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Introduction

The term *open source* is becoming popular among product designers. We see websites and initiatives appear with a lot of good intentions but sometimes missing the point and often creating confusion. Design magazines and blogs are always rushing into calling an openly published creation *open source* but rarely question the licenses or provide schematics or design files to download.

We are furniture designers, hackers and artists who have been working with free/libre and open source software for quite some time. For us, applying these principles to product design was a natural extension, providing new areas to explore. But we also realized that designers coming to this with no prior open source experience had a lot of information to grasp before getting a clear picture of what could be open source product design. So we set ourselves to mobilize our knowledge in this book.

We hope that this tool can be a base for teaching and learning about open source product design; a collective understanding of what one should know today to get started and join the movement; a reference students, amateurs and educators can have in their back pocket when they go out to explain what they are passionate about.

How to read this book

We have divided this book in sections that make sense for us. Each of these tries to address what we think is a general question you might have about open source product design. These sections are independent from each other and can be read individually, but they also interconnect and influence each other. You can start reading from wherever you feel you're most interested in and find your way through the book or just follow the steps as we've laid them for you.

For each section, we've tried to keep a similar structure that is divided as follows:

- A bit of **theory**, where we define, explain and develop concepts from our point of view.
- Then a list of **tools** that are related to that particular section. As designers, we are not only producing objects, we are also building an intimate relation with the tools we are using.
- After this comes a series of open source **objects** that we think best represent what the chapter is about.
- A section called **food for thought** will point you to a variety of projects, examples, authors, theories... that are not necessarily open source but that could

nourish your intellectual process around it.

• And we finish with **open questions**, for us and for you, to think further about these practices and help us define the future of it.

Motivation

Why would you want to get into open source product design?

The state of design today

It seems like the only thing that worries designers these days is how to protect their work and their profits in a very conservative way. You've also heard many times someone comes with a supposedly good idea, someone else will promptly say "- *you should patent it!*", as if this was the only way to deal with your creativity.

If profit is the golden ratio of success stories and the prism through which design should be thought today, then this what we end up with:

Protection

What we learn in most design schools is all about protecting our work using patents and industrial design related rights (model and drawing deposits, etc.). There is also, of course, the default author's right applied to any *création de l'esprit* (intellectual creation), as the French call it. Patents and deposits have costs, are limited in time and limited by territory, unless you have almost infinite resources.

Obsolescence

Obsolescence is the state of being which occurs when an object, service, or practice is no longer wanted even though it may still be in good working order. -Wikipedia

Of which there is the now famous planned obsolescence with the sole intention of increasing sales volume and producing garbage.

Copy & anti-copy

The concept of copying has a particular significance in certain areas of law. In each of the primary areas of intellectual property law, a number of cases have refined the question of what exactly constitutes the kind of copying prohibited by law, especially in areas such as copyright law. –Wikipedia

There is much debate around copying and its usually negative connotations. There is "illegal copies" which could harm you or the author, the delusional control over copiers and the hypocrisy of some education systems who tend to punish copying but ask students to recite what they have learned. Copy is also invariably associated with stealing, thanks to the entertainment industry, although those two are very different concepts.

A "mental model" of design

A designer is an artist

A designer is a creator, an artist, who gets inspiration from a divine origin. Citation from the masters is authorized, but s/he should always come with something new and original.

Design locally, fabricate far away

Famous designers work like big brands, where their products are fabricated on the other side of the planet to limit costs and keep prices low for the end market while giving a comfortable margin for the producers.

Mass production

Design for manufacturing, where standard sizes are the norm and your products have to fit in predefined boxes. How fast can you get your product out and in what numbers?

Design for the rich

Quality design is a luxury product. Only the rich can access it.

Design for humans

With open source product design, we're moving the whole design process back to the source: taking care of humans, every human.

We are looking for a generous creative attitude where we know that an artwork is inspired by nature and should respect it.

We allow ourselves to copy as a way to learn, encourage our creativity and iterate design processes.

We learn from traditions and existing designs, and do not try to reinvent the wheel every time.

We don't focus our designs on revenues but see it as a service for society.

We choose the free/libre way because we can rely on a community for help, coworking and remixes.

We are not afraid of being copied.

We want a close relationship with our users, turn them into active contributors and get objective feedback.

We want to challenge the status quo and break social barriers.

We think of product design as a process, as communication, as information, and it wants to be free.

We know open source licensing is a key in upcycling and a legal framework for cradle to cradle thinking.

We don't have one size fits all so here's our files to make it fit for you.

If you can't modify it, repair it or improve it, you don't own it and this makes us angry.

We are not looking for perfection but know we have a better chance of achieving it if we work together.

Design together

Opting for a libre license ensures respect for author and the protection of its rights as author, while insuring visibility and dissemination.

Using libre licenses changes also the modes of production, conception and manufacturing of an object. Designer's work requires lots of skills and expertise. So a single object can take years to develop, requiring multiple skills. Often, several people contribute to the design of an object. Publishing an object using libre licenses opens the possibility of working with others, local or remote, using several consecutive publication-modification cycles.

Consumers can appropriate the object, and make a different use of it or adapt it to their own needs. Even though this scenario could be desirable for everything, it is not true today. Usually objects have a label saying something like this: "*Warranty void if manipulated by user or made an inappropriate use of it*". In the worst cases, there can be legal backlash too.

With open source product design, we reclaim the full ownership a buyer has over what s/he has acquired.

Ecodesign

Ecodesign is an approach to designing product with special consideration for the environmental impacts of the product during its whole life cycle. In a life cycle assessment, the life cycle of a product is usually divided into procurement, manufacture, use and disposal. -Wikipedia

In this sense, the environmental aspect is an important part of the project, whether it's the natural or social environment at stake. And open source product design could play an important role in these practices.

- Procurement: most of the open source design projects could or should use local materials.
- Manufacturing: the product could be constructed on demand, locally, while respecting the laws of labor.
- Disposal: Allowing people to modify the designs could encourage adaptation, reuse and the reduction of waste.

When a person chooses an open source product, s/he moves away from a passive consumer position into a collaborative process that could potentially be a less polluting system than productive consumption.

Tools

Ok, this is a tricky one. What are the tools to stay motivated or to motivate yourself to go into open source product design? This is actually a very personal question. We hope this book will be a tool. You tell us. But here's some other suggestions.

Get inspired

Read, search and document yourself. This is why we've laid a "food for thought" part in each section of the book. Because those things listed here, one way or the other, inspired and motivated us.

Challenge yourself

This is a somewhat new and open field, and there is a lot of creativity going around it. New business models, new collaborative processes, new publication models, etc. There is plenty of things to invent and plenty of challenges to create.

