014

2 activities
Created a Instagram account
Torino Mini Maker Faire 1st Edition

The Innovation Fair arrives in the city of the Mole. Fablab Torino organizes the first edition of Mini Maker Faire, an event that has now become a fixed meeting point between the city and its innovators. Attracted dozens of exhibitors and more than 10,000 visitors.

periment of the project started with of the Comau robot by Co-de-iT, Fablab cine Arduino. This inated in the AARM- t Robot Materials ober 2017.

RINg project starts

Hello world is a course developed by Fablab Torino to teach students how to use the machine.

Created a Telegram account
69 activities (36 Hello world)

In 2019, Fablab Torino was renovated. The renovation project marks the beginning of a new phase of collaborative design and reorganization of the space, which also includes students from the Lamatilde Architecture Studio and the component design course of the Politecnico di Torino.

The renovation
32 activities (14 Hello world)

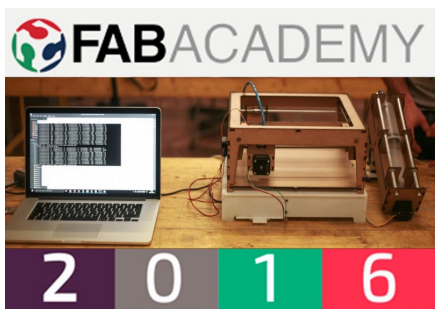
11/2020 - 04/2021
9 online activities
14 activities (until now)

015 2017 2019 2021

2016

18 activities
Fab Academy 2016

Fablab Torino is one of the venues for the 2016 edition of Fab Academy. The Fab Foundation training course is guided by Neil Gershenfeld and involves various Fablabs around the world. One of the results of Fab Academy 2016 is Pluribot-The Bubblewarp Printer.



2018

37 activities (17 Hello world)
The first edition of SEI Inventor

SEI Entrepreneurship and Innovation Academy chose Fablab Torino as the partner and seat of the Inventor training camp. The format involves dozens of students participating in the design of innovation and entrepreneurship, from ideas to prototypes. Several projects from different versions of Inventor received awards and funding to enable startups to continue their research and development work.

2020

19 activities
The year of Covid-19

Fablab Torino organized a survey of available manufacturers and skills, and coordinated cooperation with local medical institutions to supply 3D printing materials and components. ZEFIRO was born in collaboration with the Politecnico di Torino and the Virtual Laboratory, an anti-coronavirus DIY mask designed for medical staff in intensive care units. In addition, during the months-long lockdown, the studio moved online.

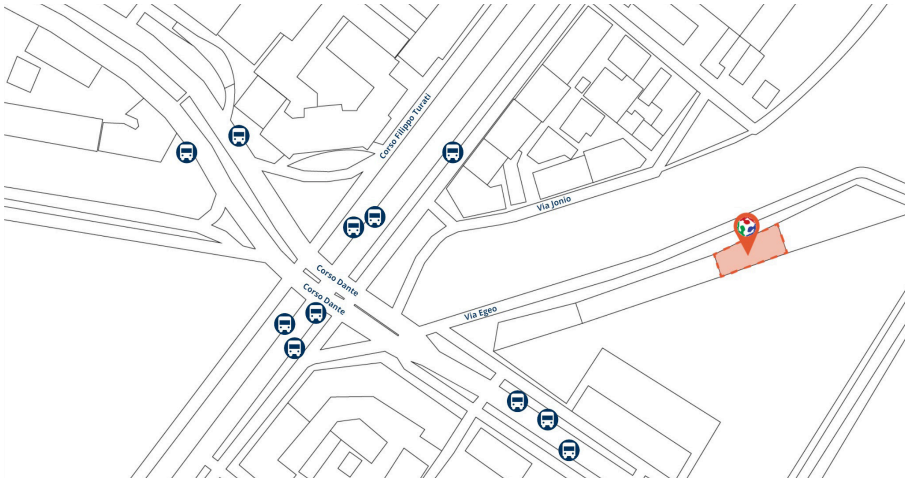
1.3 Territory research

1.3.1 Surrounding environment

Fablab Torino is located at via egeo 16 in Crocetta, this is a historic Turin residential district. It began to develop from the seventeenth century around the homonymous church of the "Crocetta".

Between the nineteenth and twentieth centuries it has continued its urban development until today. Every day there is a well-known open-air market which has become a shopping destination for many Turinese.

So Fablab Torino has a convenient transportation network, but its isolated location and poorly understood signs, lack of contact and communication with the area make it difficult to find.



Fablab floor plan

The first Italian digital manufacturing laboratory opened in Turin in 2011 with the name of Fablab Italia, on the occasion of the Stazione Futuro exhibition at the Officine Grandi Riparazioni for the 150th anniversary of the unification of Italy.

In 2012 the laboratory was reopened, this time on a permanent basis, in the spaces of Toolbox Coworking:Fablab Torino was born!

Fablab torino covers an area of about 386 square meters and often carries out activities in cooperation with the toolbox.

1.3.2 Environment inside fablab

Division of functional areas

The inside of the fablab is roughly divided into six parts:

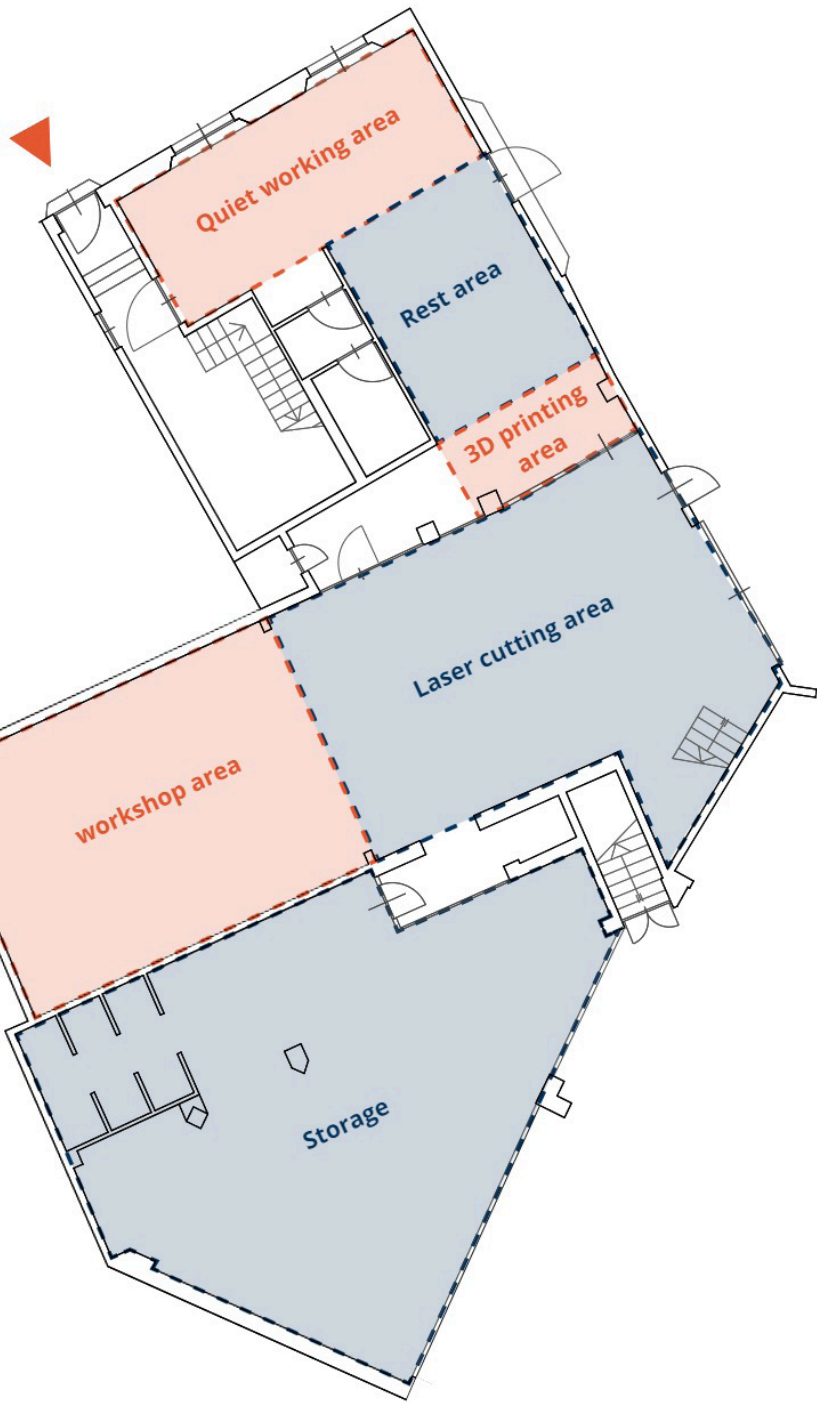
Quiet work area: at the entrance of FABLAB, equipped with tables and chairs and whiteboards, which can be used as a course place and can be freely used by users during weekdays.

Rest area: Simply separated from the quiet work area by a translucent acrylic baffle, but not soundproof. Equipped with sofa and table, users can rest and communicate here. At the same time, 3D printers are also placed here.

Laser cutting area : Separated from the rest area by soundproof doors, but still can't stop the loud noise of the laser cutting machine working. There is a usable laser cutting machine and a computer connected to it, with a large work table.

Workshop area: separated from the laser cutting area by a translucent door curtain for manual work and also used as a glue room when space is tight, currently unused.

Storage: At the innermost part of FABLAB is a huge Storage with all kinds of tools needed for manual work and some other machines, with all corners occupied by clutter and broken machines.



Space analysis

Through fieldwork and research, we found some problems in the design of FABLAB space.

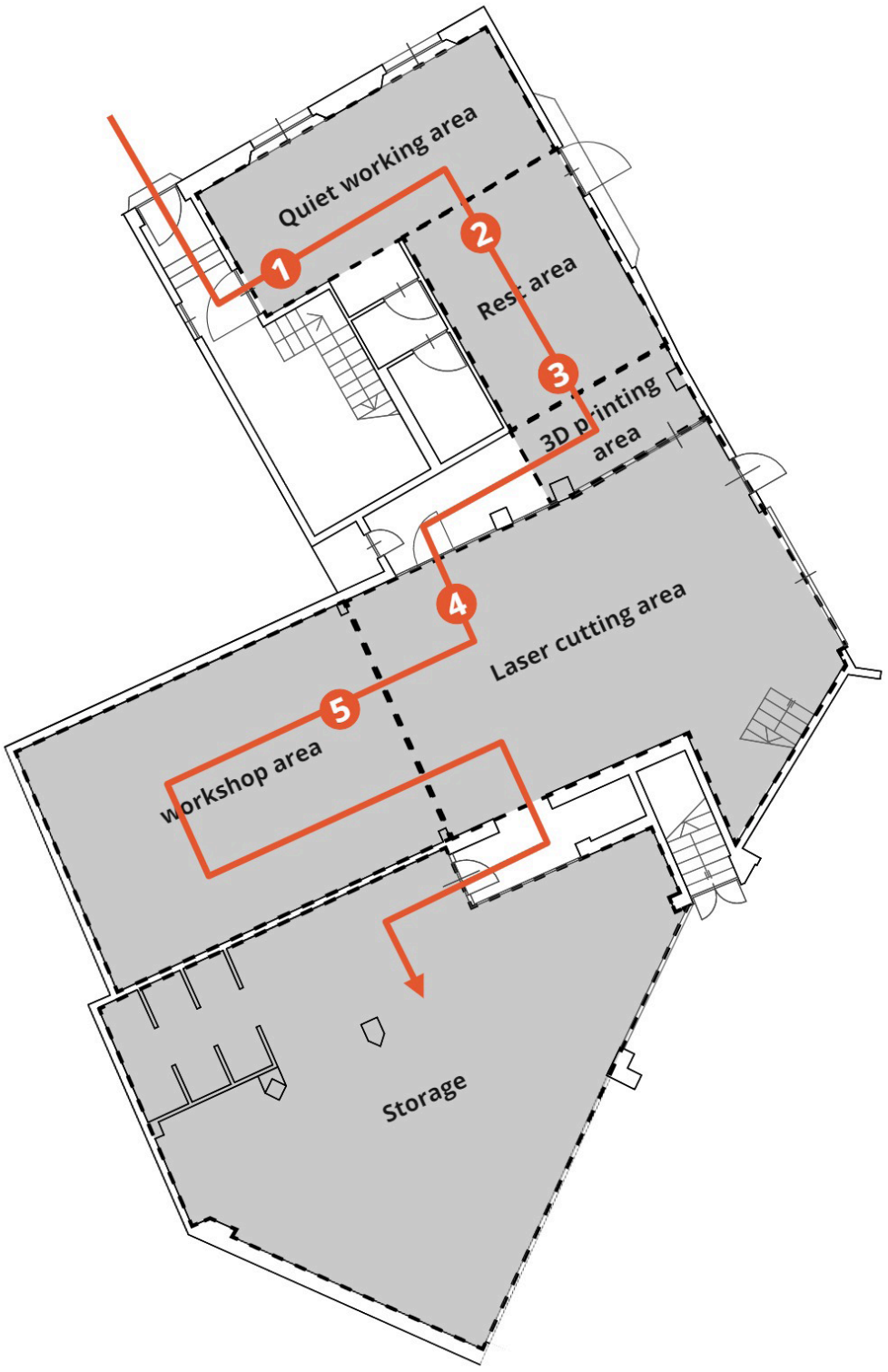
-1. Users usually work alone and need a quiet environment, but they may be affected by the noise in the rest area.

-2. For relaxing and chatting between work, there is also a drink vending machine, which is a good place.

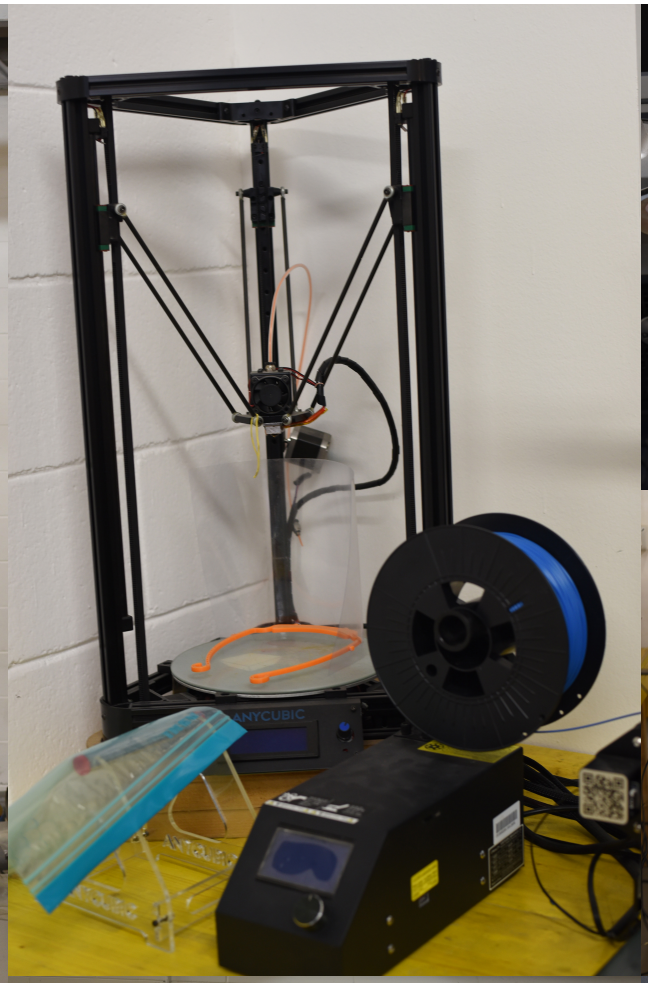
-3. Even if 3D printers are no longer used as frequently as before, they are still necessary. There are some previous works displayed here, but they do not seem to arouse people's interest.

-4. Laser cutting area is the noisiest, the largest, and the most visited place. The people here seem to be focused on the work at hand. After all, the environment here is not suitable for conversation.

-5. This is usually the place for class, but it may be affected by the noise of the laser cutting area.

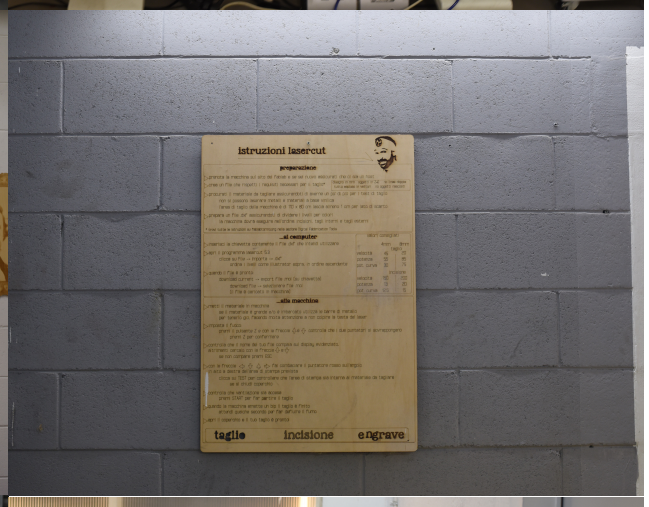



STORIES


ANYCUBIC


Taglio Pioppo 4mm


Mercury
LaserPro
www.laserpro.com


istruzioni lasercut
taglio
incisione
engrave


Mini
Maker
Faire
2017


Roland

1.3.3 Device

Any Fablab has its own requirements for equipment, including but not limited to 3D printers, laser cutters, CNC milling machines, Vinyl cutters, and many Hand Tools.

For the use of materials, mainly those that can be easily processed, such as wood, paper, fabric and many different type of plastic.

3D printers

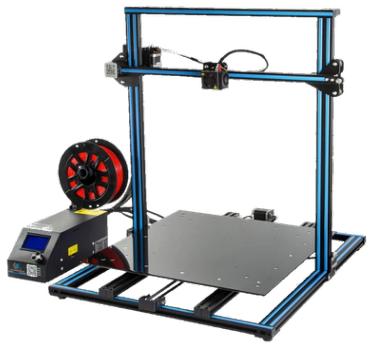
For the use of materials, mainly those that can be easily processed, such as wood, paper, fabric and many different type of plastic.

Creality 10 S5

Technology: FDM
Imprint area: 50 x 50 cm
Print height: 50 cm
Nozzle diameter: 0.4 mm
Filament diameter: 1.75 mm
Print speed: 60 mm / sec

Usage requirements: Hello world 3D print

Timing rate: € 5.00 / hour



Kossel

Imprint area: Ø 23 x 30 cm
Filament diameter: 1.75 mm

Usage requirements: Hello world 3D print

Timing rate: € 5.00 / hour

Laser cutte

Laser technology is a f
for cutting a wide vari
advantages of using a
are the high precision,
the laser.

Matilda

Cutting area: 120 x 90 cm
Workable material height: 200mm
Cutting thickness: 0-10mm
Graphics resolution: 0.0254 (1000dpi)
Laser power: 120 watts CO2
Controller: Leetro MPC6585

Usage requirements: Hello world LaserCut
Timing rate: € 1.00 / min

Eureka

Cutting area: 61 x 46 cm
Workable material height: 240mm
Cutting thickness: 0-10mm
Cooling: by air
Laser power: 30 watts CO2
Controller: Owner SEI

Usage requirements: Hello world LaserCut

Timing rate: € 1.00 / min

Wood

Paper

r

frequently used process
ety of materials. The big
a laser cutting machine
speed and versatility of

mm

2
5

CNC milling machines

The CNC milling machine is a machine tool whose movements are controlled by an electronic device, and allow machining on different materials, using a subtractive digital manufacturing technique.

Fresone

Size: 120 x 200 cm
Caliper: ER20

Timing rate: € 60 / hour

Vinyl cutter

The vinyl cutter is a numerically controlled machine used for the creation of stickers and graphics on vinyl sheets, starting from a vector design.

Roland Camm GX 24

Maximum cutting width:58 cm
Port: USB connection

Timing rate: € 1euro/min

Roland MDX-40A

Required Power Capacity: 2.1 A
Power Consumption: Approx. 210W
Operation Temperature: 41 to 104°F
Operation Humidity: 35 to 80%
(No Condensation)
Size: 669 (W) x 760 (D) x 554 (H) mm
Weight: 143.3 lb (65 kg)
Caliper: 3/4/6 mmTiming

rate: € 60 / hour

Tools

Column drills, grinders, sanders, screwdrivers, and other tools.