Release early, release often

This motto comes from open source software practices and encourages creators to publish their project right from the beginning (or almost) and to regularly update it. If you're willing to go the open way, don't keep things hidden until they are finished. You might loose energy on the way. You might also miss an opportunity to find collaborators.

Get connected

This is a community. We're online and offline talking to each other, supporting each other.

Objects

Open source stethoscope by Tarek Loubani

The bypass of Israel embargo on medical equipments in Gaza

Tarek Loubani, a Palestinian physician who works in Gaza and Canada, discusses the Palestinian struggle to bring the benefits of modern (and sometimes not so modern) medical devices to the population of Gaza, consequently picking a free and open model for hardware and software development that facilitates autonomy and collaboration with other disenfranchised populations in the developing and developed worlds. –Wired

Reprap



Reprap project aims to create a self replicating machine. This project has grown steadily because most designs used libre licenses, allowing people from all over the world to contribute and improve them. Some of the most common printers are based on Prusa i2 and Prusa i3 designs. More on http://reprap.org/

Prosthetic hands



Cut down the cost of medical equipment production by using libre designs. These prosthesis that can be extensively customized to fit children needs. Using digital fabrication tools, such as 3D printers, new pieces can be constructed to accommodate children growth with very low costs.

Food for thought

Approved adaptations

The limit of derivation in the classic copyright design.

The original LC2 armchair and sofa by Le Corbusier is still sold and edited by Cassina Although adaptations of it by Doshi Levien and edited by Moroso are allowed on the market.

Emco fights Ikea over a supposed copy of Norman Foster's 20-06 stacking chair. http://www.dezeen.com/2015/03/25/ikea-faces-legal-action-over-alleged-copyrightinfringement-melltorp-dining-emeco-norman-foster-20-06-stacking-chair/

La Société de consommation

This book written by sociologist Jean Baudrillard in 1970 describes how, in contemporary societies, social relationships have been restructured by a new phenomenon: mass consumption.

Shaker movement

The shaker movement is a religious sect that had guiding principles of simplicity, utility and honesty. Their beliefs were reflected in the well-made furniture of minimalist designs.

The Shakers' dedication to hard work and perfection has resulted in a unique range of architecture, furniture and handicraft styles. They designed their furniture with care, believing that making something well was in itself, "an act of prayer." Before the late 19th century, they rarely fashioned items with elaborate details or extra decoration, but only made things for their intended uses. [...] Early 19th-century Shaker interiors are characterized by an austerity and simplicity. The simple architecture of their homes, meeting houses, and barns have had a lasting influence on American architecture and design. –Wikipedia

Victor Papanek



Victor Papanek was a designer and educator who became a strong advocate of the socially and ecologically responsible design of products, tools and community infrastructures. He disapproved of manufactured products that were unsafe, showy, maladapted or essentially useless. His products, writings and lectures were collectively considered an example and spur by many designers. Papanek was a philosopher of design and as such he was an untiring, eloquent promoter of design aims and approaches that would be sensitive to social and ecological considerations. He wrote that "design has become the most powerful tool with which man shapes his tools and environments (and, by extension, society and himself).

–Wikipedia

Find and read his book *Design for the Real World: Human Ecology and Social Change*, you won't regret it.

Jean Prouvé

Jean grew up surrounded by the ideals and energy of "l'École de Nancy," the art collective to which his father belonged. Its goals were to make art readily accessible, to forge links between art and industry, as well as between art and social consciousness.

The metal furniture of Jean Prouvé was produced copiously in every studio and workshop. His work involved frequent collaboration, most famously with Charlotte Perriand and Pierre Jeanneret. The style is set apart from the Bauhaus steel furniture of the time by his rejection of the steel tube technique. Prouvé had more faith in the durability and form of sheet metal, "bent, pressed, compressed than welded". His designs speak of a work philosophy that includes knowledge of the materials at hand, a commitment to collaboration between artists and craftsmen, an attention to evolving technical developments, and "the principle of never postponing decisions so as neither to lose the impetus nor indulge in unrealistic forecasts". Prouvé was influential in the development of the idea of nomadic architecture, likening a chair to a house, and designing both with portability in mind.

-Wikipedia

His achievements in folded sheet (originally of lower costs and higher strength, like the bodywork of cars) include libraries, armchairs, Anthony beds, desks and Compass tables. These pieces are exemplary and are quoted as the highest in design for 20th century. An original edition of Anthony chair is worth 40.000 EUR; a Kangaroo chair was sold for 152.449 EUR in March 2011; a library could be valued at over 160.000 EUR)

Design for the art market.

Carpenters Workshop Gallery is a hybrid concept gallery where "designers" are now called "artists".

When we started out, less than a decade ago, there was little connection between art and design. Since then, things have changed so much. We are pleased to see that now there are designers who no longer do industrial design; they are creating a new kind of discipline that is closer to art. -Julien Lombrail

Enzo Mari

Enzo Mari is a noted Italian modernist artist and furniture designer. He is famous for his *Autoprogettazione* manual.

The 19 Do-It-Yourself furniture designs, which the Italian Designer Enzo Mari published in his book 'Autoprogettazione' in 1974, marks a milestone in the comtemporary design history. Positioned in contrast to the formalism at the time, Enzo Mari suggests the democratisation of design and creating a provoking alternative to the capitalist paradigm of mass consumption. Building your own furniture, when required, that's the idea. http://www.cucula.org/en/enzo-mari/

This project was born in 1974 just after the first oil crisis of 1973. The poverty in Italy and all Europe was huge. Enzo Mari with this project gives a social design answer to his contemporary fellows.

Gerrit Rietveld

Rietveld was a Dutch furniture designer and architect. One of the principal members of the dutch artistic movement called *De Stijl*. Piet Mondrian is the most famous figure from that movement. Rietveld is famous for his Red and Blue Chair and for the Rietveld Schröder House.

The original Krat (Crate) furniture was produced using untreated red spruce normally reserved for packing cases. It was sold in a kit form, to be assembled at home by the purchaser. The Crate furniture was a response to the economic crisis of the 1930s. It offered useful, inexpensive seating with basic construction and cheap materials. Other items of Crate furniture include a Crate easy chair, Crate table, Crate desk, Crate bookcase and a Crate stool, all from 1934. –annetgelink.com

How to construct Rietveld furniture documents the best known and most typical furniture designs by Gerrit Rietveld down the smallest detail. The book contains working plans, measurements, detail drawings, lists of materials and instructions for the assembly of each piece, as well as historical information about each one. –How to construct Rietveld furniture

Bernard Stiegler

Bernard Stiegler is a french philosopher and head of the Institut de recherche et d'innovation (IRI), which he founded in 2006 at the Centre Georges-Pompidou. He is also the founder in 2005 of the political and cultural group, Ars Industrialis, and the founder in 2010 of the philosophy school, pharmakon.fr [...] His key themes are technology, time, individuation, consumerism, consumer capitalism, technological convergence, digitization, americanization, education and the future of politics and human society. –Wikipedia

Thomas Chippendale

Thomas Chippendale was a London cabinet-maker and furniture designer in the mid-Georgian, English Rococo, and Neoclassical styles. In 1754, he published a book of his designs titled The Gentleman and Cabinet Maker's Director. The designs are regarded as reflecting the current London fashion for furniture for that period and were used by other cabinet makers outside London. –Wikipedia



Open questions

- What are you designing for?
- As a designer, what is your relation to technology?
- What are the responsibilities of a designer in a mass consuming capitalist society?