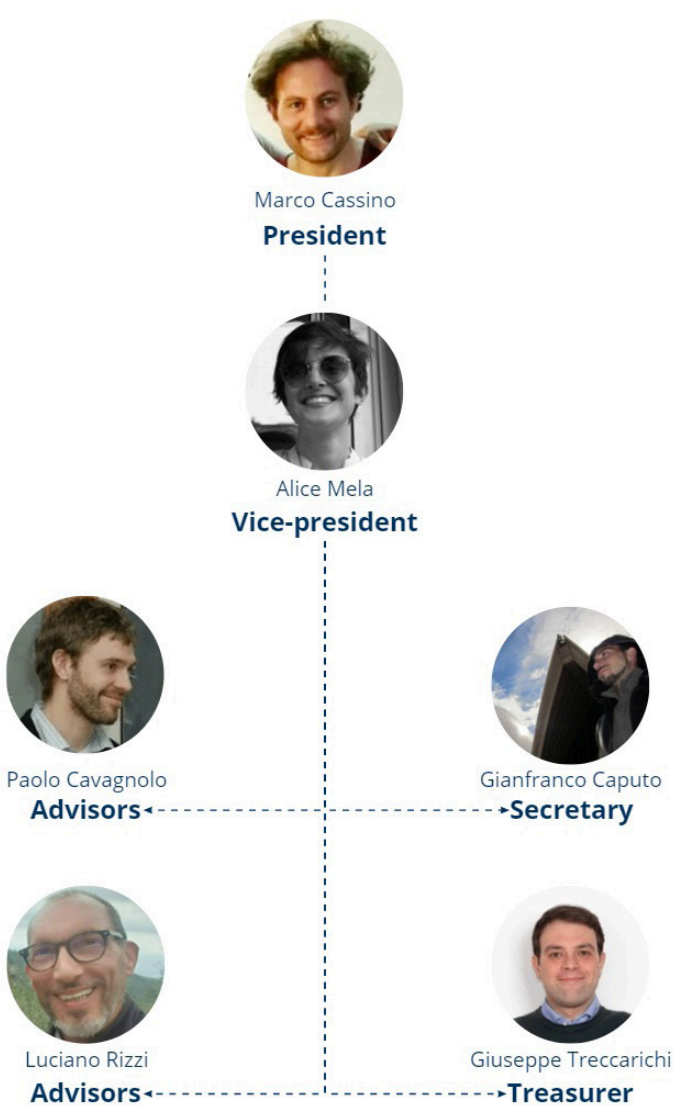
Plastic

Fabric

1.4 How it‘s running

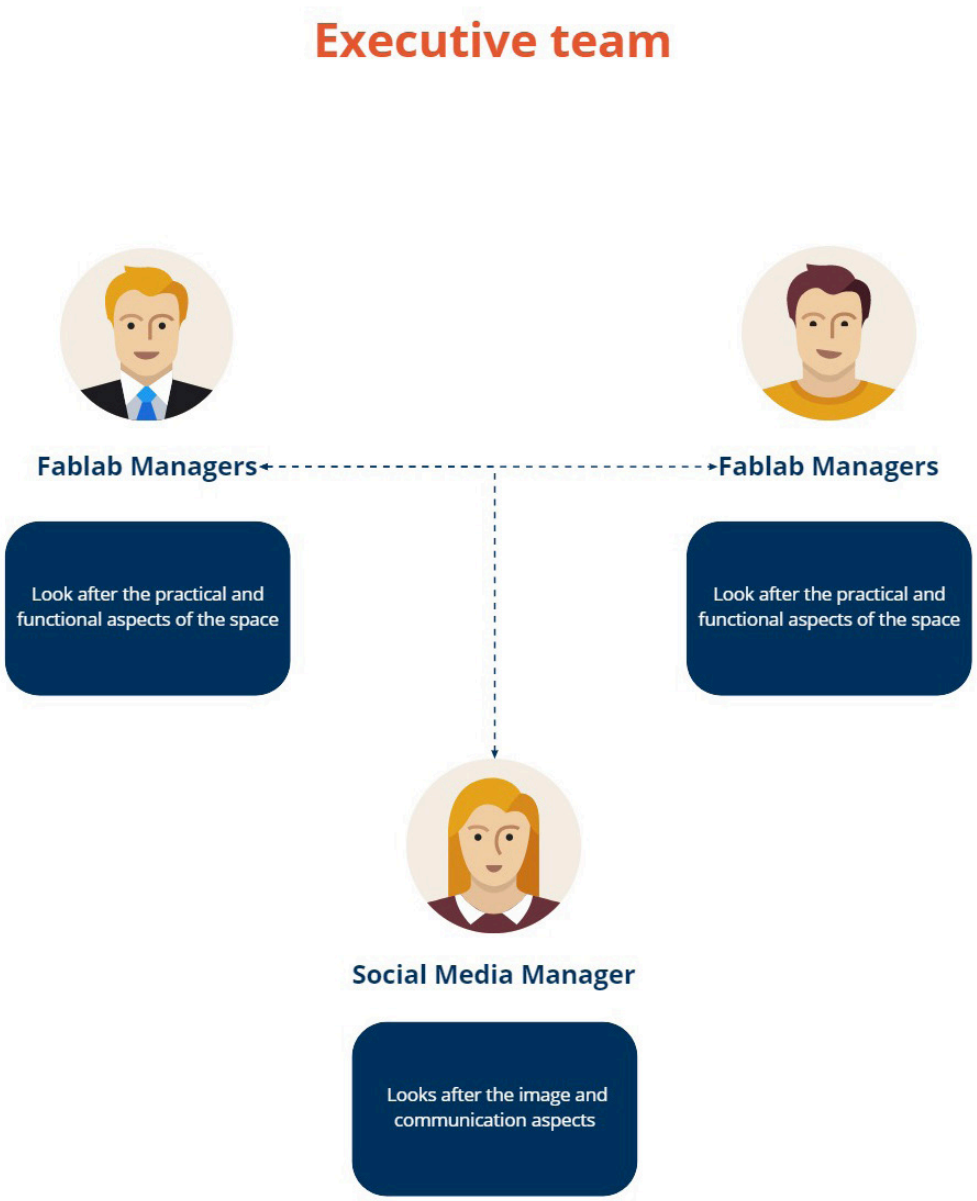
1.4.1 The main members and work content

“At the head of the association we have a management team composed of president, vice-president, secretary, treasurer and two advisors.
The executive team is made up of three professional figures: two Fablab Managers, who look after the practical and functional aspects of the space, and a Social Media Manager, who looks after the image and communication aspects. This structure serves to support our community and allows an orderly management of users.”



1.4.2 Finance

“Fablab Torino is a non-profit association. Our main income comes from the commercial agreements we make with the different schools and companies in the area that invest in the space to allow us to support a creative and technologically advanced space like ours, ensuring that many students do workshops and preparatory experiences for their inclusion in the future job. To allow us also to create attractive projects, we also participate in several calls for proposals.”



1.4.3 staff Interview

In order to have a deeper understanding of the internal situation of Fablab Torino, we conducted a brief interview with the staff there on the “open day”.

Q: How does Fablab Torino work? What are the main income and expenses?

A: non-profit association, whose goal is to earn money in order to maintain the machines and bear the maintenance costs and other costs (rent, electricity, etc ...). The money earned comes from the registration that can be carried out by anyone (100 euros per year) which allows those who register to participate in courses and use the machinery. In addition, to take advantage of some machines there are timed rates. Other funding comes from university projects and collaborations.

Q: How many members are there currently? What are their main occupations and ages?

A: The target can be anyone who subscribes annually. Obviously, most of the members are professionals in the engineering or design sector, university students and enthusiasts in general.

Q: Which machine uses the most people? What is the least?

A: The machine used most by customers is the Lasercut. One might mistakenly think that the 3d printer is the most used machine, but instead this is already often present in the homes of true enthusiasts, while the Lasercut has excessive dimensions and maintenance costs and therefore is used so much in the Fablab.

Q: Who are the main partners? We noticed that there are other fablabs in Turin, do you have any collaboration?

A: Since the project is not aimed at making money, finding important partners or sponsors is not a fundamental condition. The fablab visited was the first to be born on a national level, therefore the other Piedmontese fablaps were founded by former customers or in any case with the help of the fablab visited. Important collaborations with other fablabs are not yet foreseen. Among the external partners, certainly the most important is the Polytechnic of Turin with the various collaborations and courses that have taken place over time.

Q: What do you think are the challenges in operating fabalab? Future development plan?

A: Being a non-profit-making association, the Fablab currently does not have big goals for the future at the moment. The main objective currently is to improve the quality of the environment and of the machines already present, managing to re-enter maintenance costs based on the profits obtained.

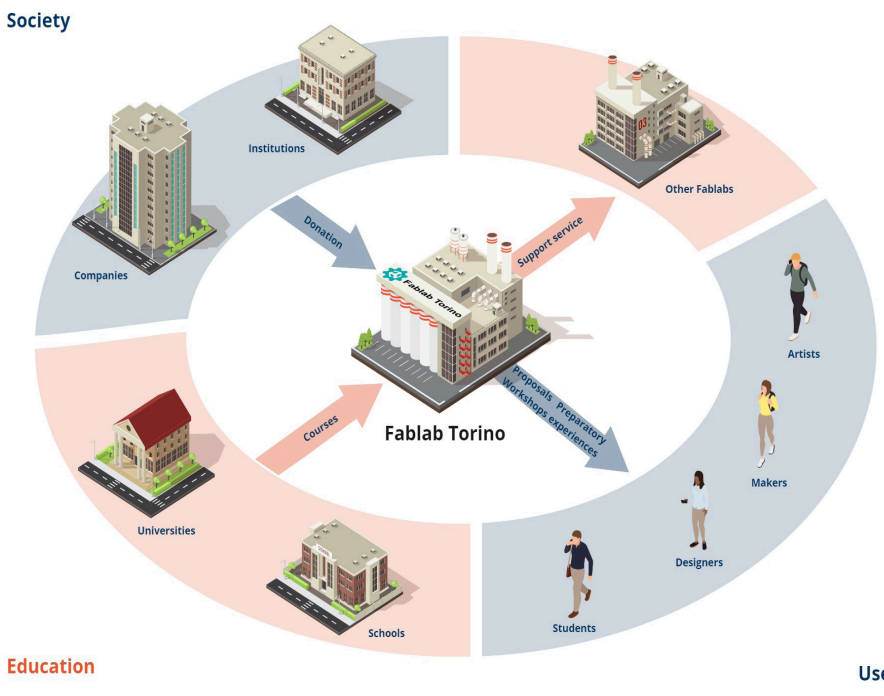
1.5 The stakeholders

1.5.1 Stakeholder Diagram

Fablab Torino has four main stakeholders: schools, companies, institutions and members. Schools include some public universities and private schools.

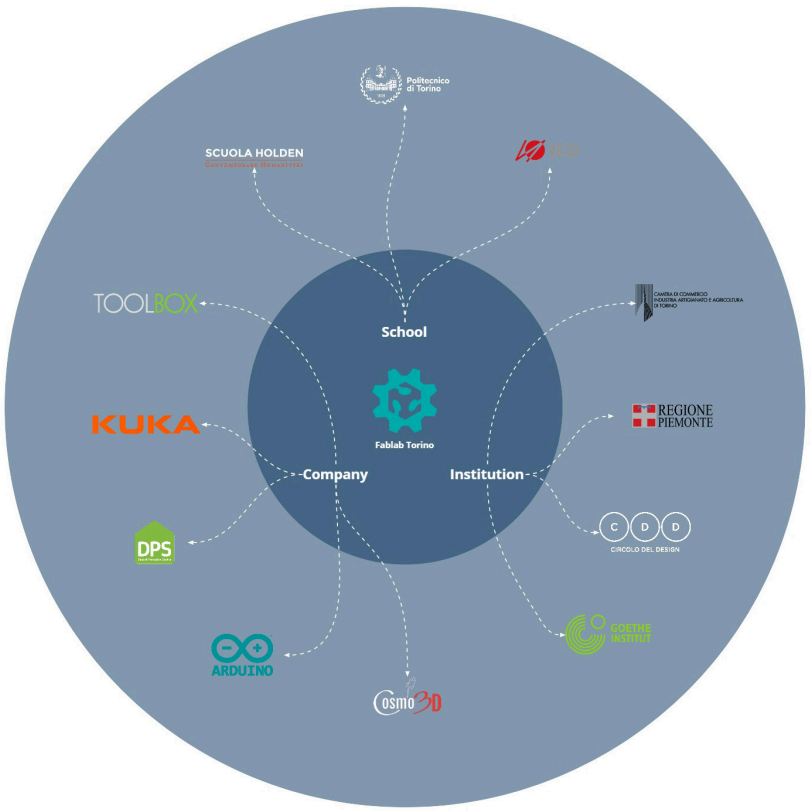
They cooperate with fablab to carry out related courses and WORKSHOP, providing opportunities for students to accumulate Preparatory experiences. Companies and institutions provide fablab with venues, funds, machines and other funding to promote the development of local innovation capabilities.

In addition, Fablab Torino is obliged to provide assistance and share experience for the establishment of other Fablabs.



1.5.2 Partners

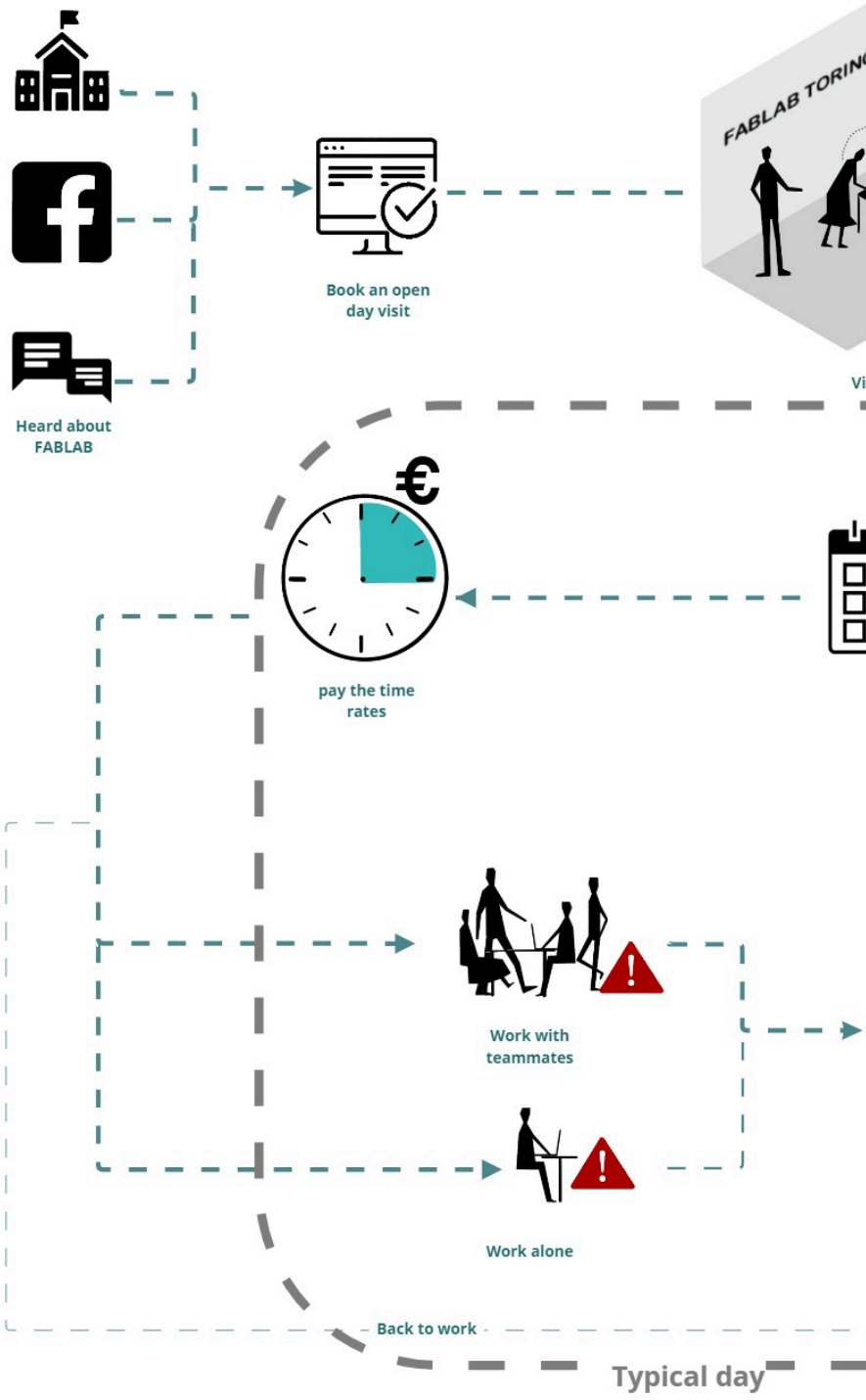
Fablab Torino cooperates with many local schools (Politecnico, IED, Scuola Holden, etc), companies (Toolbox Coworking, Kuka, DPS, Arduino, Cosmo 3D, etc), and institutions (Camera di Commercio di Torino, Regione Piemonte, Circolo del Design, Goethe Institute, etc).

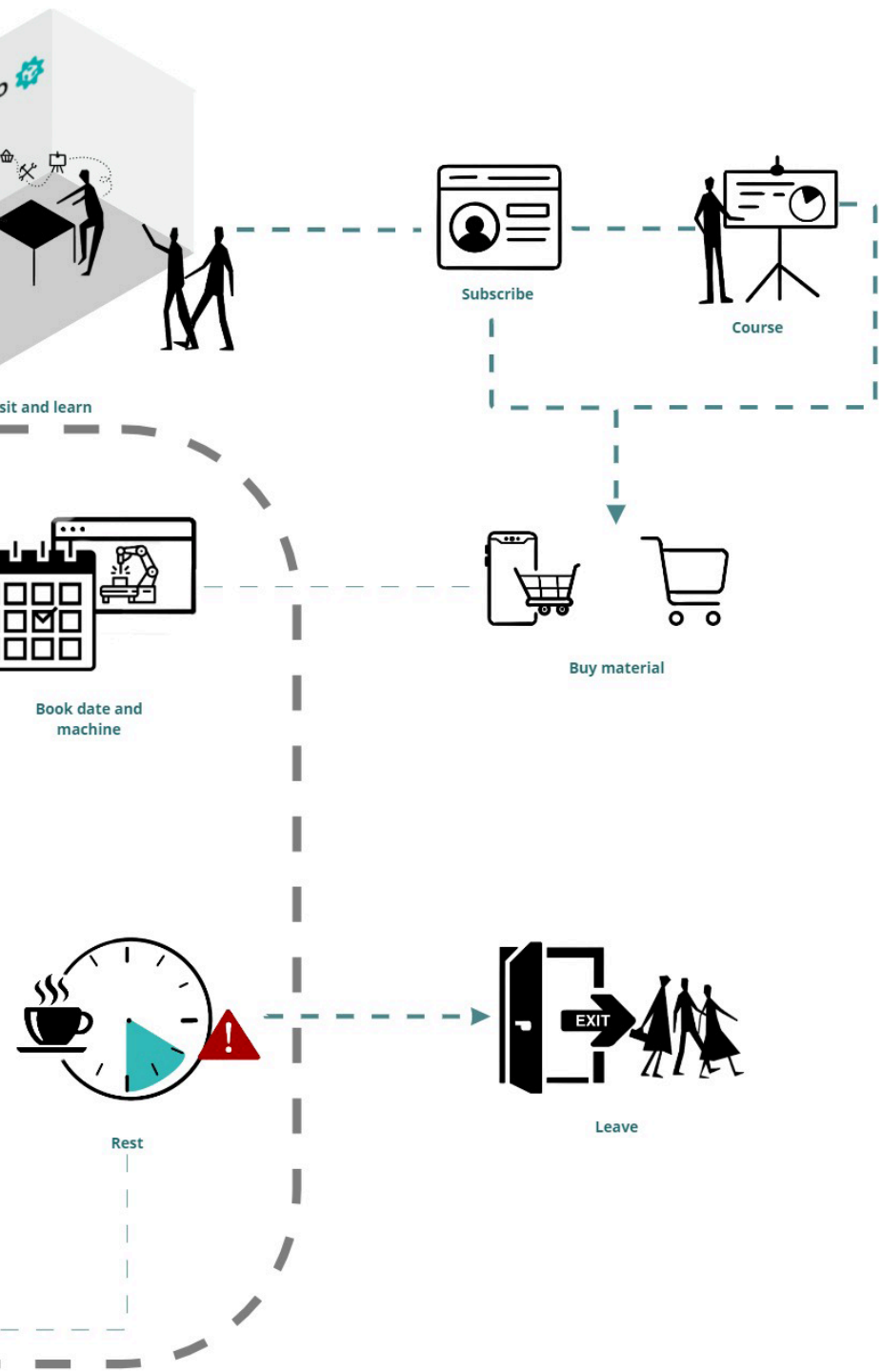


1.6 User

1.6.1 The subdivision of the users

After completing the investigation of the internal and external environment of Fablab torino, the next step is to understand the main users here, because they know best what the problem is.
Most of the regular users here are students in universities, they are masters and bachelors from public or private universities. Occasionally there will be some activities here for younger students, such as high school students or elementary school students.
In addition, there are a small number of freelance designers and artists who come here to realize their ideas or share their ideas.
So there is no doubt that the voices of these young people are vital to the development of the project.





1.6.2 User experience

In order to fully present the user's experience in the entire process, we have drawn a user experience map to more clearly show the user's interactive activities at each touch point and their mood at that time. In this way, the shortcomings in the process can be found more accurately and improved

1.6.3 User interview

Q: Do you often meet Politecnico students there? Are there many others?

A: Yes, because I went to FABLAB because of the course content, most of them were classmates during that time, and there were some others, but not too many.

Q: Did you or did you know anyone else who attended the event there after the course?

A: Maybe not.

Q: How do you usually spend a day there? For example, how long do you take a break from work? What are you doing there during your breaks?

A: We usually work there from 4:00 to 8:00 in the afternoon, and take a break in the middle to drink coffee at the TOOLBOX next to it.

Q: Can anyone help you with problems?

A: Sometimes there will be.

Q: Do the projects you do there stay there? Or take it away?

A: Everything we did in the course stayed there.

Q: Will you dine there?

A: No, sometimes I will buy some snacks at TOOLBOX when I am hungry.

Q: Will you be responsible for some daily work? Like cleaning?

A: Yes.

Q: Do you think there is any room for improvement?

A: The dust is a bit heavy, and then the laser cutter is a bit old. Then there are not enough places to charge, we have to leave before the phone is turned off, and the environment is a bit noisy, especially when someone is using the machine, so we hardly discuss there.

1.7 SWOT analysis

SWOT analysis is a strategic planning tool used to assess the Strengths, Weaknesses, Opportunities and Threats of a project or in a business or any other situation in which an organization or individual has to make a decision to achieve a goal. The analysis can concern the internal environment (analyzing strengths and weaknesses) or external environment (analyzing threats and opportunities).

Among them, the advantage of Fablab Torino is that it is the first in Italy; it is well-known locally; it has a creative incubator; it participates in schools and educational activities; it attracts small and medium-sized enterprises, individuals and students.
And its disadvantages are factors that are not conducive to the organization, such as lack of sharing among users, and wasted discussion space.

Opportunities provide some useful external environments for achieving goals, such as creating fun and motivation in activities; encouraging communication between users; providing a more comfortable working environment. The current threat facing Fablab Torino is that there is little communication with the outside; there is no sustainable operation model depending on schools and companies;
there are also capital, operating costs, and technical limitations.

Strength

/The first Fablab in Italy, richer experience
/High local reputation
/Creative incubator
/Participate in school and education activities
/Attractive to SME companies and individuals as well as students

Weakness

/Waste of storage space
/No long-term community network
/Discussion space is not working
/Lack of long-term stable users
/Less available time
/No knowledge sharing and open source

Opportunity

/Connecting companies and creators
/Help users bring ideas into action
/Create fun and motivation in activities
/Encourage communication between users
/A more comfortable working environment
/Optimize the machine
/More online activities

Threat

/Less communication with external parties
/Relying on school and companies, without sustainable operating model
/Capital, operating costs, technical limitations

S.W.O.T

The definition of problem

Fablab Torino is a place full of **innovation and vitality**, where ideas can be **turned into reality**, but there are still some problems in the whole process.

During the preliminary survey, we found that people work here but **rarely share**. This is not because they don’t want to communicate, but because they **don’t have good motivations and methods.**

For example, the community here is not mature enough and users are **not familiar with each other**. It’s not a good start for new users; the project completed here disappears silently, and people after that are unable to gain **useful experience**, which is not in line with the original intention of Fablab.

Therefore, we set the theme as "**share**", with the purpose of improving the **Fablab community**, helping users here to communicate without barriers, and encouraging them to exchange ideas. In addition, we need to find a good way to pass on the experience of the projects completed here.

2. Main topic - Share

2.1 The history of share

The Age of Sharing

The earliest use of the word sharing—Old English “scearu”—refers to the groin, where the torso of the body is divided into two legs.

In the 16th century, "sharing" meant dividing or cutting off, which was similar to "shearing". More generally, we knew that "sharing" was similar to "fragment". This sense of distinction is also used for more abstract entities such as country and wealth. The verb "share" here refers to someone sharing and distributing things. "Sharing" also means having something in common with others, which may be destiny, expense, love and disease of hard struggle.
In the quotation about "sharing" in the Oxford English Dictionary, the word is quite neutral.
It was not until the 1930s that sharing began to refer to a confessional conversation. This is in the context of the Oxford Group, which is an evangelical Christian movement. Its members will meet in each other's living rooms, gather in a circle, and publicly confess their sins. This practice is called "sharing" by them.

However, the association between "sharing" and "caring" appeared in the 1960s and flattened out until around 2000. Therefore, the combination of these two words clearly overlaps with the emergence of the hippie movement and American counterculture. So, here, "sharing" also promises a substitute for mainstream capitalist culture.
At the same time, sharing also became a key word in computing. The idea of sharing has always been linked to computers, from time sharing, through disk sharing to file sharing. For many years this use of sharing was fairly neutral (even today, when you set up printer sharing at home you don't feel inspired by the values we nowadays associate with sharing). However, when it became inextricably associated with social media around the years 2005-2007, it was imbued with the positive and pro-social senses captured by the conjunction of "sharing" with "caring."

Today, the word sharing has a range of meanings and contexts of use that play off one another: it describes our participation in social media; it refers to a new kind of economy; and it is the type of talk on which our close relationships are based. It is also a site of struggle: witness, for instance, the arguments over whether the sharing economy really involves sharing (likewise file sharing).

Language is dynamic and the meanings of words can be fluid. Time will tell whether the concept of sharing will expand to include interactions based on payment (there are signs that this is happening), or whether its meanings will be restricted to what people today consider to be true sharing.

2.2 The motivation of share

Framework of Motivation for Sharing Information in Social Media

The 10 motivation framework for sharing information and social support in social media has been developed based on the literature review we presented. Maslow's hierarchy of needs emphasizes individual aspects of motivation that drive the action of sharing information. Intrinsic and extrinsic motivation explains motivation focusing on rewards, either internal rewards for self-ego or incentives given by the external community. Herzberg's two-factor theory separates the personal and social factors that promote people's motivations. Motivations drawn by social exchange and social cognitive theories have been reflected as well. Definitions of motivation presented here include works cited for understanding each in the context of information sharing in social media.

Enjoyment: Enjoyment is one of the self-motivated and intrinsic factors that enables people to feel happy and enthusiastic when doing certain actions even without receiving external or tangible compensation. People share information in communities because they are interested in exchanging information with others in social relationships. Social media users share information for entertainment, to have fun, or to kill time. They may also consider participating in social media as a hobby, useful for finding information and sharing it with those who need it. Enjoyment is an important desire, leading people to do a variety of leisure activities.

Self-efficacy: Self-efficacy is one's perceived capability of performing and completing tasks and is widely adopted to understand knowledge sharing in communities. Social media users who are motivated by self-efficacy may feel competent at creating, finding, and distributing information to others. They may also feel a sense of accomplishment when they provide useful information to others.

Learning: Learning is an important motivation which enables people to actively participate in a variety of activities in social media. Social media users may want to learn from others by exchanging information with one another and want to be informed with updated information about topics in which they are interested.

Personal gain: Personal gain is one kind of tangible benefit, commercially driven, that social media users may expect to obtain by sharing information. It also can be considered as an external reward, in particular if there are monetary incentives. Social media users may intentionally release information related to their businesses and use social media as a channel to sell or advertise their products or services.

Altruism: Altruism is one of the most frequently tested factors in the motivation studies related to knowledge sharing in social media. Oh (2012) found that altruism is the most influential motivation for which people voluntarily gather information and provide it to answer questions from others. Social media users would like to help others without expecting external rewards. Some may hold to the ideal that people should help one another.

Empathy: Empathy is a unique motivation factor that has been proposed by Oh (2012); in the case of empathy, social media is a venue for people to gather

to provide social and emotional support for one another. Social theories (e.g., social exchange theory, social cognitive theory) mostly focused on how one can benefit from the social activities with others. Empathy has to do with caring for others' feelings or situations. Social media users may empathize with those who have trouble finding information or those who have similar information needs or concerns as theirs.

Community interest: Social media users may have feelings of attachment to certain types of social media that they use frequently. Their information-sharing activities may gather a group of people for certain topics of interest, create a community, promote it to develop community identification, and encourage a variety of activities within the community.
Social engagement: Social connectivity or engagement is one of the main reasons that people actively participate in social media. Social media users may share information in order to communicate with their peer users or collaborate with them to find solutions to problems, or simply enjoy feelings of engagement with others.

Reputation: Reputation is a well-known external reward which stimulates people to contribute and share knowledge in communities. Social media users share information because they would like to be recognized or build their reputations among their peer users. Social media users may be happy to see increases in the number of their friends or followers or to be recognized as top contributors within the community in which they are actively involved.

Reciprocity: Reciprocity is acknowledged in social exchange theory. In the context of social media, reciprocity does not simply indicate the concept of "give-and-take" in a one-to-one relationship, but it is a rather generalized reciprocity, which explains one-to-many relationships among peer users. Social media users may share information to return favors that they receive from others with an action of "pay it forward."

2.3 The impacting factors of share

Motivation for cooperation in a competitive environment
When individuals think that the other party is a partner, they will provide more accurate information. In contrast, individuals who believe that the other party is a competitor are more likely to conceal accurate information and deceive. Withholding accurate information is due to fear of exploitation and greed. Therefore, merely reaching an agreement to share information is not enough; actors must also be motivated to share information.

Trust
Given that possession of information is seen as a competitive advantage and provides a source of power, sharing information, especially with others who may be considered competitors, requires a considerable degree of trust. At the level of interpersonal relationships, trust is defined as “a state of mind that includes the intention to accept vulnerability based on positive expectations of the intentions or behavior of others” . In the context of organizational partnerships, trust is also defined as "the degree of confidence that individual partners have in each other's reliability and integrity" . Therefore, scholars regard trust as an important factor in information and knowledge sharing.

Knowledge as a Public Good
The attitudes and beliefs decisionmakers hold about the information itself may also play a role in whether they choose to share information. For example, at the individual level, some research shows that perceptions about information ownership are important influences on information-sharing attitudes. In a study by Constant, Kiesler, and Sproull (1994), participants were asked to read several vignettes describing an encounter with a coworker who was requesting help. They found that, when there was a belief that the information being requested belonged to the organization, not the individual, participants were more likely to share the information with others. Consequently, encouraging the perception that information belongs to an entire community may enhance information sharing.

Cross-Cultural Differences
Individualism-collectivism may also influence whether organizational leaders or decision makers allow information sharing with another organization. Specifically, collectivist cultures make a sharp distinction between in-group and out-group members. This distinction then influences information-sharing behaviors, with individuals more likely to share information with members perceived as being part of their in-group and less likely to share information with members perceived as being part of an out-group.

The Role of Individual Perceptions
Some barriers to knowledge contribution may not be selfishly motivated. Rather, people may wish to act in the community's interests but hesitate to do so, believing themselves unable to uphold community standards of usefulness. For instance, members of one professional virtual community appeared to be reluctant to post information that they personally considered unimportant, irrelevant, or inaccurate. Newer members also indicated that they felt intimidated by not having “earned the right” to contribute knowledge. Such self-perceptions of status may hinder information sharing. People with low status may be less willing to share information. People

may also feel they need to establish themselves as experts (ie, of higher status) before contributing and may not share if they do not feel they are qualified or have sufficient status.2 This may lead to people not sharing information because they are not sure it is o f high quality and are afraid of “losing face.”

Norm of reciprocity
Individualized reciprocity did not directly affect knowledge sharing but did help build trust. Lin et al. argued that, in contrast to individualized reciprocity, generalized reciprocity (in which sharing is not necessarily reciprocated by the recipient but may be by a third party) is seen more often in professional virtual communities. This is because online communities more commonly involve generalized, rather than one-to-one, interactions. Thus, people tend to share freely, expecting that someone in the community will at some time return the favor.

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2.4 An environment conducive to user sharing

Users of a co-working space
Co-working spaces mainly focus on creating a community, interconnecting and inspiring tenants who generally work alone. These workspaces are easily accessible and low cost, where a heterogeneous group of workers work in a flexible work environment. Social interactions between tenants are mostly stimulated by hosts or managers who facilitate social events. The most common user groups of co-working spaces are self-employed workers, entrepreneurs and freelancers, but also extended workers, small and medium-sized enterprises (SMEs), students and employees of large firms are the target groups of co-working spaces.

Motivations to work in a co-working space
The first co-working space, the Spiral Muse Coworking group, was started in San Francisco in 2005 by Brad Neuberg . Since 2005, the popularity of co-working spaces has increased. This was a result of the awareness of the disadvantages of working in a classic office, at home or at the local café, such as the possible lack of social and professional interaction, isolation, and the blurred boundary between a private and a professional life. Kojo and Nenonen (2017) suggested that the main drivers for the evolution of co-working spaces were new ways of working, attractiveness, work/life balance, economic efficiency and sustainability.

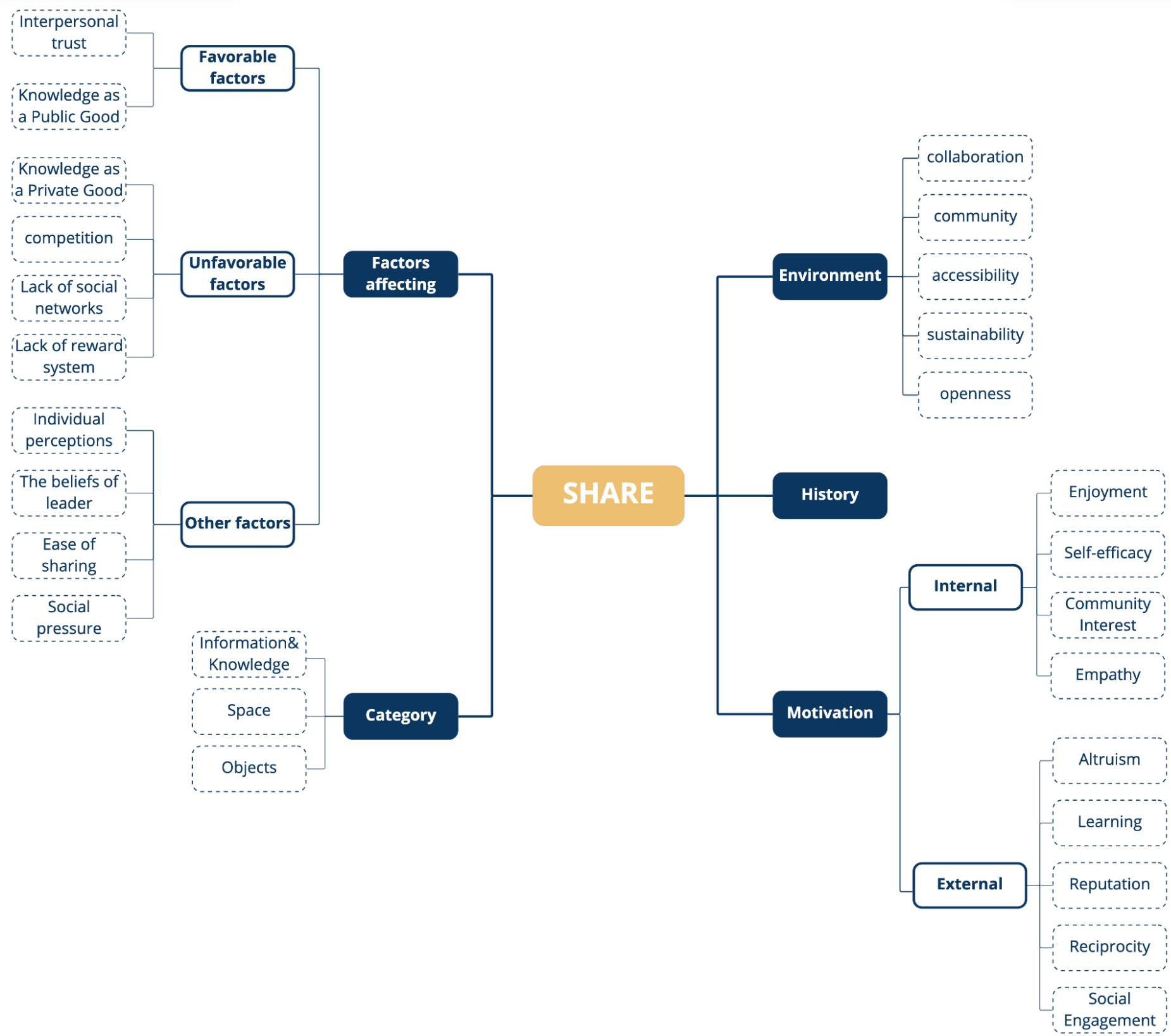
Co-working space characteristics
Kojo and Nenonen identified six types of co-working spaces based on the business model and level of user access, namely: public offices, third places, collaboration hubs, coworking hotels, incubators, and shared studios. In this study, only users of co-working hotels and shared studios and not public spaces such as third places, collaboration hubs or libraries are taken into account. The main focus of these public places is not to provide workspaces for co-workers and there is no rental contract. As this study aims to help co-working office providers to improve their competitive position, these public offices are not taken into account. Incubators are also not considered in this study because these are a very specific and mostly publicly funded type of multi-tenant office that focuses on supporting start-up enterprises.

Although there are several types of co-working spaces, they share the same core values, namely: collaboration, community, accessibility, sustainability and openness. Collaboration refers to working together with other co-workers. In addition, at a coworking space, because of its open-work environment, spontaneous interactions frequently occur between users. Sometimes a co-working host is assigned to create a good atmosphere and stimulate interaction, networking and collaboration between co-workers.