Licenses

The first step in any open source design approach is to choose a license. This will condition every other step taken afterwards. The license is the social contract a designer is making with everyone else involved in the project. This contract, once set, is explicitly or implicitly signed by the other designers working on improving the project, by the manufacturers of the object and by its final users. This social contract is what differentiates open source product design from a more traditional approach.

Usually designers think about licensing once they start dealing with an editor or manufacturer, putting the choice of a license closer to the end of the design process. This contract usually benefits parties that know each other while it restricts any use beyond those not directly involved in the creation or build process. In this classical approach, the license is mainly a commercial agreement.

Open source design addresses this the other way around: choosing a license must be placed at the beginning of the process. The license is specifically made for parties that don't know each other. As an open source product designer, I don't know yet who will be involved in my project, who will build it or possibly even what purpose the object will be used for. The license can address commercial terms, but does not need to do so.

As with a classic contemporary design approach, licenses are made to protect the designer. But in open source design, these licenses are also made to protect the users or any other person in relation to the design. Today, more and more objects are given to you with restrictions on use, placing restrictions on how you can open and own those objects. Take a car for example, or a smart-phone. As a user you have very little say about how those things work, let alone the possibility to repair them when they are broken. And this is not only related to the technical knowledge to do so but also with the legal right to apply any modification.

Four freedoms

Open source product design is a practice that comes from free/libre and open source software and as such follows the same principles, but applied to objects. There is an easy way to determine if a license is "open source" or not: does it respect the 4 freedoms?

Here are those 4 freedoms applied to objects:

- 1. The freedom to use objects as you wish, for any purpose (freedom 0).
- 2. The freedom to study how the object works, freedom to build it and change it so it behaves as you wish (freedom 1). Access to documentation, build processes

and sources are a precondition for this.

- 3. The freedom to redistribute the documentation, build processes, sources and copies of the object so you can help your neighbor (freedom 2).
- 4. The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the documentation, build processes and sources are a precondition for this.

Commercial or Non-Commercial

Many times, the question of the commercial exploitation of a design generates heated debates in the open source design community. We'd like to refer you to the section about economics to understand more about this, but we want to make clear here that any license that would prevent any commercial use of a design **does not comply** with the four freedoms. Why? Because this conflicts or puts limitations on the freedom 2 and 3.

If you license your project with a commercial restriction, it can't rightly be called "open source design". Instead, you might want to have a look at our "Definitions" section to find a better generic name for your project.

I don't need a license, I already share everything

People deeply involved in community activities are usually well versed at the practice of sharing and know the benefits of it. Because of this, they sometimes overlook the need for attaching a license to their work. And this is a big mistake.

By default, every creation is protected by copyright. So even if some work is shared freely among a group of user, at any point in time, the creators of that work could apply restrictions and claim compensations for the use of it. Not applying a license to some shared work means trusting that the creators won't change their mind later on. This is fine most of the time, until money or any form of compensation is involved. By attaching a clear license to your work, you can get those problems out of the way and trust that nobody will change their mind even over time.

Another undesired or unseen side effect of not using a license is that you will exclude a lot of people from participating and prevent people from spreading your work. Even if you've said that you want your work to be shared, if there is no license attached, people will have to contact you every time they want to do someting special with it and ask you for a proper authorization. Licensing your work makes sharing faster and safer for everyone and requires less energy over time. Copyright means that you have to ask the authors permission for anything you want to do with their work. This is the default behavior. So if you really want people to do anything they want with your work, you have to reverse copyright and apply "copyleft", something that can only be done with a license.

Is there an ideal or perfect license for open source objects?

Sorry to say it, but no. Although there are many open source licenses for software and some of those licenses might work for design documents, there is no magic solution that can work in any case. Remember that licenses are generally complex legal documents that try to cover as many cases as possible and that give guidelines on what is permitted or not. As we said, these are social contracts, and as such could be ideal in a particular situation, but could be problematic in others. In the case of open source licenses, since these grant more freedoms than they restrict, they generally tend to create less problems than some others. Fortunately also, and as open source product design becomes more and more popular, we can expect that licenses will improve and adapt to the new conditions brought by our future societies.

Please, refer to the "Tools" chapter of this section to have an overview of the licenses available and their use cases.

Terms of use and liability

Usually, when you acquire an object, some terms of use define the cases for which the object has been intended and limits the responsibility of the designer to those cases. It is commonly accepted that a designer is responsible for the creation and quality of the objects being produced following his technical plans. In most countries, designs have to go through extensive testing and have to follow local regulations before being put on the market.

With open source product design, the responsibility is often transfered to the person receiving the documentation and is totally removed from the creator's hand by the license. As with open source software, documentation and objects being offered have no guarantee of usability, functionality or purpose of any kind and the final user cannot consider the designer responsible for anything, including faults and errors.

Because of this, if you intend to download, build and commercialize any open source object, you should check your local regulations for the implications of such practices and get advice from a specialized lawyer.

Tools

Free Art License



This is the prefered license used by Libre Objet members. This license was written by Antoine Moreau and friends and originated in France. The F.A.L. is very easy to read and simple to understand. It has been written especially for works of art regardless of their type or expression and is respectful of the Roman version of the author's right (as opposed to the English copyright)

Creative Commons

Ccreative Commons

Surprise, surprise! Creative Commons is not a license. **It's a set of licenses**. We often hear: "I publish my creations under Creative Commons" as if this would instantly make you a nice person. It does not. Creative Commons offers licenses that range from total freedom to almost no freedom at all. Fortunately, due to their popularity, you will find countless texts that explain the use of each of the Creative Commons offers you that option. But remember, because of this, some of the Creative Commons licences are not actually open source. Here are the licenses that you can be considered open source:

• Attribution-Share Alike (CC-BY-SA)

- Attribution (CC-BY)
- Public Domain Dedication (CC0)

TAPR License

The TAPR Open Hardware License is a license dedicated to open hardware projects, usually electronics components involved in amateur radlio. This license could be applied to any objects and addresses the specificity of open sourcing physical objects.