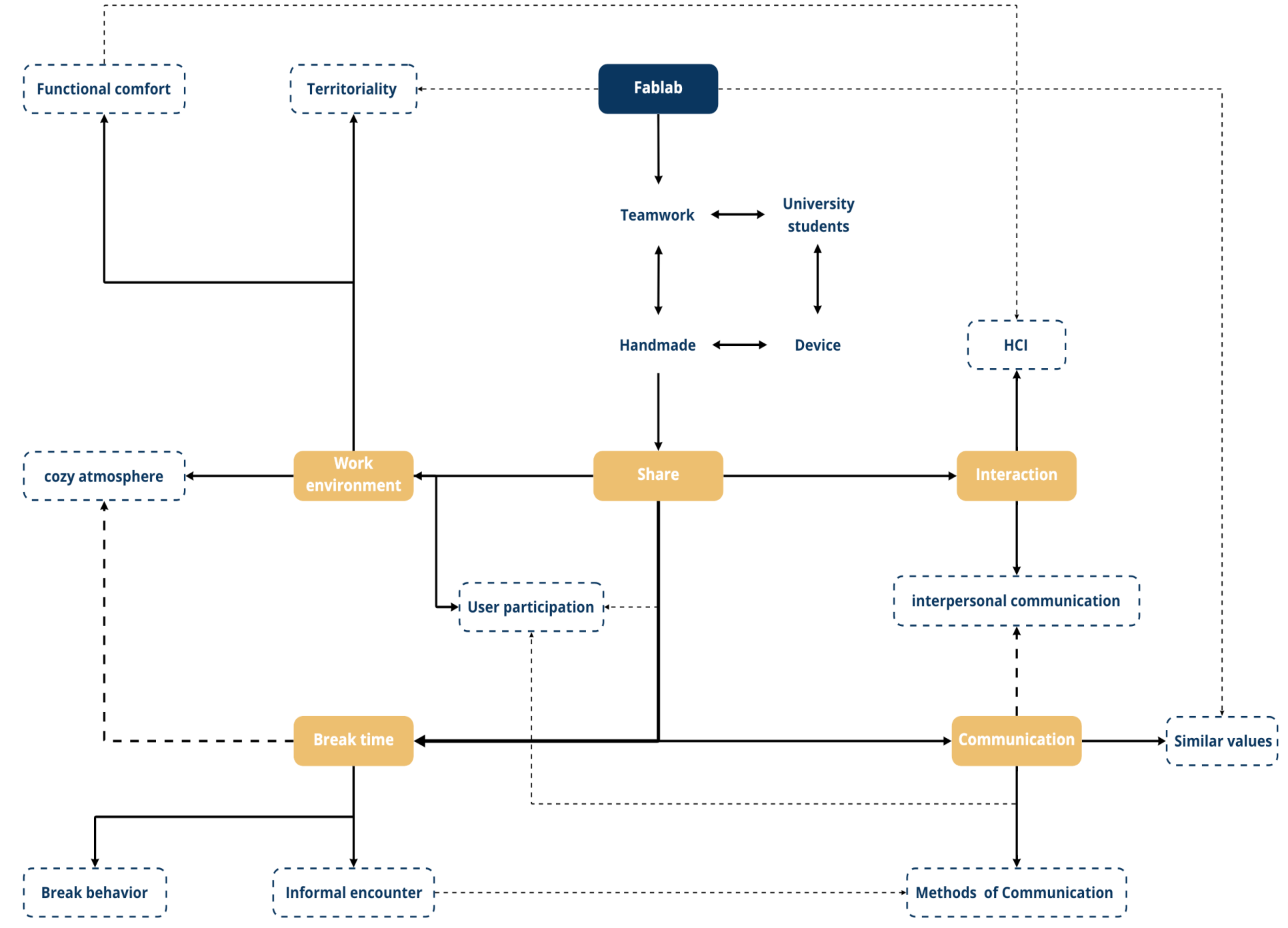
Furthermore, co-working spaces are community-driven environments where co-workers can improve themselves with the help of other co-workers. The main value of the community is that it is open and accessible to everyone. In this community, co-workers can find other people, ideas and other resources, share experiences, learn from each other and celebrate each other’s successes. Furthermore, several co-working space providers offer co-working space at multiple locations. Therefore, independent professionals have the flexibility to choose where to work. In addition, co-working spaces are accessible

because office space is mostly offered based on low rental prices and flexible rental contracts, such as a rental period for a day, a week or a month.
Having close contacts at work increases employee satisfaction. Besides the social aspect, sharing resources, skills, creativity, expertise and knowledge with each other is an important aspect of co-working. Therefore, it is interesting for future research to analyse which preferred aspect of co-working spaces actually stimulates the interaction between co-workers, eventually creating a community.

2.5 The diagram of bibliography



2.6 State of art



2.7 Case study

Fablab Barcelona

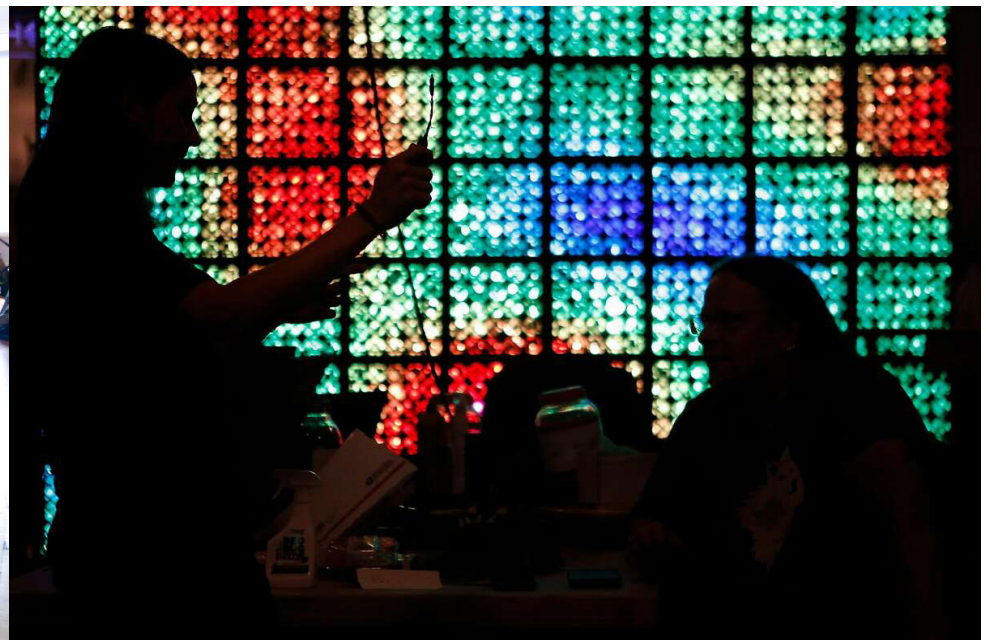
Fab Lab Barcelona is the first Fab Lab funded in the European Union in 2007, For research, education and innovation, use their digital manufacturing facilities to prototype, manufacture, and test these ideas in the real world. Including 18 European research projects since 2014.

- Incubation
- Mechanical work area
- Co-working area
- Open source product
- Commercial projects
- Qualification certification in coopereation with universities
- Launch new initiatives with other associations
- Commercial training

Fablab Veritas

The first international Fab Lab was established in Costa Rica. VERITAS is a pioneer in the professionalization of academic courses. The VERITAS community manages collaborative processes, co-creates and incubates multi-disciplinary design projects through 3 action areas: Educational,Comercial, Institutinal.

- Incubation
- Mechanical work area
- Co-working area
- Intellectual property library sharing **OMPI**/ professional consulting service **CATI**
- Courses in collaboration with universities



Noise bridge

Noisebridge is a fun space for sharing, creation, collaboration, research, development, mentoring, and of course, learning. Come visit, work, and use our equipment free.
Noisebridge is also more than a physical space; it's a community with roots in hackerspaces extending around the world.

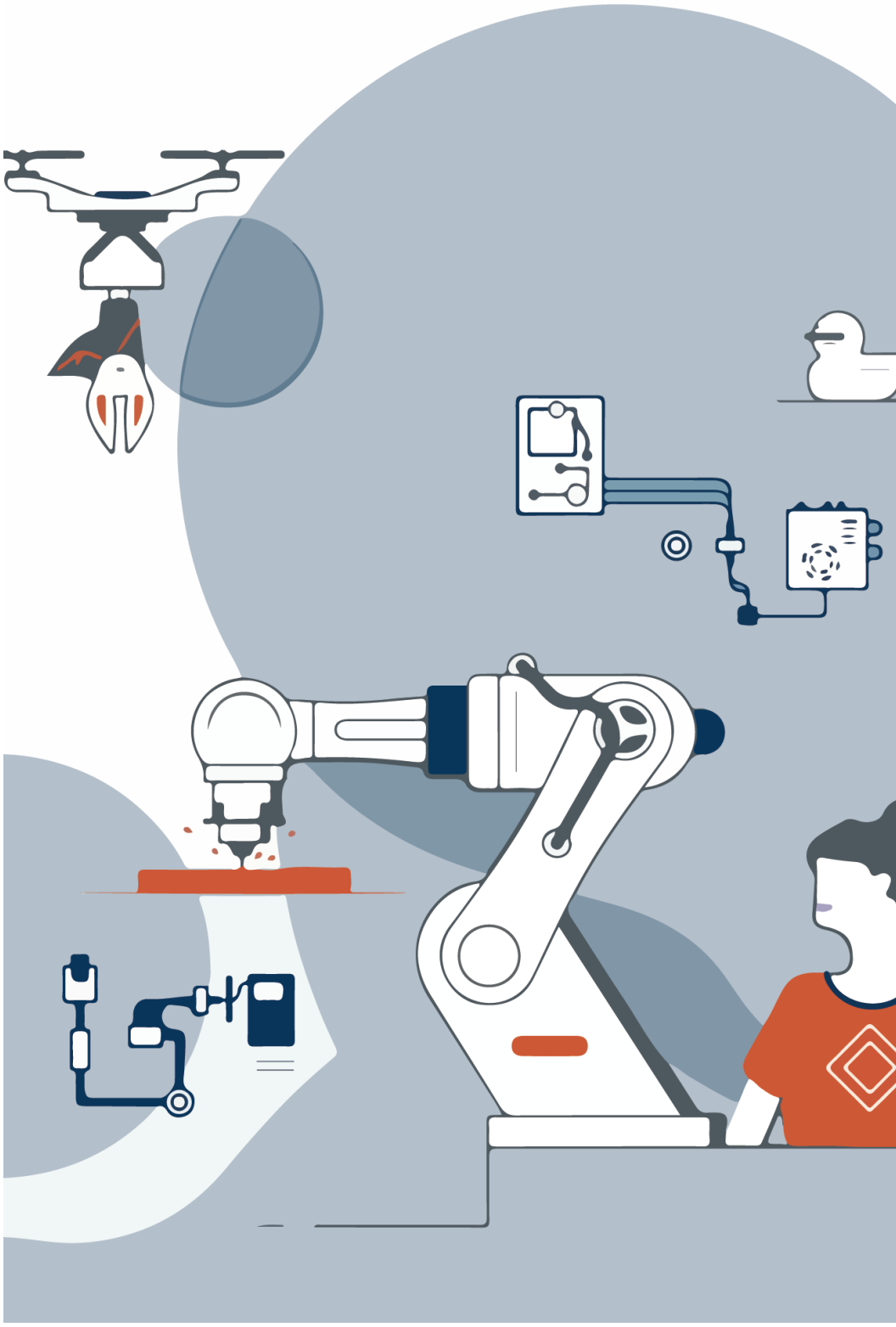
- Free
- Mechanical work area
- Joint work area
- Open Source Products
- Broader range of professions
- Great community culture

● General ● Advantage

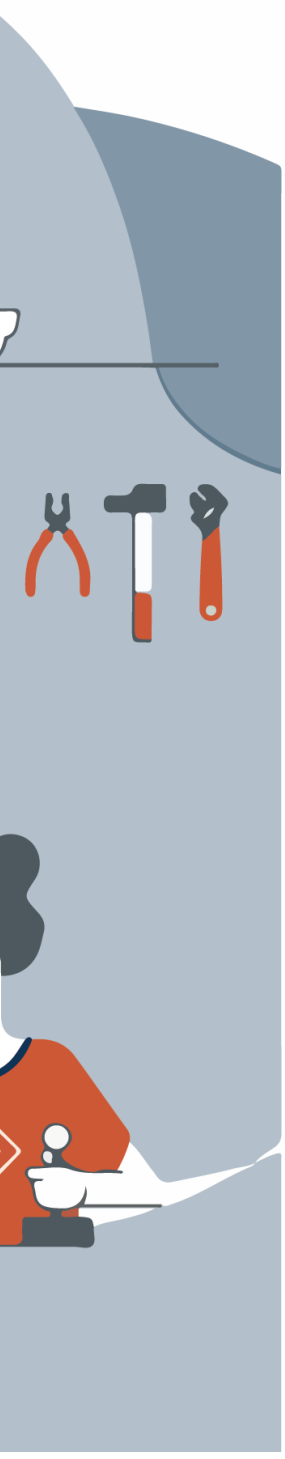
3. Concept

3.1 Brainstorm

In the early stages of the concept, we conducted a brainstorming session, which mainly included the initial idea of FABLAB establishment, the main activities within FABLAB, the problems and possible solutions found in the preliminary research, the main needs of users, what kind of FABLAB we want to create, etc.



FABLAB

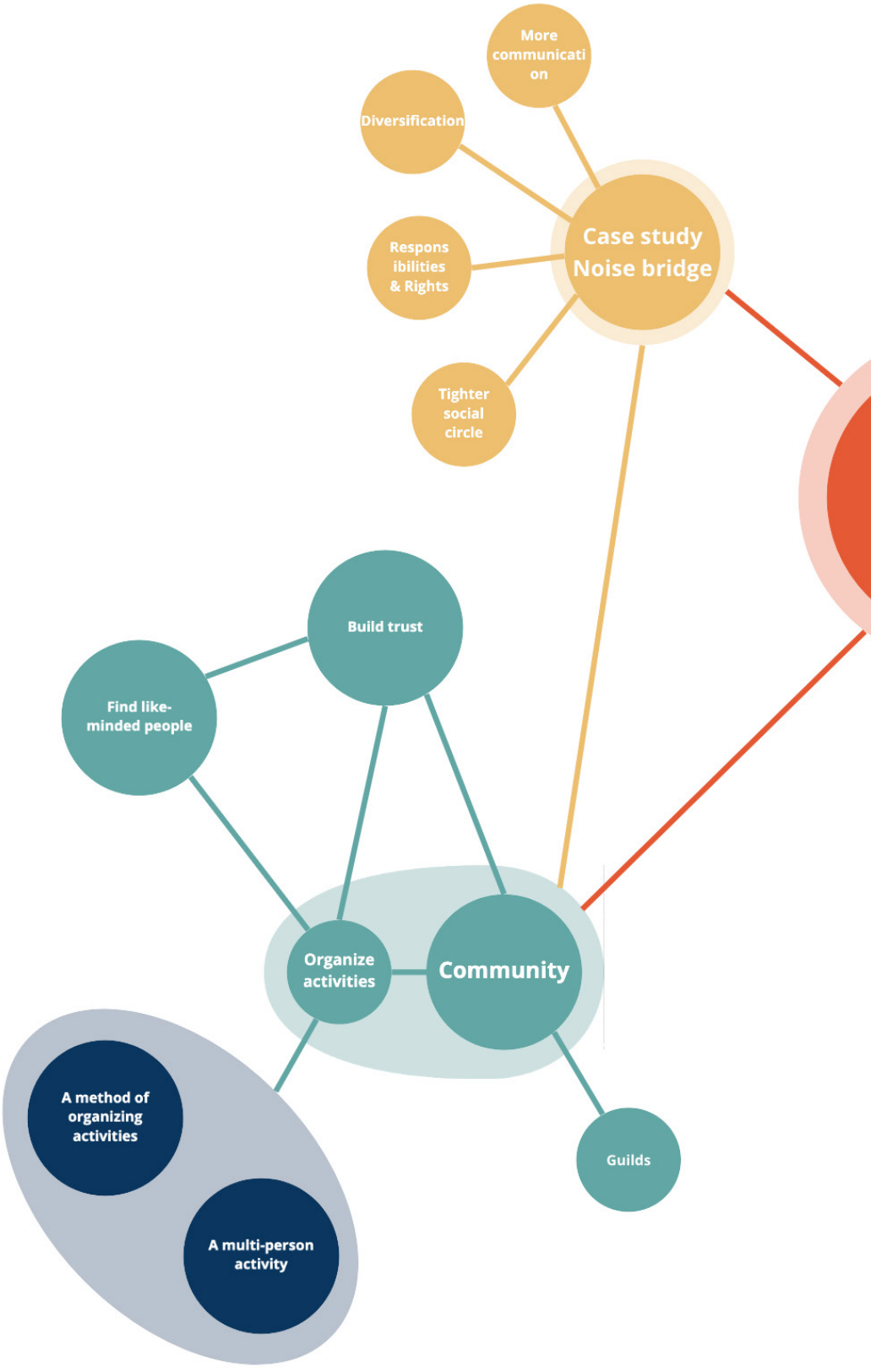


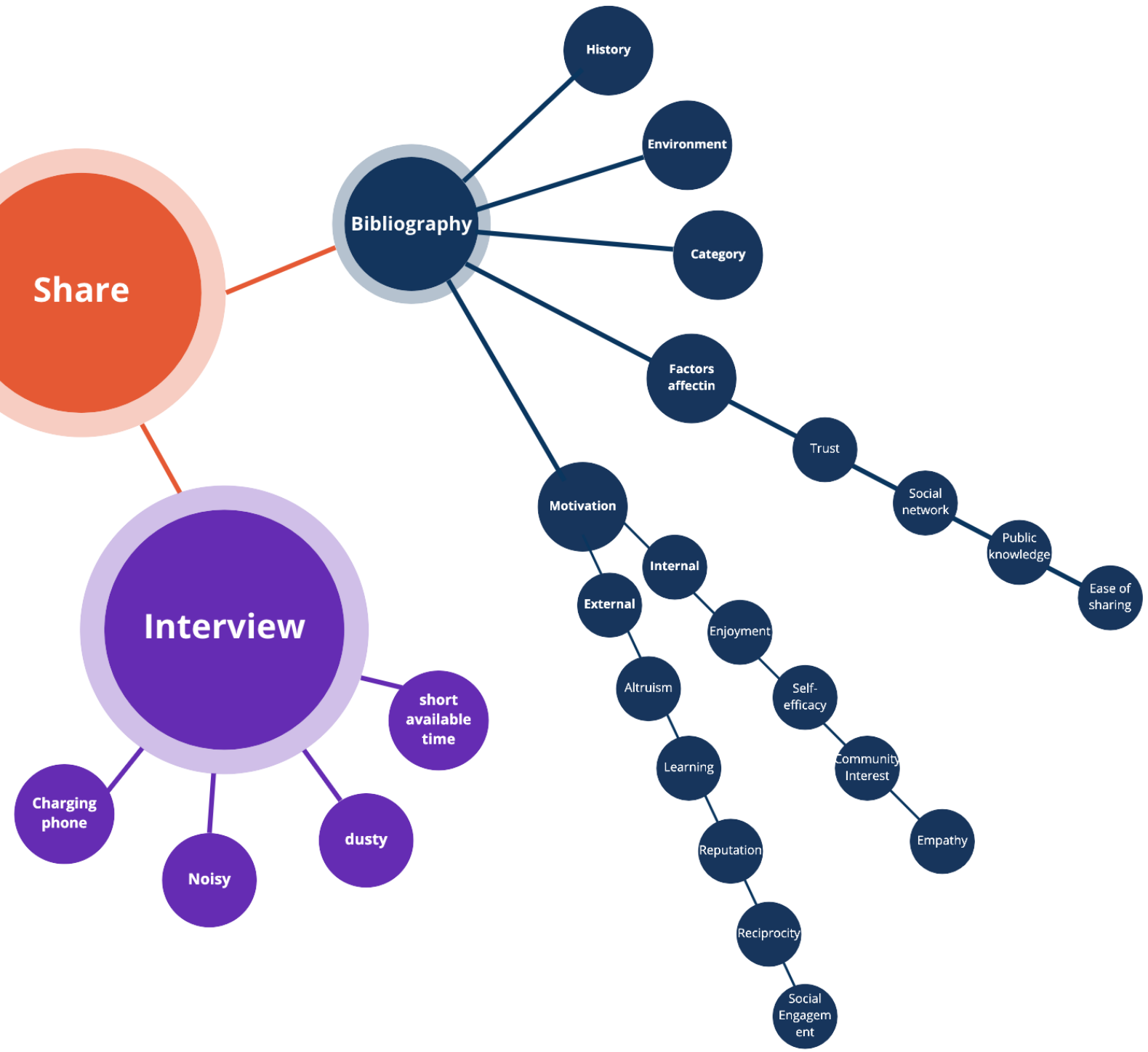
sustainability
communication
machines
incubation
arduino
global network
individual
practice
local
interactive
enjoyment
create
handwork
solution
social
share
non-profit
small team
co-working
recycling
new tecnology

3.2 Research summary

The user needs of fablab were identified through user interviews as the phone not being able to be charged, which made them have to leave before the phone was turned off. The resting environment is poor and can be affected by the noise from the laser cutting area. When resting they prefer to run to TOOLBOX because there are snacks and coffee and the environment is more comfortable. Combined with the preliminary research, in order to achieve the goal of facilitating user communication, we decided to start by improving the function and environment of the break area.