CERN

In the spirit of knowledge sharing and dissemination, the CERN Open Hardware Licence (CERN OHL) governs the use, copying, modification and distribution of hardware design, documentation, and the manufacture and distribution of products.

GPL



The Gnu General Public License is the mother of all open source licenses. It was created by Richard Stallman and has been used and released as early as 1989. This license is certainly the most popular license for free/libre and open source software, but it can also apply to the designs of objects.

WTFPL



The "do What The Fuck you want Public License" is a very short and somewhat funny license that exists as a response to flame wars that often occur between partisans of one license or another.

But if you really don't give a fuss, you could be nicer to everyone by just dedicating your work to public domain through the use of a CC0 license or doing a direct public domain dedication if you're located in a country where it is permitted.

Peer Production License

The Peer Production License by John Magyar and Dmytri Kleiner is a very interesting take on the commercial or non-commercial debate that happens around open source product design. Basically, it cannot be considered an open source license as it restricts freedoms on uses and distribution, allowing only other commons-ers, cooperatives and nonprofits to share and re-use the material, but not commercial entities who intend to make profit through the commons without explicit reciprocity. To our knowledge so far, no designs have been released under this license.

FabL

The Fabrication License is a new license – in the making – especially dedicated to the cases brought by growing popularity of fablabs and open source design. This license is being developed around the same community that developed the Free Art License.

More licences...

There are many more licenses that you could chose from. Some might be more suitable for documentation, or you could even write your own license. Keep in mind that a license is usually a legal document that both parties have to trust in order to engage in a collaboration.

In the end, the strength of a license will only be tested in case of conflicts and will be determined by a ruling from a judge.

Objects

Mmodulus



Mmodulus, a series of modular furniture by Martina Minnucci and Juan Freire has been published using a CERN license.

Archipel armchair



Archipel armchair , by Mathieu Gabiot, is an armchair published under the Free Art License.

MicroHouse



MicroHouse, by Open Source Ecology, is a small energy efficient low-cost house designed for two and has been released under a GPL License.

Mozilla Open Source Furniture



Desiged by Nosigner, elements that were used to compose the furniture for Mozilla's Japan office have been published under a CC-by license.

Food for thought

Copyright



Copyright is a legal right created by the law of a country that grants the creator of an original work exclusive rights for its use and distribution. This is usually only for a limited time. The exclusive rights are not absolute but limited by limitations and exceptions to copyright law, including fair use.

Copyright is a form of intellectual **property**, applicable to certain forms of **creative work**. Under US copyright law, legal protection attaches only to fixed representations in a tangible medium. It is often shared among multiple authors, each of whom holds a set of rights to use or license, the work and who are commonly referred to as rightsholders. These rights frequently include reproduction, control over derivative works, distribution, public performance, and "moral rights" such as attribution.

Copyrights are considered **territorial rights**, which means that they do not extend beyond the territory of a specific jurisdiction. While many aspects of national copyright laws have been standardized through international copyright agreements, copyright laws vary by country. –Wikipedia

Copyleft



Copyleft (a play on the word copyright) is the practice of offering people the right to freely distribute copies and modified versions of a work with the stipulation that the same rights be preserved in derivative works down the line.

Copyleft is a form of licensing, and can be used to maintain copyright conditions for works ranging from computer software, to documents, to art. In general, copyright law is used by an author to prohibit recipients from reproducing, adapting, or distributing copies of their work. In contrast, under copyleft, an author may give every person who receives a copy of the work permission to reproduce, adapt, or distribute it, with the accompanying requirement that any resulting copies or adaptations are also bound by the same licensing agreement. Copyleft licenses for software **require that information necessary for reproducing and modifying the work must be made available to recipients of the binaries**. The source code files will usually contain a copy of the license terms and acknowledge the authors. –Wikipedia

Ronen Kadushin

Ronan Kadushin, in his Open Design Manifesto, considers that there are two requirements for open designs:

- 1. They have to be published under a CC license.
- 2. They have to be build using only CNC machines.

Open Structures

The OS (OpenStructures) project explores the possibility of a modular construction model where **everyone designs for everyone** on the basis of one shared geometrical grid.

This approach of grid based designed applied to objects is very interesting and has produced intriguing objects, but it also shoots itself in the foot by not forcing anyone to use certain licenses that would give a legal framework to the "everyone for everyone" model.

IkeaHackers

The famous IkeaHackers website gets threatened for IP infringement.

Some months ago I received a Cease and Desist (C&D) letter from the agent of Inter IKEA Systems B.V., citing that my site IKEAhackers.net has infringed upon its intellectual property rights. [...] Long story short, after much negotiation between their agent and my lawyer, I am allowed to keep the domain name IKEAhackers.net only on the condition that it is non-commercial, meaning no advertising whatsoever. I agreed to that demand. Because the name IKEAhackers is very dear to me and I am soooo reluctant to give it up. I love this site's community and what we have accomplished in the last 8 years. Secondly, I don't have deep enough pockets to fight a mammoth company in court."

Open questions

- What is your preferred license and most importantly why?
- Should product designers write their own license?
- What limitations and opportunities exist in product design but not software design?
- What would be the physical representation of a license?
- How can we apply a license to an object?

Design (as a) process

It's the journey, not the destination.

Designing requires extensive knowledge in many fields and a lot of skills, both intellectual and manual. Skills like fine tridimensional sense, knowledge in geometry, mathematics, mechanics, anatomy and kinetics, proficiency with 2d or 3d software and lets not forget a feel for the beautiful. But don't be afraid, because everybody can design objects. Remember the times in when we used to buid huts, homemade bows or extraordinary worlds made with toys like Lego. Working with open source design does not make assupmptions about your knowledge but taps on your willing to learn and imporve your abilities.

Design Tactics

Open prototyping

Designers are usually expected to provide a polished product. With open source practices, this is not the case. You are encouraged to release your concept files and embryo of documentation as soon as possible. Prototyping should be done in the open, permitting other designers to join you.

Not starting from scratch

If I have seen further than others, it is by standing upon the shoulders of giants. –Isaac Newton

Sometimes when you are begin with the design of an object your are going to find yourself face to face to with a empty white sheet of paper. But if you work with object with open source licences you will be able to implement some designing tactics that allows you to begin working from the work of others designers, instead of starting from scratch.

Copying

To produce an object identical to a given object. -Wiktionary

Copying is the best way to learn, to appreciate, flatter and get in the mind of the original author. Copying a design, make it as indentical as possible, by redrawing the files in a different application or building replicas of the original object could teach you a lot of skills and give you a great sense of satisfaction. This is all permitted and even encouraged by open source licensing.