First we wanted to provide a tool to bring users together and create conditions for them to communicate with each other. Then to provide them with a more comfortable communication environment so that users would stop running away. In addition, to further facilitate communication between users, we needed to connect each user's behavior to the product so that each person could have an impact on those around them. But we need to be careful to always avoid forcing users to do things they don't like.




Share
Interview
short available time
Charging phone
Noisy
dusty
Bibliography
History
Environment
Category
Factors affectin
Motivation
Internal
External
Enjoyment
Altruism
Self-efficacy
Learning
Community Interest
Reputation
Empathy
Reciprocity
Social Engagement
Trust
Social network
Public knowledge
Ease of sharing

3.3 The concept

Through investigations and interviews, we found that the current Fablab torino community is not complete, especially in offline part. The lack of communication between users may be related to lack of motivation and desire to share. In addition, all the previous legacy seems to have completely disappeared, and users have no experience to learn from.

Now is the time to make a change. We want to build a more active community for Fablab torino, connect work and relax, and promote communication between users in a variety of ways.

There should be a device offline, which should gather users together, create a good communication environment, enhance the sense of social participation, and create favorable motives for sharing among users.

The project is designed to help fablabers organize activities, let them get together to communicate, find like-minded people, build trust with each other, and gain a closer social circle, which we hope to form some guilds in the future, and they will continue to attract other new users to join.

A social site that brings people together and creates a comfortable environment where they can interact face-to-face, get closer to each other and form a more intimate community culture.

3.4 Solution

To find a solution that responds to the defined concept and brings improvements in the daily life and sleep hygiene of users, it was necessary to ask some main questions and try to give answers to them.

WHY

Fablab's community atmosphere is not good enough, users are hard to get familiar with each other in a short time, and there is a lack of communication opportunities.

WHEN

Fablab was originally set up to build a knowledge base to enable sharing and communication, however, each FABLAB is different and FABLAB TORINO is open for 4 hours a day, and in this short time, we want to do our best to facilitate communication among users.

WH

By referring to the fi
FABLAB, the lounge
suitable area for use
and in order to avoi
the building walls, fu
tables are worthy pl
high frequency of us
comfortable user ex

eld research on
e area is the most
r communication,
d damage to
urniture such as
aces to use, with
se by people and
perience.

In order to will attract users around, the device needs to meet some needs of the users or be interesting enough, but it is not enough to bring users together, but also to focus their attention on each other.

ERE — WHAT — HOW

We want to solve these problems with a device that brings users together, creates a relaxing environment, and provides activities that involve all the users around them, thus increasing the chances of communication between them.

3.5 Function

In this phase, we envisioned how the product and its users would communicate with each other and how to facilitate the communication between them.

The first step was to bring users together by meeting their needs. Among the many needs, we chose the ability to charge the phone because it was the most urgent and relatively easy to satisfy. But at the same time, we needed to avoid users focusing on their phones, which would prevent them from communicating with each other. So the act of charging the phone needed to be linked to other features or other users. In addition, Fablab users need to go to TOOLBOX to buy coffee or mineral water during their break time, because there are no coffee machines or vending machines. Thinking about the traditional Italian and Chinese beverage culture, whether it is coffee, tea or other beverages that need to be heated, after some consideration we came up with the simplest solution to make a heating device and connect it to the act of charging the phone so that users can put down their phones, enjoy their coffee and chat with the people around them.

Then, we give feedback to the user through the light, on the one hand, it can show the working status of the machine, on the other hand, we hope to create a more comfortable atmosphere with warm and soft light to make the user more relaxed, which is also more conducive to their communication.

Finally, when the user puts down the phone and waits for the drink to heat up, we need to design a multi-person activity to include all the people around to achieve the purpose of mutual communication.

Interaction

Our original idea came from the original campfire, with a warm and relaxing environment, delicious food and people singing and dancing together. Combining all the preliminary research and the needs of Fablab users, "Campfire" was born.
"Bonfire" also takes into account emotional design and other interaction design guidelines, such as Gestures. Placing the phone on the charging pad and starting to charge it, with hands off the phone, was designed to allow the user to put the phone down and turn their attention to the people around them, while meeting their needs.

Lights.
Lights are designed to provide feedback to the user and can also influence the environment. The intensity of the lights can indicate the working status of the heater, and the lights can also create a happy campfire-like atmosphere, making it easier for users to communicate.

Activity
To fill the time spent waiting for a drink, and as an opportunity to further facilitate communication between users, a multi-participant game or activity is needed here.

Solution

The final solution was summarized as a heater that creates a pleasant atmosphere and provides phone charging capabilities, and offers a multiplayer game activity to be played while waiting for a phone to charge or a drink to be heated.

Main objectives

Charge the phone

Create a better breaktime environment

Promote communication between users

Details

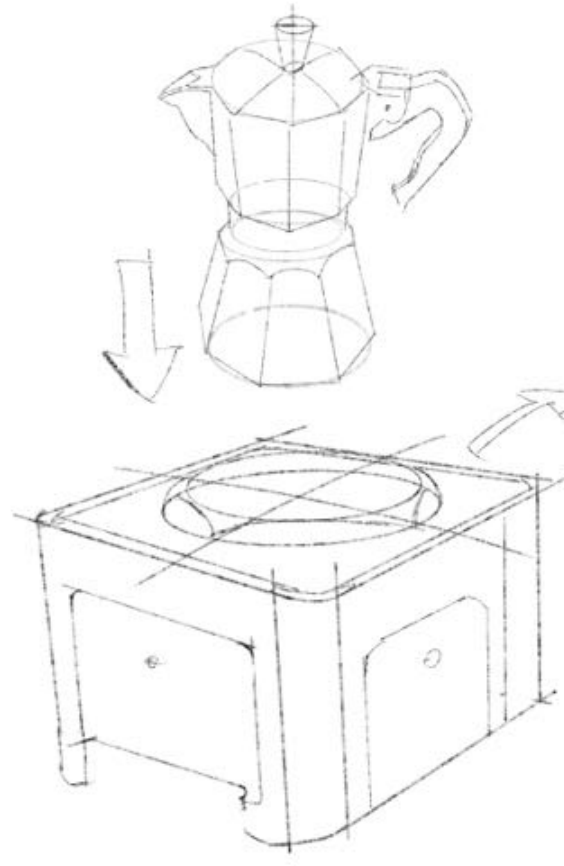
Charging device
The user flips the charging pad outward, places the phone on the charging pad, and the phone begins to charge. This is designed to allow the user to shift their attention from the phone to their surroundings.

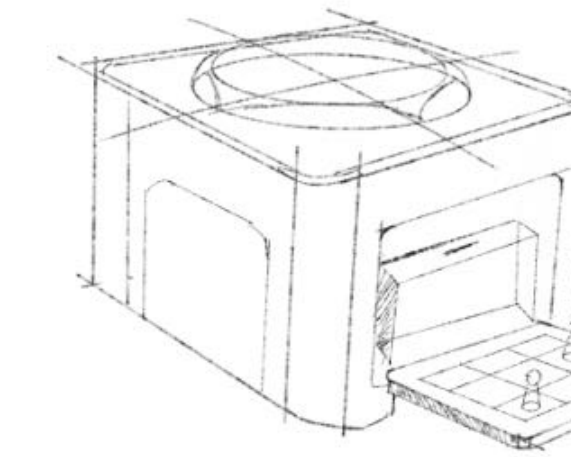
Heater and light
If the user wants to drink coffee or tea while taking a break, he/she needs to flip the switch, at which point the heater starts to heat up and is accompanied by a light that lights up (this action is not related to the phone charging). The light will give feedback to the user indicating that the heater is working and also simulate a campfire as a way to create a more relaxing environment and increase the user's desire to communicate.

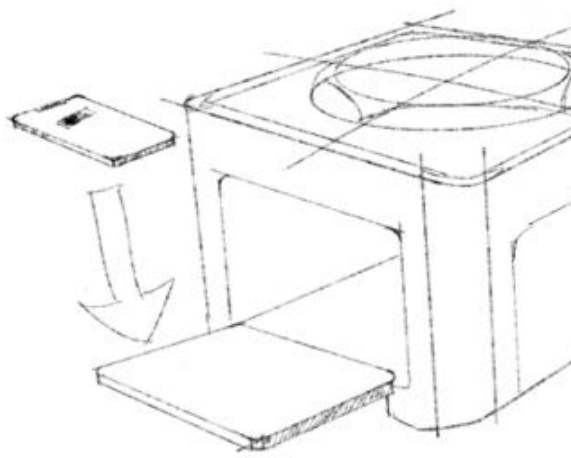
Games
The design criteria for the game were simplicity and fun. Overly complex rules would spoil the relaxing environment, while too boring a game would not attract enough players. In the end, we chose a traditional and simple board game, but with some changes. The rules of the game were that the player with three pieces of the same color and the same size on a horizontal, vertical or diagonal line wins.

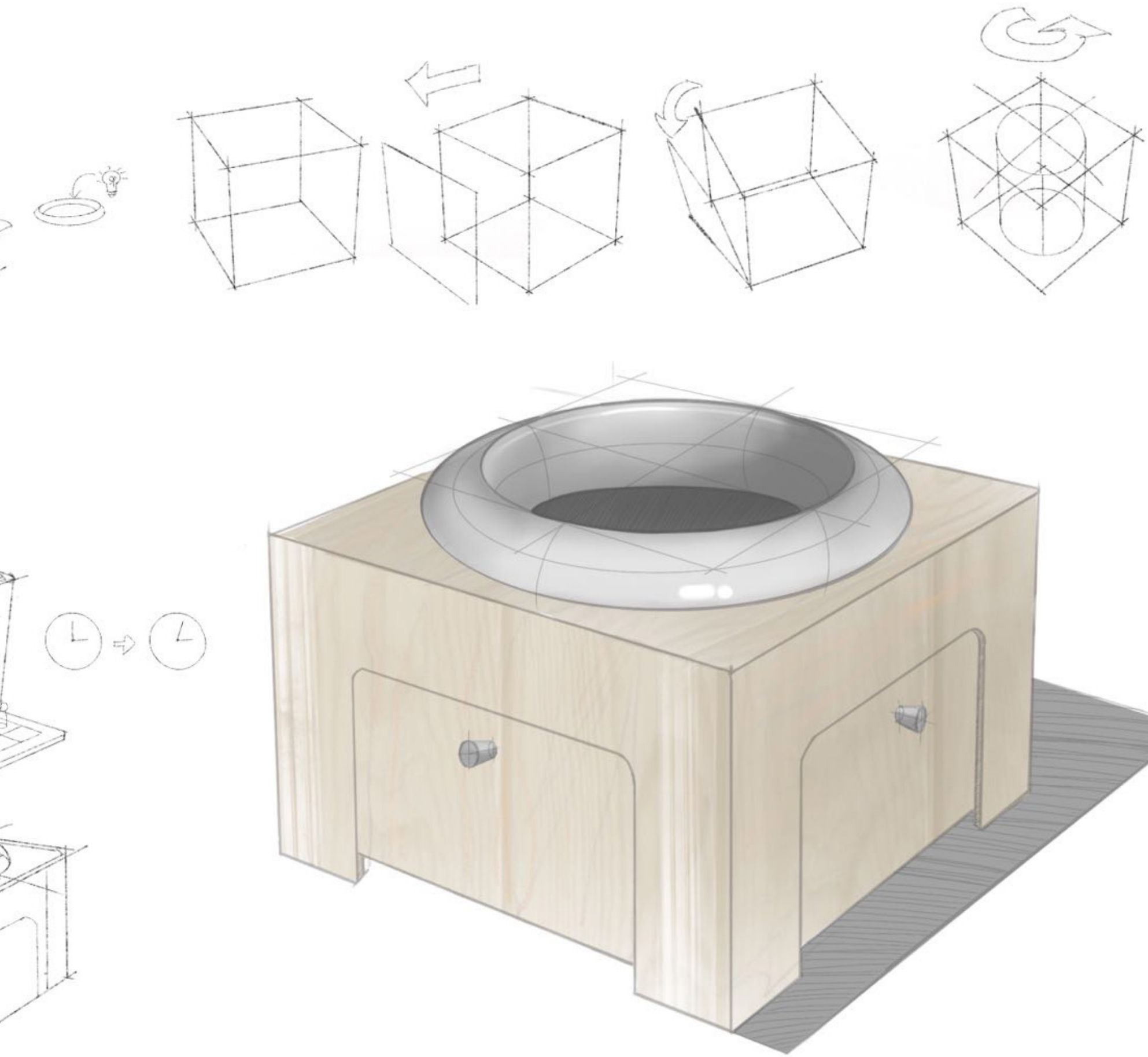
3.6 Sketches

There is still a distance between idea and implementation, and sketching is a good link to move forward. First, after research, we decided to put our product on a table or wall in the lounge area. Considering that the fixture might cause damage to the wall, we chose to put it on a table, but we didn't want it to take up too much space.
This object needs to have more than one wireless charging pad so as to draw more people with charging needs together, but at the same time it needs to save space, so a reversible charging pad is a good choice. As the phone needs to be placed on a stable plane, remove unnecessary decoration, this product may be a cube, will be surrounded by four sides of the design can be reversible charging plate. A cup or jug filled with liquid can only be placed horizontally from top to bottom, so the entrance to the heater is on top. Finally, don't forget to leave enough space for the game, so we had to give up a charging device to meet the demand.









4. Design

4.1 Name

Bonfire

Our original idea came from the bonfire, warm and relaxing environment, delicious food and people singing and dancing together.

Combined with all the previous research and the needs of Fablab users, “Bonfire” was born.

4.2 Material

For the main material of the project, it needed to be analyzed from different perspectives. We evaluated four aspects: cost, technical feasibility, sustainability and usability. We finally decided to use wood as the main material, but due to functional requirements, such as the need to use translucent materials for lighting, this project will still use a small amount of other materials.

Material	Cost	Technical feasibility	Sustaubability	Usability	Total
Wood	7	9	9	10	9.2
Paper	10	10	9	6	8.2
Plastic	8	9	6	10	8.3
Iron	5	5	6	10	6.5

4.3 Components

8 x A4,3 x A3 Pannelli In Legno Compensato Betulla

Package dimensions: 29.8 x 21.1 x 3.1 cm;
Item weight: 130g;

Price: 28.8€

1 x Burner for Milk Water Coffee Heating (US Plug 110V)

Voltage: 110V
Power: 500W
Product Size: 135*100*75 mm
Package Weight: 750g

Price: 14.9€

3mm PC Polycarbonate for 3D Printers, Transparent

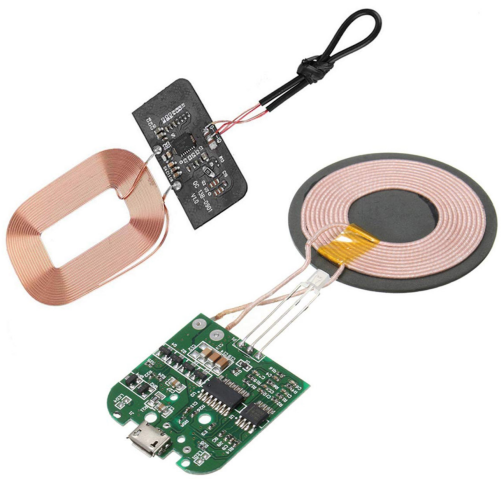
Material : Polycarbonate;
Color : Clear;
Item Weight : 1kg;
Item Diameter : 2.85mm;

Price: 20€

Led 12V Light Nature 3000K IP20

Product dimensions : 500 x 0.8 x 0.2 cm; 60 g;
Energy consumption class (EU) A +;
Luminous : flux 2300 lm
Power : 16 watts;
Bulb power included : 24 Watt;
Color temperature : 3000 Kelvin;
Average life of the bulb included 50000 Hours

Price: 2.9€



3 x Wireless Charger, Compatible with All QI Device Charging

Package dimensions: 29.8 x 21.1 x 3.1 cm;
Item weight: 130g;

Price: 21€

16.4Ft 500C High Temperature Glass Fiber Cover Wire Cable

Length: 5M / 16.4Ft
wire section area: 1mm2
Max. Temperature resistant: 500 ° C
Material: Fiberglass, copper
White color
Net Weight: 76g

.Price: 3.49€

17 x Small Round Disc Magnets - Silver

Dimensions:
5 x 1 mm;
Colour : Silver
Shape : Round

Price: 1.34€

1 x Universal Travel Adapter with 3 USB

Universal Travel Adapter, International Adapter with 3 USB, International AC Socket
Universal travel adapter can be used in more than 224 countries, such as USA, UK, EU, AUS, CAN, JPN, GER, IT, CN, most of Asian countries, but with EXCEPTION such as South Africa and India.
Universal Travel Adapter Rated AC power: Max. Load 6A / 100-240V AC, 50 / 60Hz. Powerful up to 660W at 110V, 1440W at 240V.

Price: 22€

3 x Micro USB cable

Size 1M
Compatible devices Gaming console, Tablet, TV, Smartphone
EAN 0751433278091, 0751433726394
CE fulfilled specification
USB connectivity technology
Micro-USB connection type

Price: 15€

SPST ON-OFF 15A / 250V toggle switch

Mounting type: Snap-on
Brand: Aerzetix
Voltage: 250 Volts
Nominal current: 15 Ampere
Lift type: On-off

Price: 6.5€

4.4 Costs

The total cost is

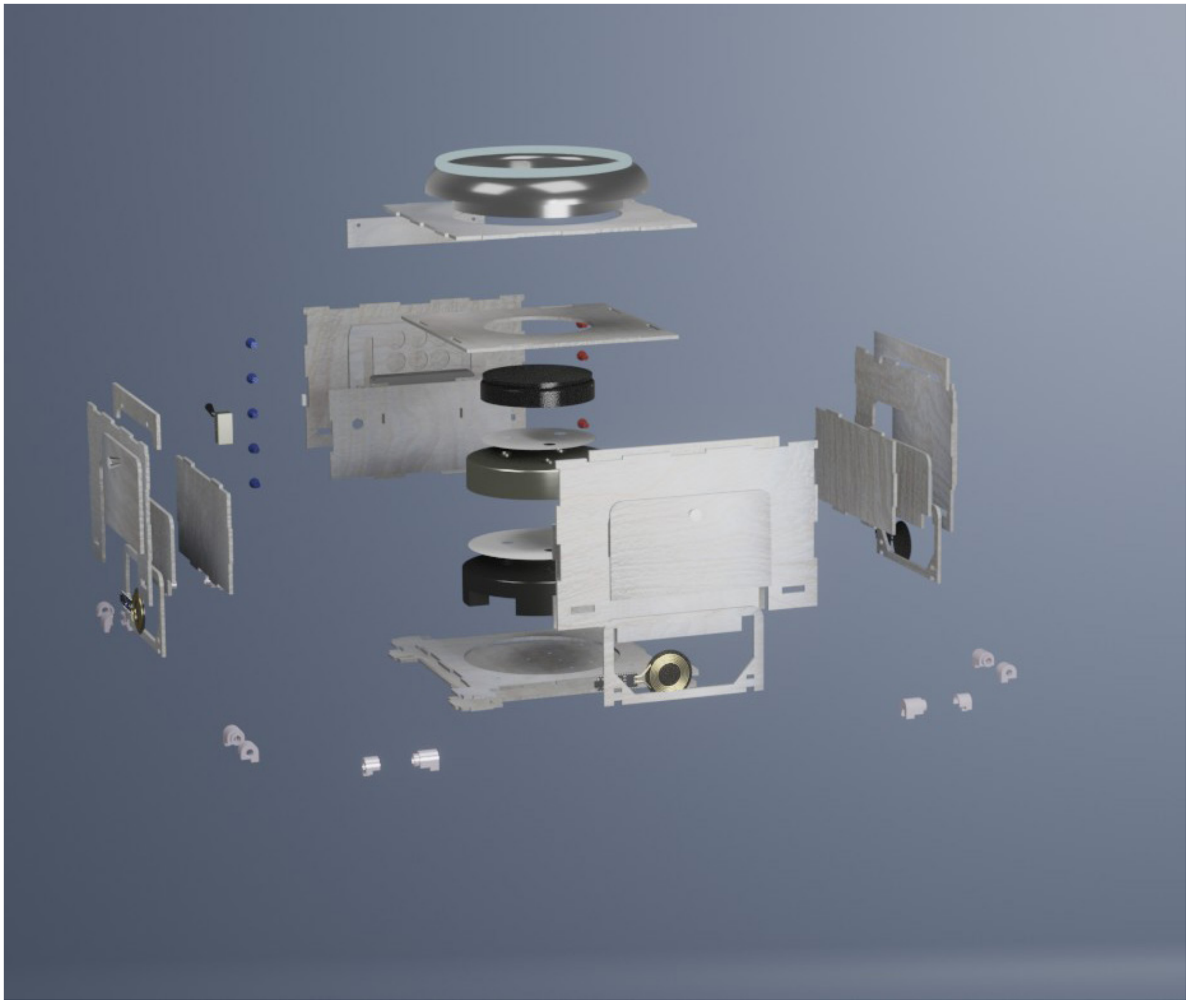
135.93 € for the components

45 € for the use of the machine

180.93 € of total.