Adapting / modifying

To make suitable; to make to correspond; to fit or suit; to proportion. –Wiktionary

One of the advantages of open source objects is that you are allowed to adapt them to your own needs (or anyone else's needs). There could be diferent reasons for adapting or modifying an object. Sometimes the reasons for adapting a design could be personal (size, proportion, taste...), other times related to the physical context (climate, scale, materials available), technological context (technical knowledge and context available), social context (language, religion, tradition, icons..), etc.

If you want to share those changes, some open source licenses require that you publish them under the same license.

Forking

The "fork" means an object having a common root with a second one. Initially twins, these two objects will separate and follow their own developments. This terms comes from open source software development and was perceived as a negative action implying the death of one of the branch. But nowadays, forking is encouraged as a way to make adaptations to the original work that than could be merged back together afterwards to improve the original piece.

An example from the Diverted objetcs workshop given by Libre Objet



Mixing / merging

To combine items from two or more sources normally kept separate.

–Wiktionary

Another advantage of open source objects is that they can be combined. Youcould take two (or more) open source elements and mix them in order to create a new object. This could be an intereseting approach for hybrid desgins and other creative explorations

Parametric design

A possible approach for easier adaptations of an object is to use parametric design tools.

Parametric design is a paradigm in design where the relationship between elements are used to manipulate and inform the design of complex geometries and structures. –Wikipedia

Typically, this can be understood as defining a set of variables and relationship rules inside your design so that when those variables are modified, the resulting object is changed accordingly.



Upcycling

Upcycling is the process of transforming by-products, waste materials, useless and/or unwanted products into new materials or products of better quality or for better environmental value.

This approach, sometimes more associated with DIY and home crafting, could be more formalized and achieve a greater sustainability if it was also approched with the legal framework of open source licensing.

Design Tools

Physical production

Since the very first industrial manufacture machine "the spinnig jenny" the human being has been looking for improving the automatic fabrication processes in order to reach faster and more precise results. Thanks to the digital revolution that started in the middle of the previous century, nowadays we can program machines by computer to fabricate tangible object by defining them digitally. At first, this kind of technology was only available to professional industry, but in the last decades a democratization process of these technologies has started, making them accessible for everybody.

Some of these tools have been reduced in size, cost, dirtiness and noisiness, so they have become somehow more domestic. In other cases, some tools that are still big, expensive, dirty or noisy have appeared in a new kind of spaces that makes them accessible to the non professional people, sometimes named "fablabs", "makerspaces" or "micro-factories".

Neither do you have to rush into complex or automated manufacturing mechanism to design open source objects. Designing things to be made by hand could also appeal to a wider audience.

Materials

There are many types of materials that could be used for creating objects and at the same time there are many criterias to choose them. However, there are some properties you should consider for the open source object you are designing.

To achieve the largest distribution, an open source design should be fabricated anywhere by anyone or at least in the greatest amount of places possible and by the broadest range of people. For those reasons, at the time of choosing materials, you might have to consider materials that can be found easily anywhere.

The economic factor is also important. If you choose an extended material but that is expensive, only a few people will be able to build your design. Bu not only economic questions are important, you also should consider the ecologic. There are a lot of material that you can recycle, or even better, upcycle.

Finally you also have to consider the tools that you need to shape these materials. For example, glass and methacrylate are easy to find but while methacrylate could be easily cut by a common cutter, for cutting glass the tools are not as common and the technics are not as simple.

Tools

Designers love their tools. It's important to find the right tool for your designs, but this does not mean only technically, but also ethically. Free/libre and open source tools are the only tools that allow you to adapt them to your particular needs, that respect your freedoms, your users and your collaborators.

Of course you can create open source designs with proprietary tools. But these tools are not yours. You just have a temporary revocable license to use them. And if you design something that goes outside of what they have allowed, they might take them from you.

Free/Libre and open source tools are also generally better at handling open standards.

Free/libre softwares for DAO/CAO

LibreCAD

LibreCAD is a free/libre and open source CAD application for Windows, Apple and Linux that some users have compared to the proprietary Autocad.

FreeCAD

FreeCAD is a parametric 3D modeler made primarily to design real-life objects of any size. Parametric modeling allows you to easily modify your design by going back into your model history and changing its parameters. FreeCAD is a multiplateform customizable, scriptable and extensible software that reads and writes many open file formats such as STEP, IGES, STL, SVG, DXF, OBJ, IFC, DAE and many others.

OpenSCAD

OpenSCAD is a software for creating solid 3D CAD models using code. It is free software and available on all major plateforms. If you have abilities in coding and want to produce CAD files using a special scipting langauge, this might be the application you are looking for.

Blender

Blender is the free/libre and open source 3D creation suite. It is most well-know for its artistic capabilities in the field of 3D illustration and animation. It supports the entirety of the 3D pipeline from modeling to rigging, animation, simulation, rendering, compositing and motion tracking, even video editing and game creation. But more
and more people use it to produce or manipulate files for 3D printing and CAD related tasks. Advanced users employ Blender's API for Python scripting to customize the application and write specialized tools.

Inskape

Inkscape is a free/libre and open-source vector graphics editor that runs on all major plateforms. What sets Inkscape apart is its use of Scalable Vector Graphics (SVG), an open XML-based W3C standard, as the native format.

Digital Tools for fabrication

CNC router



A CNC router is a computer controlled cutting machine related to the hand held router used for cutting various hard materials, such as wood, composites, aluminium, steel, plastics, and foams. CNC stands for computer numerical control. CNC routers can perform the tasks of many carpentry shop machines such as the panel saw, the spindle moulder, and the boring machine. A CNC router typically produces consistent and high-quality work and improves factory productivity. Automation and precision are the key benefits of cnc router tables.

-Wikipedia

Laser cutter

Laser cutting is a technology that uses a laser to cut materials, and is typically used for industrial manufacturing applications, but is also starting to be used by schools, small businesses, 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 material or the laser beam generated. 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,[1] leaving an edge with a high-quality surface finish.

-Wikipedia

3D printer



3D printing, also known as additive manufacturing (AM), refers to various processes used to synthesize a three-dimensional object. In 3D printing, successive layers of material are formed under computer control to create an object. These objects can be of almost any shape or geometry, and are produced from a 3D model or other electronic data source.

3D printing in the term's original sense refers to processes that sequentially deposit material onto a powder bed with inkjet printer heads. More recently, the meaning of the term has expanded to encompass a wider variety of techniques such as extrusion and sintering-based processes. Technical standards generally use the term additive manufacturing for this broader sense. –Wikipedia

Build your own tools

Improving your tools by yourself or making your open source tools for doing open source design is another option. In the traditional woodworking this was a very common practice. Nowadays there are a lot of people that make their own tools or improving their own tools. For example the conversions of milling hand routers into a CNC routers or the fabrication of 3D printers.

Objects

Bouctje & REEBOeK



Bouctje is a bookshelf designed by Mathieu Gabiot on January 2013 and licensed with a Free Art License.

REEBOek is derived design of Bouctje made by Verly Laurent on September 2013 also licensed with a Free Art License.

This is a good example about the advantages of the open source objects. Thanks to the open license of Bouctje, its design could be modified, its scale and functionality were changed, and a new object with a new purpose is born.

Wikiseat



WikiSeat is an open source furniture project. That means that all of the documentation for how to build a WikiSeat is freely and openly published online. At the heart of each WikiSeat is a Catalyst. This is the structural support, made out of welded angle iron, that helps hold three legs in place. The seat part goes on top. It is a pretty simple idea, but there are no instructions for how to assemble these parts. We encourage people to find materials rather than buying them from a store. Every WikiSeat is a truly unique creation, a reflection of the creators environment and ideas.

-Wikiseat





uHbench



The uHbench (v 1.5) is a libre object designed by Julien Deswaef. Made with love and f/los software (Blender, Freestyle, Inkscape, Bash, XMLStarlet, Git & Gnu/Linux) Get from a standard (Epal-Eur) pallet to a public bench in just a couple easy steps. The idea came while thinking about urban hacking or how to reclaim public space with easy to find material and tools in urban areas. http://xuv.be/uH-bench-open-source-public-bench.html

Food for thought

Strandbeest



Theo Jansen has been creating Strandbeest (Dutch: strand=beach; beest=beast), wind-walking examples of artificial life, since 1990. What was at first a rudimentary breed has slowly evolved into a generation of machines that are able to react to their environment. Constructed as intricate assemblages of piping, wood, and wing-like sails, Jansen's creations are constantly being improved and have become excellently adapted to their sandy beach environment. –Wikipedia



This is a particular interesting exemple since, Theo Jansen has also built his own tools for creating and producing these machines and has followed a principle of forking and merging between every instance of his project.

Upcyclist

Filled with an enormous range of materials and objects, this unique book will inspire any designer or design-conscious consumer to incorporate upcycling into their creative practice or interior design projects. -Upcyclist by Antonia Edward.

1962 - Versioned physical sculpture



Sculptures conceptualized using a revision control system and represented physically. http://raphaelbastide.com/1962/

An exploration by Raphaël Bastide of the relation between open source tools, documentation and conceptualization of physical artefacts.

Sea Chair

Sea chair is made entirely from plastic recovered from our oceans. Together with local fishermen, marine plastic is collected and processed into a stool at sea. –Studio Swine

Open questions

- Do you think that the open source licenses make designing easier for nonprofessional people?
- Do you think that the open source licenses make designing more democratic?
- Do you prefer starting from scratch or from existing design?

Distribution

Distribution is one of the key feature of open source product design. This is the main reason we attach an open license to an object: to encourage its dissemination. Distribution is not only bringing a manufactured object from its production facility to the final user, it is also a feature of the object, a communication process, a dialogue between the designers, the builders and the users. In open source product design, distribution is the second step a creator has to take after choosing a license and will mostly be the continuous step that will persist through the design's life.

Distribution has to be thought of from two interacting point of views:

- The physical
- The dialogue

The physical

How is your object physically distributed?

As we mentioned in the Motivations section, one of the benefits of open source product design is that documentation can travel faster using contemporary communication tools than can an object shipped in a container. This then potentially seperates even more the places where objects are imagined from the places where objects are built. It is already the case when design is done in western countries for a western market and the resulting objects are produced in non-western countries with cheaper labor. But with open source product design, this relationship can be totally broken as objects could potentially be designed anywhere and fabricated where they are demanded. At least, this is where we do see the benefits of it. Of course, this particular relation could be "closed" again if only specific skills and tools are required to design and produce the objects.

Another benefit of digital distribution of documentation is when certain objects can't be found in certain parts of the world due to legal restrictions. Digital fabrication tools such as a 3D printer have changed the way we look at certain objects and opened the doors to the manufacture of "illegal objects".

Distributing physical open source objects

Something that is quite easy to figure out with software is if the software itself is open source. This is normally clearly indicated in the software itself. But with objets, this can be tricky. How can I know that the object I'm using is open source?

There might be ways to expose this with a proper marking or tagging on the object. Engraving or sticking a mention of the license and a url where to find further information about the object could be an elegant solution in some cases. Or maybe one day, design lovers will be able to recognise an open source object just by looking at it. But until then, this should be something to think about when desgining open source products.

Communicating the product's license directly on the product somehow is important. If the license is only mentioned on separate documents or packaging, it can be lost if the user decides to give the object away. The new users will then have no idea about the origin and lose the opportunity to know the benefits of the object and its license -- adapt, remix, etc.

The dialogue

How open is your conversation?

The dialogue between a designer and any other person involved in the project will be done through the **documentation**. If you don't document your project, nobody will be able to interact with it in a constructive manner. If we could again make a comparison with software, if you don't distribute the source code in a readable manner, if you only distribute binary files, it cannot be open source software. It's the same thing with objects. The full documentation is a requirement for open source product design.

By documentation, we mean all the documents one will need to copy and modify the product easily.

Documentation can take many forms. It could be sound, video, schemas, 3D files, 2D files, scanned drawings, etc. We don't see any reason why one type or other should be excluded as long as it is the most suitable format for documenting the project. But documentation has to always be published under an open source license and be available in an open standard.

Documentation is often overlooked by designers. And many projects fall short of being called open source product design because of their poor or missing docunentation. A rule of thumb when making a project is to consider that documentation will take at least 50% of the time.

And this should be done as soon as the project starts.

Documentation

Here are a list of things you should consider when documentating objects. This list is based on requirements we've made for adding objects to the Libre Objet.

- General view (picture or drawing) of your object
- General size (L x H x D) in m, cm mm or inches
- General standard views (front, left/right side, up/down)
- List of all materials used in the composition of your object
- List of tools required to build the object
- Date of creation
- Name of the designer(s) and any other authors involved
- Name of builder(s)
- Full license text (FAL, CC, CERN...)
- URL(s) of original sources
- Description of each part, like technical drawing with size, scale, front
- Description of the assembly, the order and way to mount it (drawings and pictures are better than only text)
- Description of potential issues or possible ways to improve the project (see Entropie's doc http://www.asso-entropie.fr/media/filer_public/cd/37/cd37e323-1f8c-450e-8cbc-0fe9a12f95bb/table_et_banc_entropie_juillet2013.pdf)
- Ways of using the object

How deep is your source?