4.5 Render

4.6 Exploration



4.7 Prototype

During the creation of the prototype the main objective (and, actually, also the main difficulty) was the realization of an object that could reach the most fidelity to the physical characteristics of the final product, primarily to ensure that everything would work as intended.

PC was chosen as the filament material for 3D printing due to the specific need of light transmission and maximum resistance to high temperatures.

PC
Polycarbonate is a colorless, transparent, unqualified thermoplastic material. Its name comes from its internal CO3 group.

Properties
Density: 1.2 g/m^3
Available temperature: -100 °C to +180 °C
Heat deflection temperature: 135 °C
Melting point: about 250 °C
Flexibility: 1.585 ± 0.001
Light transmittance: 90% ± 1%
Thermal conductivity: 0.19 W/mK
Linear expansion rate: 3.8 × 10-5 cm/cm °C

Chemical Properties
Polycarbonate, resistant to acid, not resistant to oil, not resistant to ultraviolet light, not resistant to strong alkali.

Physical properties
Polycarbonate is colorless and transparent, heat resistant, impact resistant, flame retardant, and has good mechanical properties within ordinary use temperatures. Compared with polymethyl methacrylate, which has similar properties, polycarbonate has good impact resistance, high refractive index, good processability, and UL94 V-2 level flame retardant properties without additives. However, polymethyl methacrylate is less expensive and can be produced in large devices by ontogenic polymerization. With the increasing scale of polycarbonate production, the price difference between polycarbonate and polymethyl methacrylate is shrinking.

Polycarbonate burning will emit pyrolysis gas, plastic scorching and blistering, but not on fire, away from the fire source that is extinguished, emitting a thin phenol odor, the flame is yellow, luminous light black, the temperature of 140 °C began to soften, 220 °C melting, can absorb infrared spectrum.

Poor wear resistance of polycarbonate. Some of the polycarbonate devices used for easy wear purposes require special treatment of the surface.

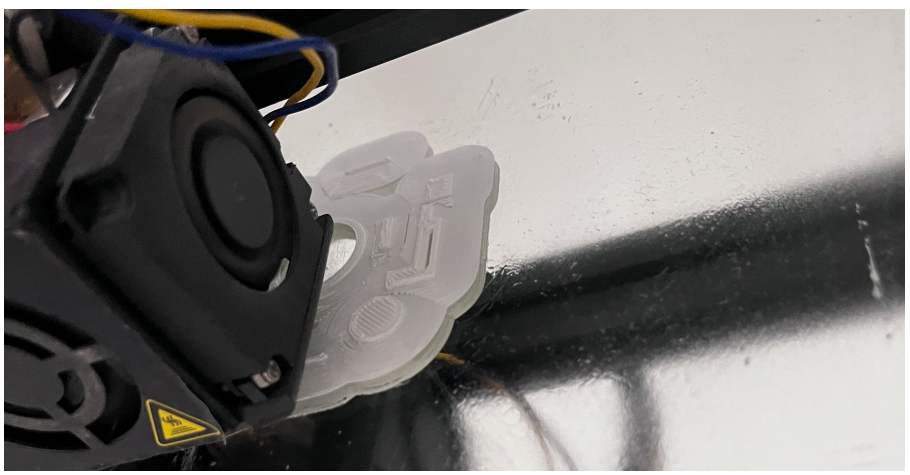
As for other plastic parts including spindles as well as chess pieces, there are no special requirements for physical and chemical properties, only the selection of material needs to be considered in terms of production process as well as cost. What needs to be determined is that each single part is easy to produce (print) even among non-expert users and the final product will be easy to build and disassemble to ensure easy maintenance, PLA material can meet all requirements.

PLA

Polylactic acid, also known as poly(lactic acid) or polylactide (PLA), is a thermoplastic polyester with backbone formula (C 3H4O2)n or [–C(CH3)HC(=O)O–]n, formally obtained by condensation of lactic acid C(CH3)(OH)HCOOH with loss of water (hence its name). It can also be prepared by ring-opening polymerization of lactide [–C(CH3)HC(=O)O–]2, the cyclic dimer of the basic repeating unit.

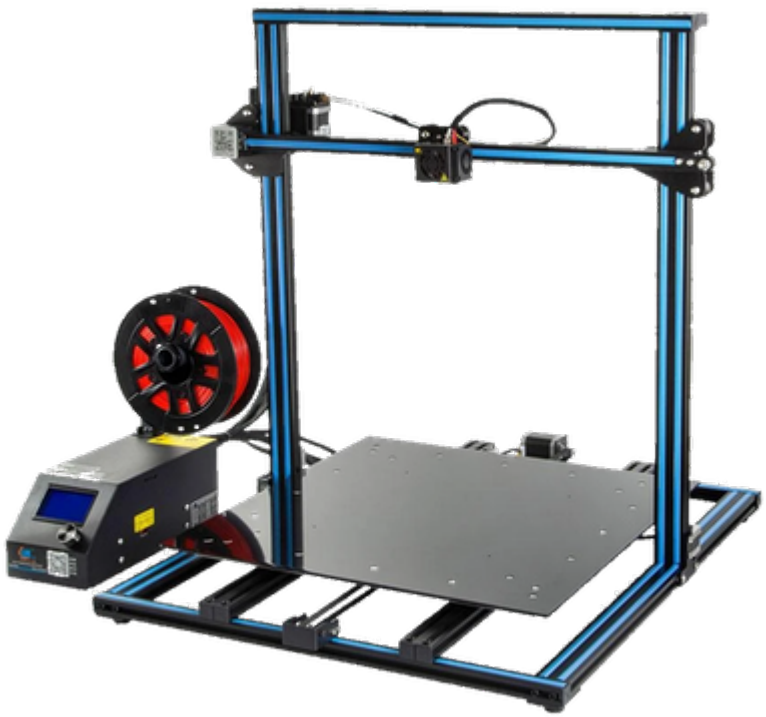
PLA polymers range from amorphous glassy polymer to semi-crystalline and highly crystalline polymer with a glass transition 60–65 °C, a melting temperature 130-180°C, and a Young's modulus 2.7–16GPa. Heat-resistant PLA can withstand temperatures of 110 °C. The basic mechanical properties of PLA are between those of polystyrene and PET. The melting temperature of PLLA can be increased by 40–50°C and its heat deflection temperature can be increased from approximately 60 °C to up to 190 °C by physically blending the polymer with PDLA (poly-D-lactide). PDLA and PLLA form a highly regular stereocomplex with increased crystallinity. The temperature stability is maximised when a 1:1 blend is used, but even at lower concentrations of 3–10% of PDLA, there is still a substantial improvement. In the latter case, PDLA acts as a nucleating agent, thereby increasing the crystallization rate. Biodegradation of PDLA is slower than for PLA due to the higher crystallinity of PDLA[citation needed]. The flexural modulus of PLA is higher than polystyrene and PLA has good heat sealability.

https://en.wikipedia.org/wiki/Polylactic_acid



3D Printer

With 3D printing we mean the creation of three-dimensional objects by additive manufacturing, starting from a digital 3D model. 3D printers uses different technologies for production, the most common is FDM (Fused Deposition Modeling) technology. This technology works on an “additive” principle by releasing the material layer over layer. A thermoplastic filament is unwound from a spool, which supplies the material to an extrusion nozzle, which is heated to melt the material and can be guided both horizontally and vertically by a numerically controlled mechanism.



3D printer Creality CR-10 S

Application

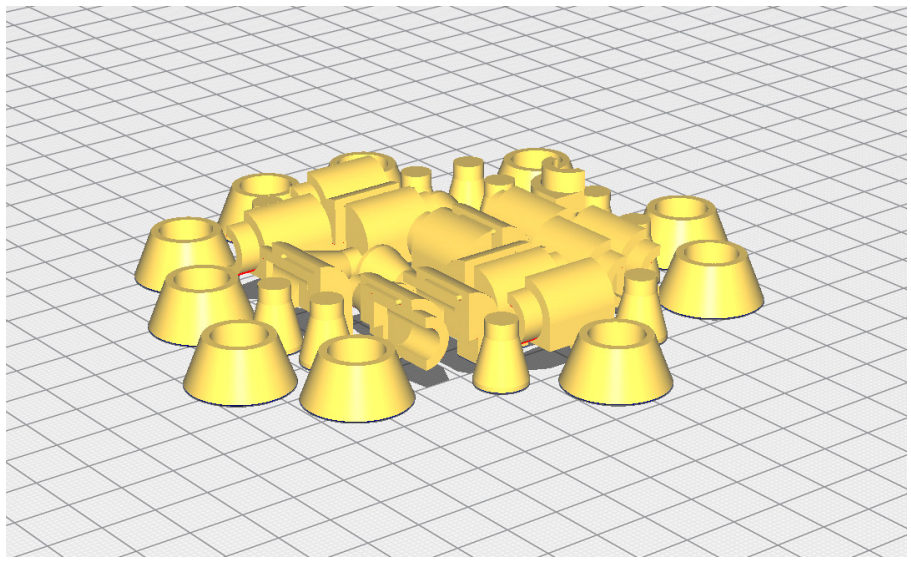
The 3D printing technology allows you to efficiently create unique pieces and extremely complex geometries, not achievable otherwise. For this reason, its applications are many and continuously growing, from the creation of prototypes, customized medical prostheses and orthoses, but also used in the most diverse industrial sectors: aerospace, automotive, food, construction, medical and biomedical sectors.

Depending on the type of 3D printing technology, the usable materials also change. With FDM technology it is possible to process thermoplastic polymers (PLA, ABS, Nylon, PETG, PVA), thermoplastic (TPU), polymeric (PEEK, PEI), but also composite materials consisting of a polymeric matrix and loaded with fibers or with metal filler (these require a post sintering process in which the thermoplastic matrix evaporates leaving only the metal parts).

Technical features Values	
Maximum print size	300 x 300 x 400 mm
Mounted nozzle	0.4 mm
Thickness of the layer	0.1 - 0.32 mm
Printing accuracy	+-0.1 mm
Filament diameter	1.75 mm
Maximum plate temperature	100 ℃
Maximum nozzle temperature	250 ℃
Maximum print speed	180 mm / s

The parameter settings of the 3D printer are particularly important and need to be changed depending on the print wire, including the selection of the correct printer model, nozzle size, print speed, nozzle and panel temperature, fan speed, choice of build plate adhesion, whether to support it or not, etc. In addition, the placement of the model will also affect the success of the print, you need to make the print parts and the panel as far as possible, and horizontal contact; the distance between each part needs to be controlled at about 2mm, to ensure the quality of the premise to avoid wasting material.

When 3D printing is carried out, the existence of printing errors needs to be considered in advance, and the interfaces of mutually occluding parts need to be reserved for a certain space, which can greatly reduce the workload of manual grinding later. It is recommended to 3D print one or a small number of parts for the first time, check the quality to meet the standard, and then print a large number of parts, which can save a lot of time and materials.



About the operation of the printer itself also need to pay attention to some matters, in order to make the printed parts and the panel fixed firmly enough, you need to spray the hairspray evenly on the panel before printing, but avoid spraying on the nozzle to avoid damage. Check the distance between the nozzle and the panel before printing to make sure that the lines sprayed from the nozzle can be firmly stuck together. When replacing the wire, the nozzle needs to be heated beforehand to prevent the wire from breaking in the conduit and requiring disassembly for repair.

Laser Cutter

The Laser Cutter its a numerical control machine that moves a laser beam over a surface in order to cut it or mark it.

Application

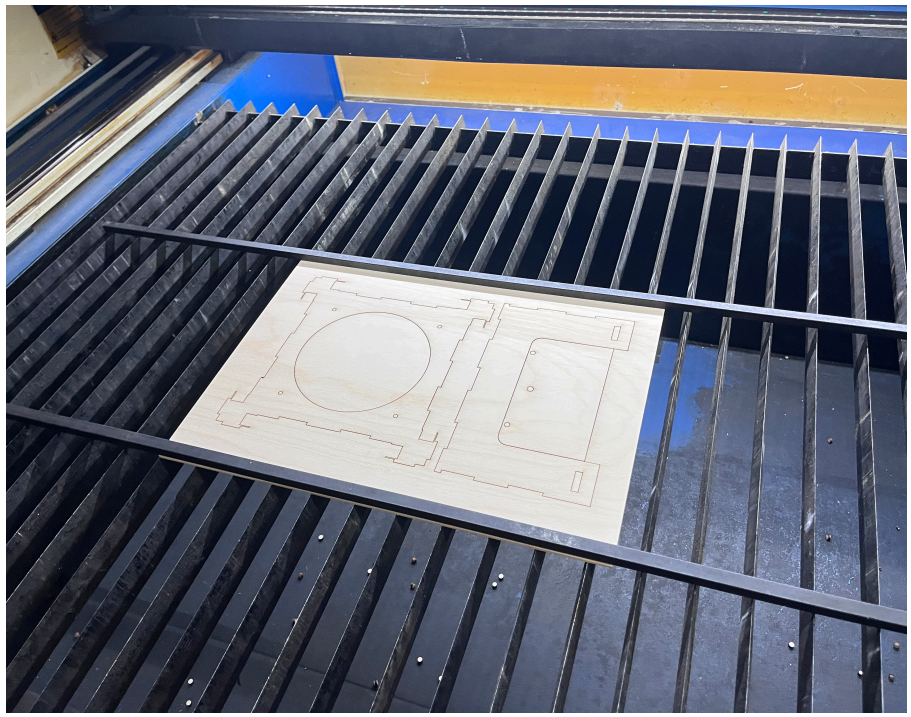
Laser cut is widely use in industrial enviroment thanks to its precision and its low cost in operation.

Most common materials can be used with the laser cut technology, for examples metals, plastics, fabric and leather, wood, paper, glass.

Laser cutting is a technology that uses a laser to vaporize materials, resulting in a cut edge. While typically used for industrial manufacturing applications, it is now used by schools, small businesses, architecture, and hobbyists. Laser cutting works by directing the output of a high-power laser most commonly through optics. The laser optics and CNC (computer numerical control) are used to direct the laser beam to the material. A commercial laser for cutting materials uses a motion control system to follow a CNC or G-code of the pattern to be cut onto the material. The focused laser beam is directed at the material, which then either melts, burns, vaporizes away, or is blown away by a jet of gas, leaving an edge with a high-quality surface finish.

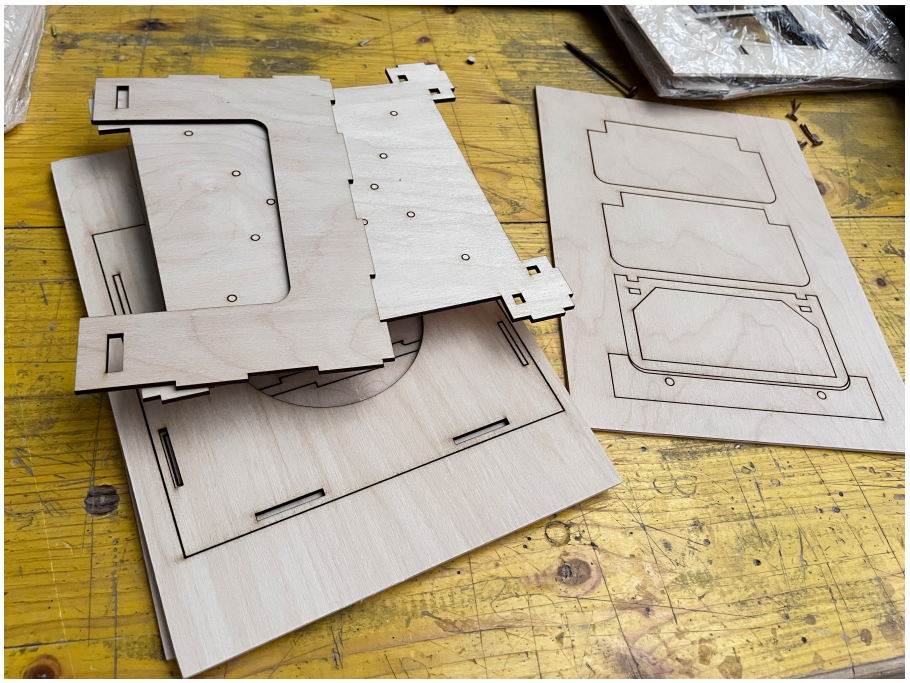
Laser Cutter CO2 WL1290

Fablab Laser Cutter Specs	Values
Power	130 W
Max speed of cut	200 mm/sec
Focal spot dimension	0,2 mm
Graphical resolution	0,0254 mm
Max material thickness	10 mm
Cutting area max dimension	1200x900 mm



Laser beam is generally focused using a high-quality lens on the work zone. The quality of the beam has a direct impact on the focused spot size. Depending upon material thickness, kerf widths as small as 0.004 inches (0.10 mm) are possible. In order to be able to start cutting from somewhere other than the edge, a pierce is done before every cut. Piercing usually involves a high-power pulsed laser beam which slowly makes a hole in the material, taking around 5–15 seconds for 0.5-inch-thick (13 mm) stainless steel, for example.

Since the process of making Bonfire does not require complex engraving, it is only necessary to adjust the parameters to the case provided by Fablab when operating the laser cutter.
Bonfire uses 3mm thick wood plywood, and in order to avoid deformation due to pressure, the bottom is fixed with a double layer of wood and glue. Each board bites into each other and is fixed with a tongue-and-groove structure.
It is necessary to pay attention to control the distance between each part to avoid damage to the parts by cutting and waste of materials.



4.8 Open source

Originally, Open Source referred to open source software (OSS). Open source software is code designed to be accessible to everyone: everyone can see it, modify it and distribute it according to their needs. Thanks to a collaborative approach, it is developed by communities. This approach is cheap, flexible and long-lived compared to proprietary software.
Today, Open Source refers to its development or distribution model. Open Source has become a production model with open values, constantly searching for new formulas. Open source software is made so by the licence for which the rights holders encourage the modification, study, use and redistribution of the source code. The main feature of open source licences is the publication of the source code. This phenomenon has developed greatly thanks to the Internet.
In summary, Open Source has 3 key concepts:

• free access to the source file;

• free modification and redistribution of the source file;

• high degree of cooperation between communities.
In an Open Source perspective, the source code is generally free and is accompanied by one or more services that implement the basic software or hardware for a fee. The Open Source perspective allows you to create materials from your own computer and share them; or access a factory file and self-produce it or have it produced.

FREE ACCESS TO THE SOURCE FILE

For the purposes of this project, the source code involves 3D models, materials, components and wiring diagrams. These materials are completely free and can be freely downloaded and discussed in the forum.
Bonfire is an interesting attempt, created initially, to promote the FABLAB torino community, and the blueprint for the future is to focus on enhancing the atmosphere of the various different communities, Bonfire will form its own community and, at the same time, it serves other communities.

FREE MODIFICATION AND REDISTRIBUTION OF THE SOURCE FILE

Each user is free to modify the source file as he or she wishes in order to encourage customisation and in some cases even the creation of upgrades for the project itself (which can be shared with the community).
In the Open Source perspective, the object can be made autonomously and if it should be damaged or break irreversibly, the producer is able to repair it, replacing the damaged parts. In addition, you are part of a community that is actively engaged and eager to help each other. Products developed by a community are more likely to be accepted by it.
All this reasoning corresponds to the absence of planned obsolescence: if people want to give new life to older products, they can do so and are completely free to do so.

HIGH DEGREE OF COOPERATION

The purpose of the network created around Bonfire is to form a community of enthusiasts, experts or people interested in the subject of self-publishing, as well as sharing opinions, ideas, skills and knowledge that can improve the project.
This network is made up of amateurs and professionals who make it possible to open up the innovation of the project. In fact, there are people in the open source community who create ideas for their own needs and tend to publish them, both for development and for help and advice.
What makes communities work is the love and passion for the same thing, the tendency for people to engage and bond with others as they do with networks. Thus, it is the community that provides the innovation.

CC BY-NC-SA

"Permits distribution, modification, and creation of derivative works from the original, but not for commercial purposes, provided that an appropriate mention of authorship is: acknowledged; a link to the licence is provided and it is indicated if modifications have been made; and the new work is given the same licence as the original (so any derivative work will not be allowed commercial use)."

For the Libra project, the licence “CC BY-NC-SA” has been chosen.

5. Project

5.1 Persona

Based on the survey of these users, we created two fictitious characters to represent the types of users who may have a similar experience in Fablab torino. Creating “Persona” will help us better understand user needs, experiences, behaviors, and goals. To achieve the goal of creating a good user experience for the target user group.

Ellen

AGE: 29

PROFESSION: Artist

CITY: Lives in Turin but born in Roma

HOBBIES: Like to paint in nature, participate in exhibitions

Problems encountered in Fablab Torino: She thinks it’s a bit boring to work here alone. As someone who has just arrived in this city, she wants to make some friends and share the difficulties and happiness with them

GOALS: Meet some interesting people here, they can work together, have fun together, and even become friends in life

“I would love to participate in some interesting activities and meet some people with the same hobbies, but I don't know how to find them.”

Sofia

AGE: 22

PROFESSION: Design student of PoliTO

CITY: Study in Turin, born in Collegno

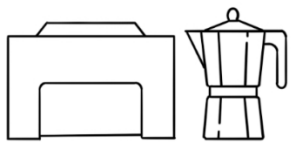
HOBBIES: Like watching movies and making handmade accessories

Problems encountered in Fablab Torino: She is a bit shy and never talked with anyone other than her teammates, when they encounter problems involving other professions, their work will stagnate. This is somewhat different from the diversified environment she imagined before

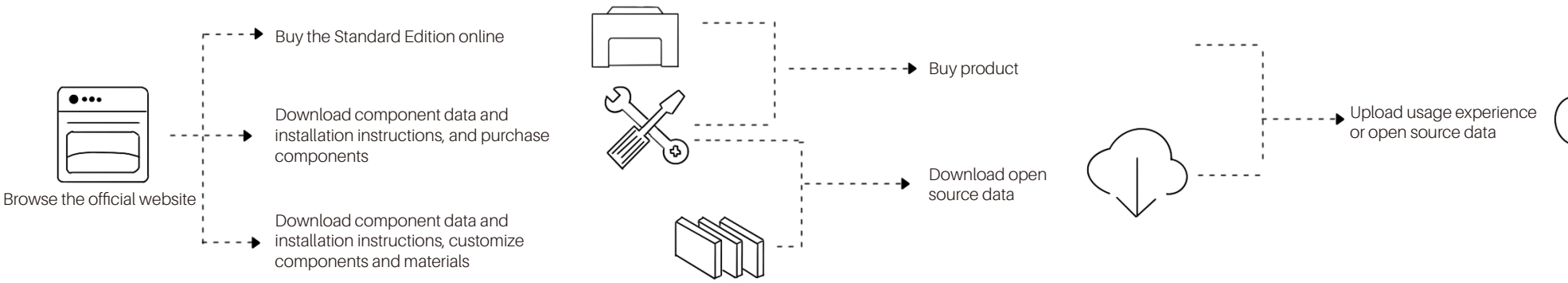
GOALS: She wants to meet more people of different professions and work or study with them

“For me, this is more like a good workshop or classroom. My teammates and I come here just to do some manual work and complete the course.”

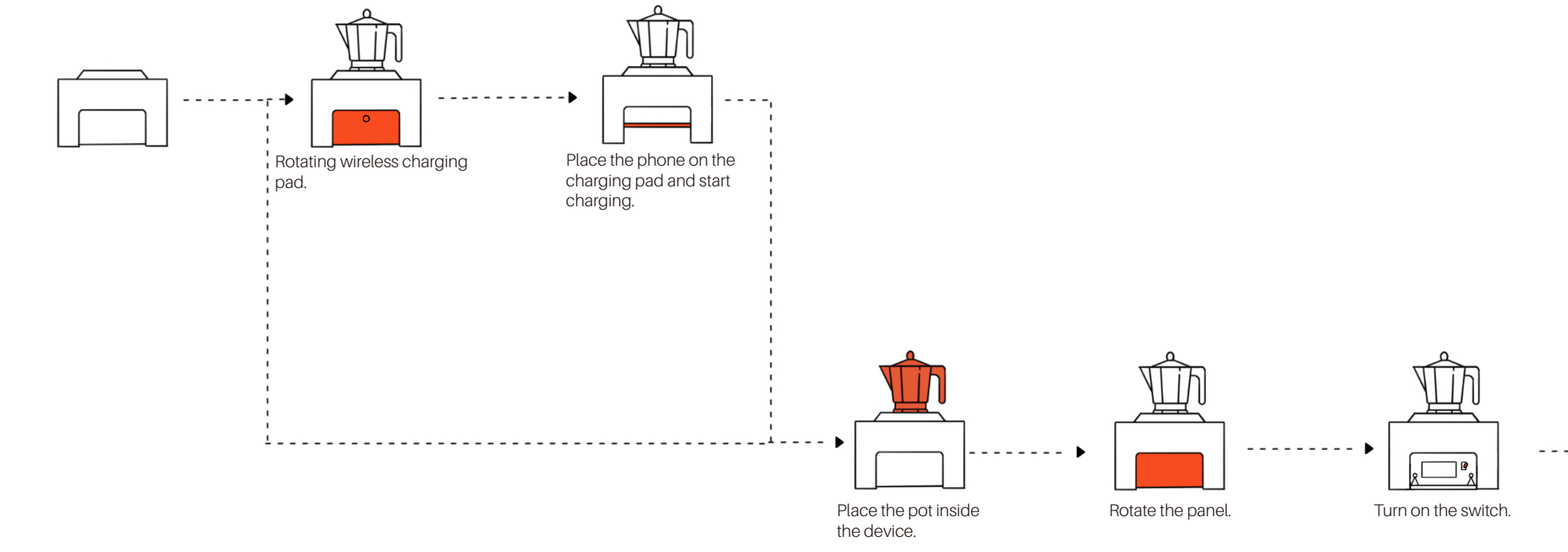
5.2 User flow

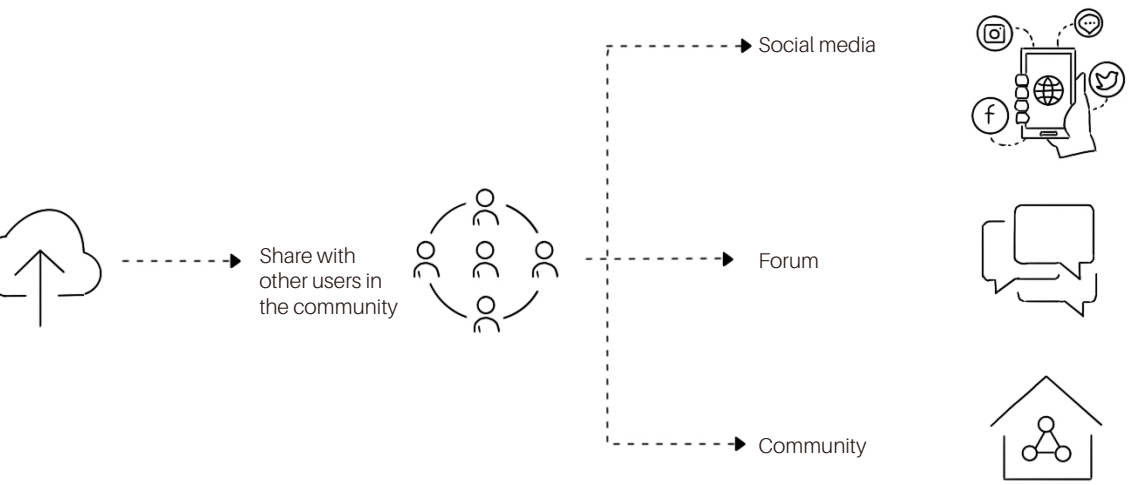


Purchase process

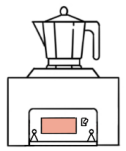


User flow





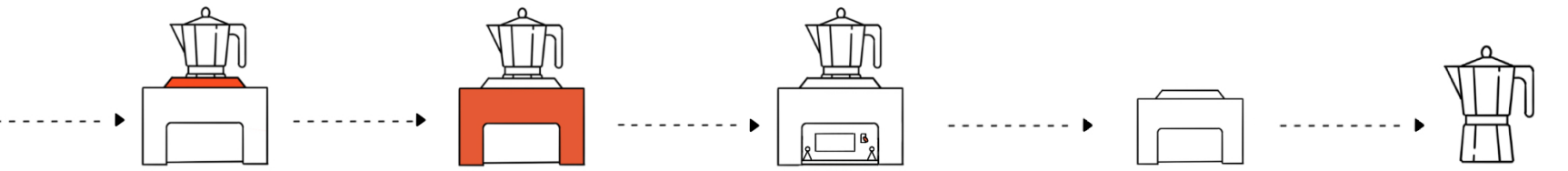
Additional features



Users can play games to destroy boredom while waiting.

Considering that FABLAB is a non-profit organization, users are allowed to donate for the drinks.

The lights create a relaxing atmosphere and also give feedback to the user on the working status of the device.



The device begins to heat up while the ambient light comes on.

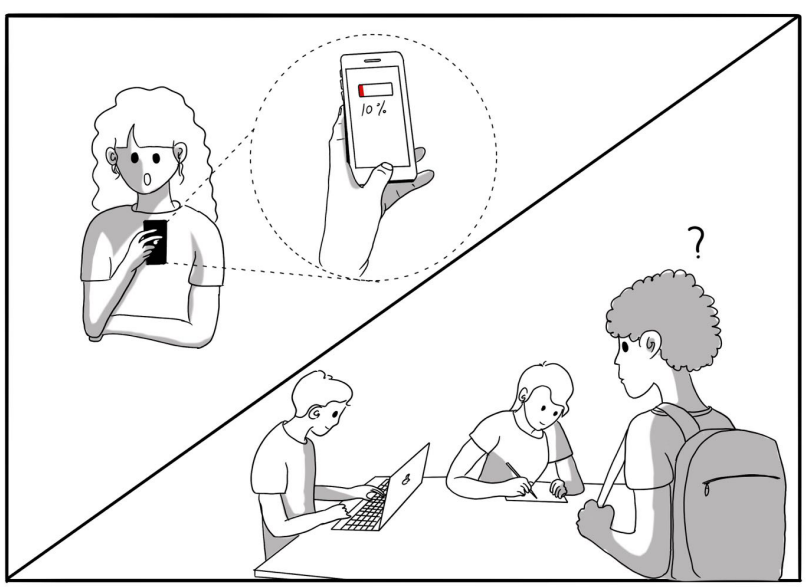
A relaxed environment helps facilitate communication among users.

During the waiting time, users can eliminate boredom with games.

End heating, turn off switch and enjoy coffee.

Clean the coffee pot

5.3 Storyboard



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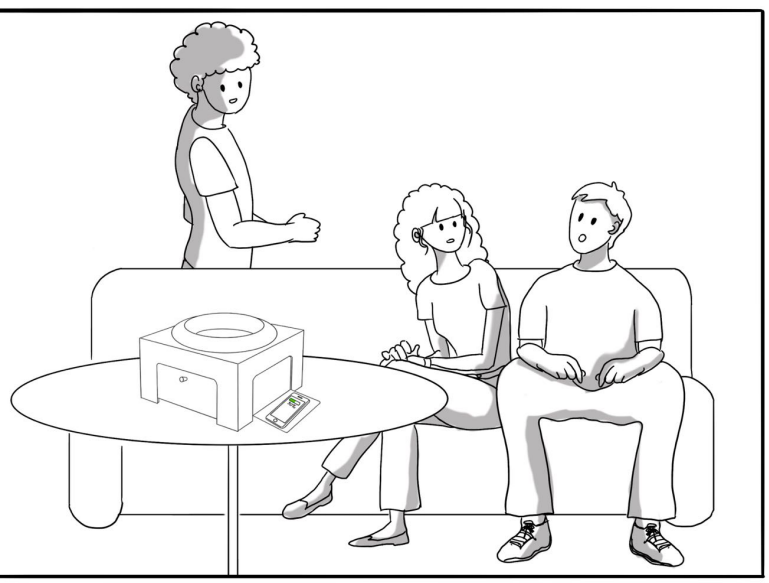

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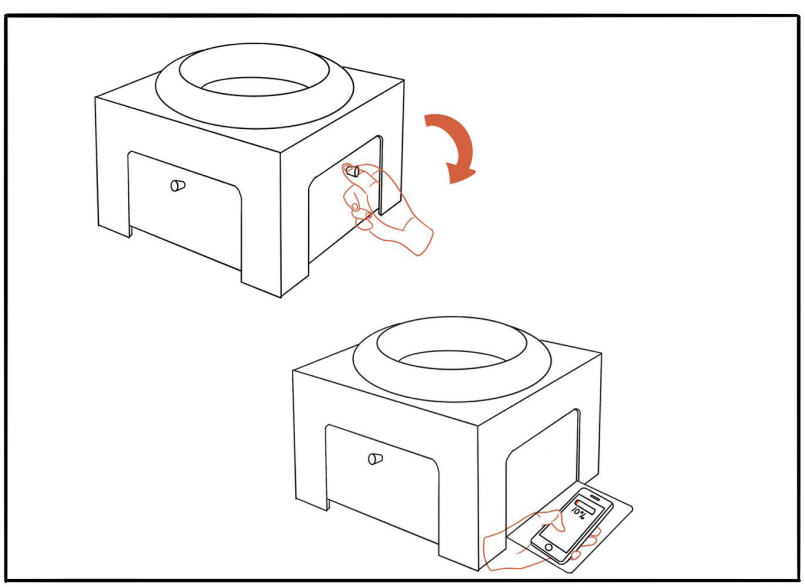

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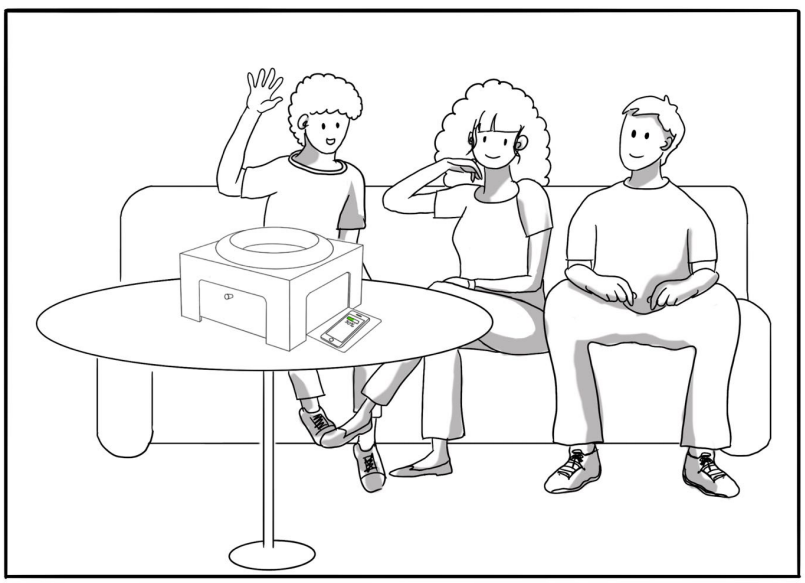

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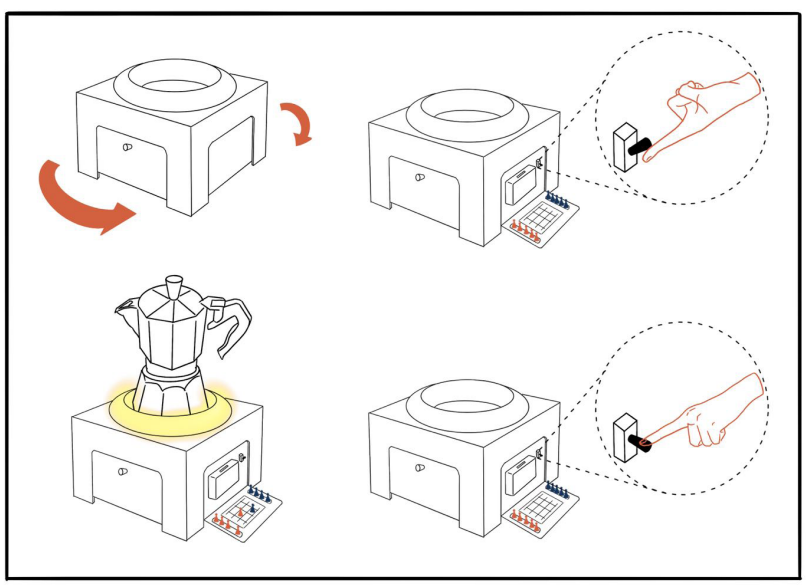
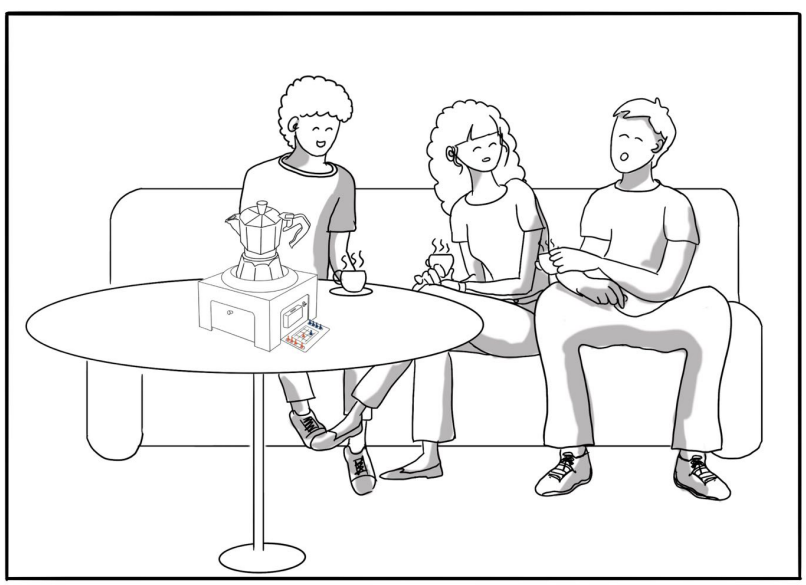


5

1 By the afternoon, Lilia realized that her phone was dying and there was no available place to charge it.

2 Lilia walked over to the device, rotated the charging pad, put the phone on it and started charging.

3 Lilia noticed that there were other people talking here, and since she didn't have a phone to relieve her boredom, she walked over to see what they were talking about.



6

4 The topics they talked about caught Lilia's interest, so she joined them. After a while, someone offered to have something to drink.

5 Everyone said they wanted to have a cup of coffee, so Lilia put the coffee in the moka pot and turned on the switch of the device and started preparing the coffee.

6 While waiting for coffee, they discovered that there was a board game to play together. So they played the game and chatted until the coffee was ready.

5.4 Testing

We interviewed many users of our target group to check the efficiency of our product, asking them for opinions on use, functions and aesthetics. These are the results.

How do you feel about using it?

- Great, I have a place to charge my phone and I don't need a cable!
- It's not bad, wireless charging is convenient, but I don't use it much to make coffee because I feel like there's some time wasting.
- The charging is fantastic and my phone's life has been extended.

When the device's ambient light comes on, does it remind you of a campfire? Or does it make the environment relaxing?

- Honestly not, as it's a bit underlit and not very noticeable during the day
- It doesn't seem to, and it's not shaped like a flame!
- No.

Do you think the board game is interesting?

- I haven't played this game, how it plays.
- It's interesting. It's a little more complicated than the traditional one.
- I haven't played it yet.