Be generous with the documentation. Share everything. Digital files are cheap anyway. And if you need to render or compile the documentation to be readable, share also the source files for the documentation. This is required if you want other designers to make adaptations.

Where to publish your designs?

There are many ways you can distribute your designs. But we strongly encourage that you manage distribution yourself, from your own little corner of the internet or that at least you don't rely on one channel for distribution, especially if that channel is owned by a big corporation which only cares about collecting data from its visitors.

We do recommend that you build your distribution channels the same way you build the objects themselves: collectively. You will find online collectives that will be happy to spread your design and engage in a conversation with you about it.

Open formats

Documentation being a key element, it would do no good for the object and its reach if it required a proprietary application to be accessed.

Open formats are usually standards to store information that can be readable by a human or a machine and of which the specification is publicly available, fully described and exempt of patents and copyright.

Open formats are the only way to garantee a future to your design documents. Any other format would be bound to the willingness of their maintainers to continue to support it. You would not want your life's work to become inaccessible because some company, somewhere, went bankrupt or changed their business model and decided not to support this or that particular feature.

And don't think that the size, popularity or apparent financial wellness of a company is a guarantee of anything.

Tools

Distribution platforms

- http://ibreobjet.org is the online collection of open source product design from the eponymous collective. We're open to submissions if you follow some rules regarding the documention of your project. The source code for the website is also available as open source. So you could just copy our source and use it to build your own collection of projects.
- http://gitlab.org is a code hosting platform dedicated to open source collaboration, but they could also work as a repository for open source designs. The source code of Gitlab is also available, so you can install it on your owr server.
- http://el-recetario.net/ is a collection of upcycling projects and their recepies. They allow anyone to publish projects under CC licenses. The website is built with Wordpress, a popular open source content management system and could serve as a good example of a distribution plateform built with these tools.

Open formats

It would be foolish to list here all the open formats available, some being more popular than others, and new formats being created all the time, but here is a short selection:

- SVG (Scalable Vector Graphics) for vector graphic files
- PNG (Portable Network Graphics), is a standard lossless compression format for raster images

- STL (STereoLithography), a standard format for sharing 3D files, usually associated with 3D printing.
- OBJ is an open 3D file format and the *de facto* standard for exchanging files between 3d applications.
- PDF (Portable Document Format) is a widely used standard to present documents.

Distributed versioning

Git and Mercurial are two distributed source control programs that work similarly. They provide tools such as the versioning of files which have helped coders work together on large projects. These kinds of tools, although more adapted to managing text, should be considered and integrated more and more in a designer's workflow.

Physical distribution

Visit your local fablabs, makerspaces, hackerspaces, micro-factories, local community manufacturers and share your creations. They usually gather large groups of people that could help you distribute your projects further.

Objects

Dobsonian Telescope

John Lowry Dobson (September 14, 1915 – January 15, 2014) was an amateur astronomer and is best known for the Dobsonian telescope, a portable, low-cost Newtonian reflector telescope. –Wikipedia

The dobsonian telescope is a telescope designed for amateur astronomy. It was created in 1950 by the amateur astronomer John Dobson and we could say that it is an open source object, although the terms open source and the open source licenses did not exist at all at that time. It is easily buildable at home using cheap and common materials, and its construction does not require any special ability. Even if there is commercial models available, they are usually modified and customized by their users. These facts encourage the constant refining of the design of the telescope every time it is built.

The Liberator





During the last few years, one of the most polemical issue relative to open source object and their distribution has been 3D-printed weapons, and especially the highly publicized case of the Liberator single shot gun.

The Liberator is a physible, 3D-printable single shot handgun, the first such printable firearm design made widely available online. The open source firm Defense Distributed designed the gun and released the plans on the Internet on May 6, 2013. The plans were downloaded over 100,000 times in the two days before the US Department of State demanded that Defense Distributed retract the plans.

The plans for the gun remain hosted across the Internet and are available at file sharing websites like The Pirate Bay.

-[Wikipedia] (https://en.wikipedia.org/wiki/Liberator_%28gun%29)

The Liberator Gun was a really polemic case. It not only created discussions about the ethics of what could be built using the new domestic 3D printers but also about the distribution of the blueprints and instructions of the objects and artifacts that could be printed.

The controversy created by the Liberator shows the potential of the open source product design being distributed around the world regardless of borders, customs or any kind of territorial law.

http://peerproduction.net/issues/issue-6-disruption-and-the-law/peer-reviewed-articles/regulating-the-liberator-prospects-for-the-regulation-of-3d-printing/

Readymake: Duchamp Chess Set

Readymake: Duchamp Chess Set is a printable chess set based on the version Dadaist artist Marcel Duchamp designed for himself. This printable set of pieces was made by Scott Kildall and Bryan Cera and they shared it on Thingiverse on April 21st, 2014. On September 17th, 2014 they received a letter warning them they were infringing the intellectual property held by the estate of Marcel Duchamp. After asking different lawyers and researching possibile responses, they decided to remove the Duchamp Chess Set from the repository and have asked everyone else to do so.

This is an example of how the open source product design can be censored. http://kildall.com/what-happened-to-the-readymake-duchamp-chess-pieces/

Food for thought

Dobsonian Telescope Amateurs

This model of telescope has been distributed widely around the world and is now the most used by the amateur astronomists. Thanks to the network of Dobsonian telescope owners, there have been many discoveries made by amateur observers, like the Comet Hale-Bopp, discovered by Alan Hale and Thomas Bopp in 1995.

In the text *The Pro-Am Revolution: How enthusiasts are changing our economy and society* Charles Leadbeater and Paul Miller explain how, thanks to the Dobsonian telescope, there is now a symbiosis between professional astronomers and amateur astronomers. Thanks to its openness, the Dobsonian telescope has been improved to a point that makes it almost as powerful as a professional telescope.

Thanks to the open distribution of the Dobsonian telescope, science can advance a little bit faster. When the astronomer Bob Alborzian encouraged Dobson to patent the telescope, Dobson replied "These are gifts to humanity".

http://spontaneousgenerations.library.utoronto.ca/index.php/SpontaneousGenerations/article/viewFile/11947/11185

http://www.demos.co.uk/files/proamrevolutionfinal.pdf

Other platforms:

- http://www.opendesk.cc/ will accept submissions of open designs that can be produced through digital fabrication mechanisms typically found in fablabs.
- http://thepiratebay.se is a popular online index of torrent files, usually
 associated with the mass distribution of copyrighted entertainment material

Entropie

Entropie has published many open source product designs, such as this *Carriole à Vélo* (bike trailer) for example. But they only share the documentation in a single pdf, no other sources attached, complicating and putting a brake on the adaptation prossiblities.