● Actively ● Negatively ○ Ineffective

Would you be interested in making or recommending this device for other communities you participate in?

- ○ Sorry, I don't seem to be part of any other communities.
- ● emmmm, I've also joined a skateboarding organization, but it doesn't feel like too much of a good fit.
- ● Of course, I think any local rest area should have this.

Do you think this device has facilitated people here to interact with each other?

- ● I think it's more useful to promote communication. Sitting here, if there's a topic I'm interested in, it's easier for me to communicate with others.
- ● Yes, if I don't have my phone anymore, I'm still happy to communicate with other people.
- ● It might be useful, but I'm so busy every time I come here that I don't really care.

What do you think needs to be improved?

- ● This light is a little too dim, if used as an ambient light.
- ● It would be nice if it could make coffee automatically and without the clear moka pot.
- ● I think what needs to be improved is that I hope the light changes can be more abundant and more interesting.

6. Communication

6.1 Logo

Logotype

Concept

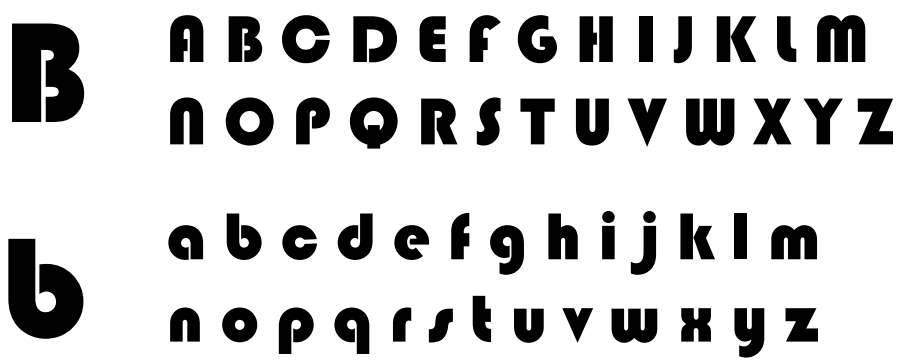
The logo is divided into two parts: product name and graphic logo. We named the product Campfire, which means that we hope that this product can bring people together like a campfire and promote sharing and communication with each other. The graphic symbol consists of the top view of the product, the outline of the flame and the icon of the person.

Standard font

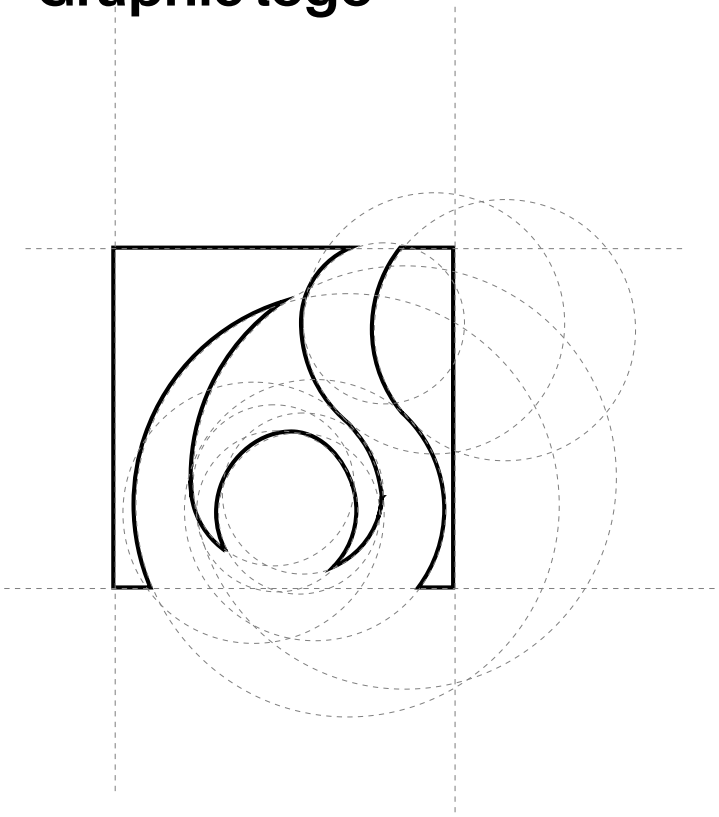
Bauhaus 93

Bauhaus 93 is a variant of URW Blippo Black. It was first released in 1993 by the URW Type Foundry. Only one font was produced. It is available as a pre-packaged font in Microsoft Word, and is used within the backsplash for 3D Pinball for Windows – Space Cadet. It is also used for the Postman Pat and Playmobil logos, around Disney's Polynesian Resort, as well as the Amiibo logo. Also used on Xinwen Lianbo in 1996 and Chuzzle as well as Homestar Runner. And it was used for the FIlmways Television logo from 1976 to 1983, as well as their film division from 1981 to 1982.

Glyph and characters



Graphic logo



Color planning

6.2 Advertising

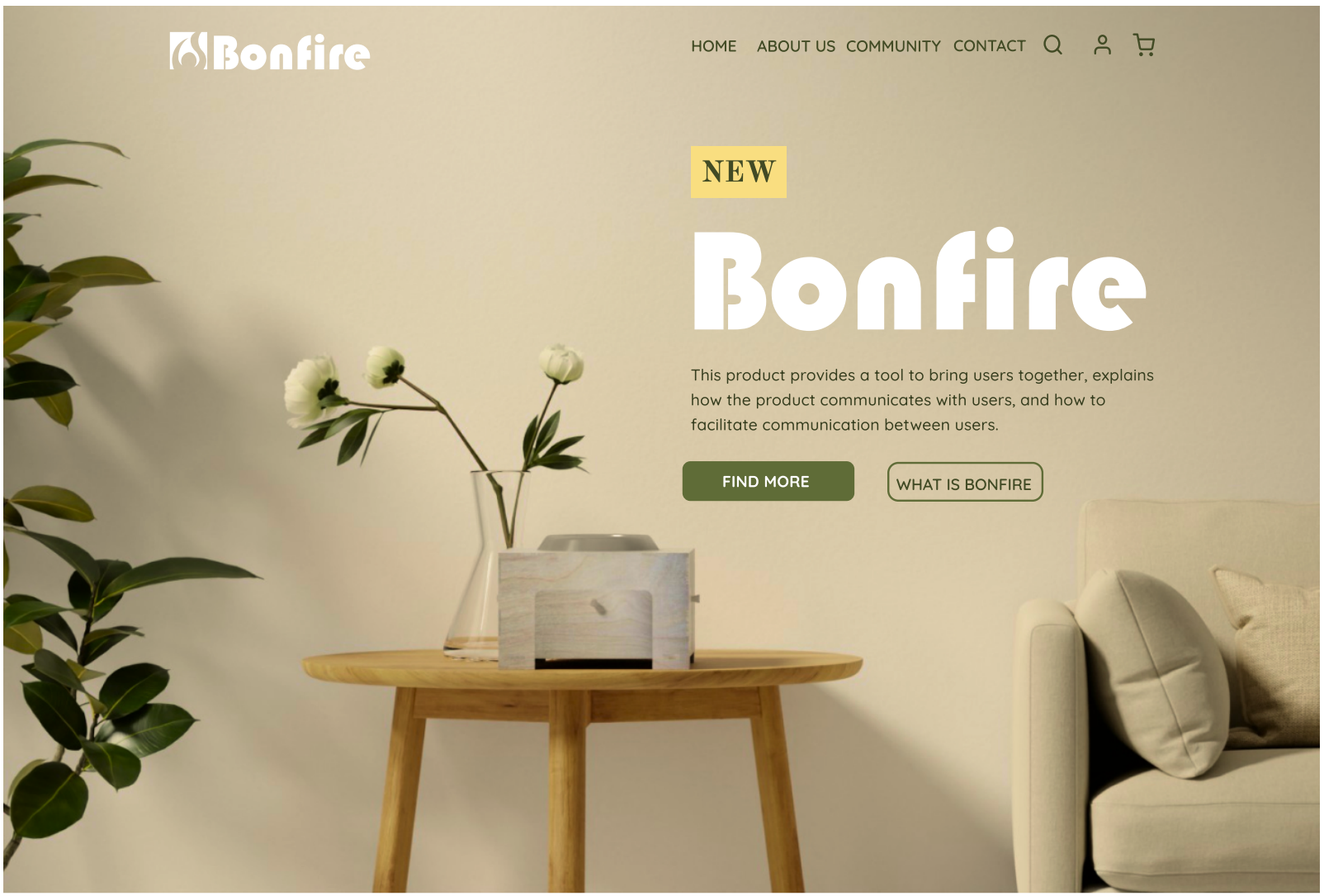
Advertising is the largest, fastest and most widespread medium of information delivery. Through advertising, we communicate the final form, function and purpose of the product to everyone. To attract attention and interest, so as to further promote everyone's understanding of the product.

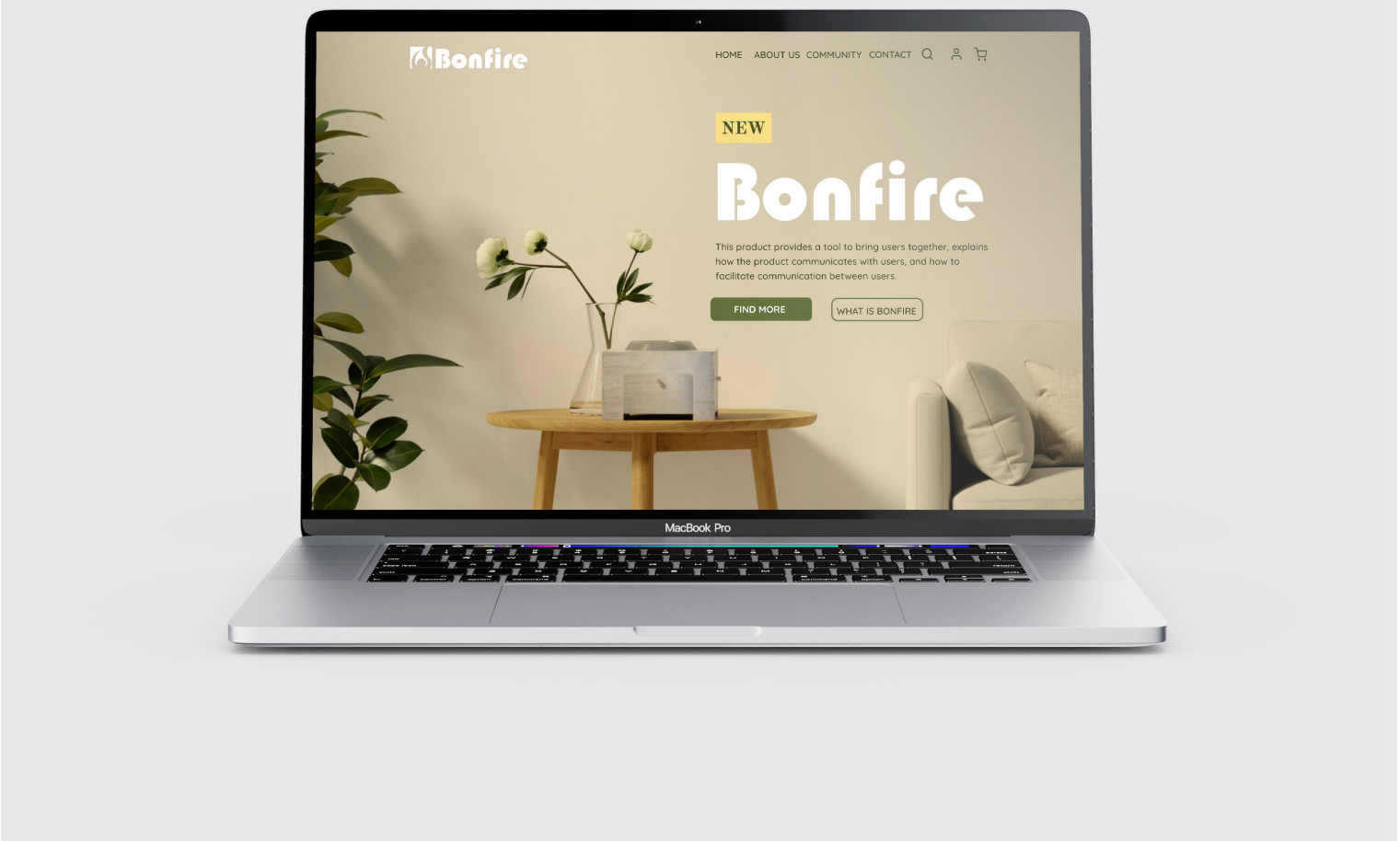
onfire

luct Bonfire, which means that we hope that this
eople together like a campfire and promote sharing
with each other. The graphic symbol consists of the
luct, the outline of the flame and the icon of the

6.3 Website

In the prototype of the web page, the effect map of the location, atmosphere and environment of the product in the space is displayed, which reminds people that the product is placed in the rest area, and promotes communication and exchange. The upper left is the product logo and name, the right is the instruction menu of the webpage, the current page is the home page, there is a brief introduction of the product, to learn more, or to know the product, you can directly click the two selection boxes in the lower right. Click about us to learn about our design team and design philosophy, and the origin of this product. community provides an online community for everyone who uses the product to exchange experiences and experiences, and contact can contact us with problems encountered.




Bonfire
HOME ABOUT US COMMUNITY CONTACT
NEW
Bonfire
This product provides a tool to bring users together, explains how the product communicates with users, and how to facilitate communication between users.
FIND MORE
WHAT IS BONFIRE
MacBook Pro

6.4 Packaging

Our packaging materials are made entirely of cartons, the greatest benefit of cartons is that they retain their advantages throughout the life of the product. The carton is also a clear and specific product information billboard, and the folded design makes it easy to open and re-close the package, thereby extending the life of the product. Cardboard is the most environmentally friendly option. They are easy to recycle, non-toxic, reusable, and finally its simple structure is well known, which makes it easier for people to use. We print the logo and name of the product on the front and side, so that the name of the product can be clearly known from any angle.


Bonfire
Bonfire
This product provides a tool to bring users together, explains how the product communicates with users, and how to facilitate communication between users.

After the package is opened, in order to display the information of the product more prominently, we directly print the size of the product and the final assembled appearance on the inner top surface of the carton, so that while watching, we can free our hands to assemble the product.


Bonfire
This product provides a tool to bring users together, explains how the product communicates with users, and how to facilitate communication between users.

7. Conclusion

Conclusion

The final project aims to facilitate communication and sharing among the users of the Fablab Torino community and to create a better environment for this purpose, as well as to meet some of their other needs, such as cell phone charging and beverage supply, to make the rest area more comfortable. We didn't intend for it to be a big, bulky device, instead we wanted to save as much space as possible and use the smallest lever to pry the earth. By turning it into the center of the lounge area, we will bring all the users here to come over and face each other, bringing them closer together, relieving awkwardness, creating more opportunities for communication, and gradually improving the user experience of the whole community.

It is important to note that the direct users of this product are the members of the community, but the potential buyers should be the managers who want to improve the community environment, so we have a vision for the future, if the formation of a community around BonFire, and the purpose of this community is to serve and improve other communities, it will not be a very interesting thing. bonfire community The guidelines for the Bonfire community continue to draw on Fablab, practicing open source and non-profit, all working together to improve the common environment.

8. Reference

Reference

https://fablabtorino.org/history

https://books.google.it/books?id=F6u4DQAAQBAJ&printsec=frontcover&hl=zh-CN#v=onepage&q&f=false
Nicholas A. John, The Age of Sharing, John Wiley & Sons, Hoboken, 2016, 224 pp.
https://www.shareable.net/a-short-history-of-the-word-sharing/

https://asistdl-onlinelibrary-wiley-com.ezproxy.biblio.polito.it/doi/10.1002/asi.23320
Sanghee Oh,Sue Yeon Syn, Motivations for sharing information and social support in social media: A comparative analysis of Facebook, Twitter, Delicious, YouTube, and Flickr, Politecnico Di Torino Sist, 21 April 2015.

https://onlinelibrary-wiley-com.ezproxy.biblio.polito.it/doi/epdf/10.1002/hrm.20298
Gagné, Marylène, A model of knowledge-sharing motivation, Hum. Resour. Manage, 28 July 2009, 571-589 pp.

https://www-sciencedirect-com.ezproxy.biblio.polito.it/science/article/pii/S0378720607001255
Chin-Lung Hsu, Judy Chuan-Chuan Lin, Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation, Information & Management,
Volume 45, Issue 1, 2008, Pages 65-74.

http://www.jstor.org/stable/10.7249/j.ctt5hhw06.8.
Keller, Kirsten M., et al. "Barriers to Information Sharing." Facilitating Information Sharing Across the International Space Community: Lessons from Behavioral Science, RAND Corporation, 2013, pp. 3–10.

https://www-sciencedirect-com.ezproxy.biblio.polito.it/science/article/pii/S0378720610000364#aep-section-id24
Chih-Jou Chen, Shiu-Wan Hung, To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities, Information & Management, Volume 47, Issue 4, 2010, Pages 226-236.

http://www.growingscience.com/msl/Vol10/msl_2020_127.pdf
Ngoc Tu Tran, Factors affecting knowledge sharing behavior of lecturers: The case of public universities, Management Science Letters, Letters 10, 2020.

https://www-tandfonline-com.ezproxy.biblio.polito.it/doi/full/10.1080/09613218.2018.1463750
Weijs-Perrée, Minou, van de Koevering, Jasper, Appel-Meulenbroek, Rianne, Arentze, Theo, Analysing user preferences for co-working space characteristics, Building Research & Information, Volume 47, Issue 5, 2019, 534-548 pp.

https://zh.m.wikipedia.org/zh-hans/%E8%81%9A%E7%A2%B3%E9%85%B8%E9%85%AF

https://zh.m.wikipedia.org/zh-hans/%E8%81%9A%E7%A2%B3%E9%85%B8%E9%85%AF

https://en.wikipedia.org/wiki/Polypropylene

https://en.m.wikipedia.org/wiki/Laser_cutting

https://3dprint.com/240856/green-fab-lab-using-the-fab-lab-to-3d-print-new-things-from-recycled-plastics/

https://it.wikipedia.org/wiki/Open_source

https://www.redhat.com/it/topics/open-source/ what-is-open-source

https://it.wikipedia.org/wiki/Licenze_Creative_ Commons

https://creativecommons.org/licenses/by-nc- sa/4.0/legalcode

Image Reference

https://twitter.com/FAB16Montreal/status/1397231514681761792/photo/1

https://chesssifa.altervista.org/posti/fablab-torino/

https://ogrtorino.it/en/

https://toolboxcoworking.com/en/

https://www.officine.cc/

https://www.facebook.com/torinomakerfaire/

https://digifabturing.tumblr.com/

http://fabacademy.org/

https://sei.it/

https://www.officine.cc/

https://fablabtorino.org/3dprint/creality

https://anycubic.it/products/anycubic-kossel-3d-printer

https://fablabtorino.org/laser/matilda

https://fablabtorino.org/laser/eureka

https://fablabtorino.org/cnc/fresone

https://fablabtorino.org/cnc/roland

https://fablabtorino.org/vinyl/camm

https://fablabtorino.org/history

https://fablabtorino.org/association

https://fablabbcn.org/shop/smart-citizen-kit

https://fablabbcn.org/

http://fablab.veritas.cr/index.php
https://www.sfchronicle.com/culture/article/Iconic-hackerspace-Noisebridge-is-saved-by-15093821.php

https://makerfaire.com/maker/entry/69936/

https://www.amazon.it/gp/product/B07NP9NZ14/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B089K2GN5M/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B07PLGHNYF/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B07DG3QQZW/ref=ppx_yo_dt_b_asin_title_o04_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B08NGXQK5X/ref=ppx_yo_dt_b_asin_title_o06_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B01ANJSHGG/ref=ppx_yo_dt_b_asin_title_o08_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B07XLLTZ6S/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B08F6W28PL/ref=ppx_yo_dt_b_asin_title_o03_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B077GHTVRL/ref=ppx_yo_dt_b_asin_title_o04_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B08XWBGJHR/ref=ppx_yo_dt_b_asin_title_o03_s00?ie=UTF8&psc=1

https://www.amazon.it/gp/product/B08R3Q7KFD/ref=ox_sc_act_title_1?smid=ANU9XAJL6QFR9&psc=1