Open questions

- How can you make your object integrate in its design the license and documentation necessary to make it?
- How can you tell the user that the object s/he is using is open source?
- What could be an object that distributes itself?

Economies

Often when we speak about *Open Source Product Design*, people are concerned about how to earn money with their creations. And although these concerns are very understandable -- everybody has to fill their physiological needs and feel safe -- these questions come from a very narrow point of view on how designers can be paid.

Since the beginning of widespread industrialisation and mass manufacturing of objects, designers have mainly earned their living by licensing their designs and earning royalties. In these cases, exclusivity and popularity of the objects are key elements that influence how a designer makes money.

Patenting a design is a costly venture and most of the time will only be profitable if you also have the money to enforce it. Having a patent does not make you instantly rich. And if you think someone is infringing your rights, you will have to go to court to solve that problem and make a case for compensation. As you know, going to court also requires money.

So if I open source my designs, then everyone can make money with it?

Yes. And the other way around is also true, you can make money with other people's open source projects. The shift here is important. If you open source your work, someone else might be interested in it, apply transformation to it, improve it, and this then comes back to you.

Another thing to consider is, since it's so easy to share digital files and since people, with reason, consider that immaterial objects should be free to copy and distribute, there is still a true cost in making material objects. Not only a material cost, but also a knowledge cost in aquiring the skills to manipulate the tools that will help produce the physical objects and an energy cost in moving around the physical objects to their end location. Overall, people are still willing to pay for those costs.

Benefits

Benefits can not always be measured in money. Participating in community ventures, sharing your knowledge, being open to others and shrinking your ego can be profitable for you and your professional project but can hardly be translated into numbers.

And one could hope that what open source practices have done for software, with methodologies such as agile problem solving, iterative prototyping and distributed development, similar approaches could change the face of product design and provide benefits yet to discover.

A second life

Why do you keep so many projects hidden or dead in your portfolio? Who do they benefit? You were been commissioned to create something. You were paid. The client was happy and now the project is in the attic. Unless the client has all the rights over that project or you can't disclose anything from it, why not release it as open source? Maybe it'll be a little extra work. Keeping a project to oneself is easier than making it understandable to everyone, but why not put the effort and give this project a second round. The hours were paid, let's earn something more with it.

Opportunities to explore

Education

Through the organisation of workshops, participation in lectures and any other form of knowledge transmission, a designer can get financial support for developing and growing his/her work.

Education of the buyers and partners is something that should also not be forgotten. Although the benefits of open sourcing your work might be clear to you, this is maybe not the case for your clients or editor. If they understand the concepts and social aspects of open source product design, they might be even more happy to invest in your projects or at least understand what they are participating in.

Services

This is a model that comes from the experiences of open source software economies. Developers of open source software don't earn money by selling the software, but by selling additional services related to the software. For example, Automattic, the company behind the Wordpress blogging platform offers paid hosting for people who don't want to set up and host Wordpress themselves. They also provide services like statistics, anti-spam, backups, etc.

Designers as well could explore these practices by offering, for example, customisations of an open source model.

A user-designer relationship

Just like in other movements, as for example with the delivery of farm products directly from the local farmers to the consumer, open source product designers can leverage their direct relationship with their buyers.

The relation here can be based on longer mutual support, more precise understanding of needs and an improved quality of life by respecting the different partners involved. Cutting the middleman out could also be profitable for both.

Free is not gratis

Free/libre licensing does not mean that you can't sell the product. You can sell your plans and pdf, set up a webshop for it and encourage people to donate money so that you keep on improving what you are proposing.

Crowdfunding

Crowdfunding and open source goes well together, and it might even be the only way this is actually beneficial for all the parties involved. People are always willing to invest in something they find useful and be part of a venture -- especially if they know that they will get something in exchange and that it will benefit a larger community.

Open source as an identity

People like to share. If you give them something they have the right to share, they will happily do so. As such, open sourcing some of your work could be a way to get some attention, or even something to be known for. Your objects might travel further than if you just keep it for yourself and the generosity of open sourcing could shine back on you and the rest of your projects.

Who's building your open source furniture?

Something we havent seen explored in open source product design but that could have some impact in the near future is the importance of the builder in the open source product design process. If the design files and documentation are freely available to download, then what differentiates one object from another is who has built it.

Collectors will always be willing to pay extra for a piece that has been built by the original creator than by someone else. Someone else might prefer to pay a company that is owned by its workers or that has a social model different than traditional captialist ones. The stories around the objects are what give value to them. The value of an object does not lie only in its function and the art and vintage design markets exist to prove it.

Tools

Goteo

Goteo is a platform for civic crowdfunding and collaboration on citizen initiatives and social, cultural, technological and educational projects. Goteo has replicas and alliances in several countries, thanks to its open source code as well as the awards and international recognition it has gathered since 2011. It is a tool for generating resources 'drop by drop' for a community of communities [...]. [Their] mission is tightly linked to principles of transparency, progress and societal improvement. –Goteo.org

Opendesk

Opendesk promises to be a hub between designers and local builders. Their pusiness is built on creating, collecting and promoting open designs (not all open source) and encouraging the local production of those designs through a network of fablabs and makerspaces. They then take a small portion of the price charged to the end purchaser.

Snowdrift

This type of platform encourages participants to provide regular donations to the projects they want to support. Through very small recuring payments and social network effects, creator can potentially harvest a monthly salary, allowing them to pursue their cerative work. https://snowdrift.coop/

Objects

Comingle

Comingle is an open source vibrating dildo that you can customize to your heart's content. It has been sucessfully funded through a crowdfunding campaign on Indiegogo

X-Modules: furniture for Ixelles Library

With *X-Modules*, Maria Solé Bravo and Julien Deswaef have developed a multi-purpose design to furnish the courtyard at the entrance of the Ixelles public library in Brussels. As required by the library, the furniture is made from upcycled material -- re-used pallets -- and was built by neighbours and school children during a series of workshops. The open source nature of the project fitted perfectly with the mission of the library and was one of the key factors that got this project selected after the competition.

« Sur et Autour du trait »

With their series « *Sur et Autour du trait* », Nonpareil sells their open source product designs at different steps of construction. For different prices you can purchase a piece from just the pdf download, a rough build to a classic finish or even order a customization of the object itself.

Food for thought

CUCULA

The CUCULA design manufacture produces and sells premium design objects and as such conveys basic technical qualifications with focus on furniture prodution. In the proprietary workshop, fuelled by active collaboration between refugees, designers and pedagogues, a lively production space is forming, where knowledge about carpentry and design is transferred and where new ideas are being developed.[...] As a starting point, the manufacture is exploring Enzo Mari's 'DIY' furniture program 'Autoprgettazione'. The proceeds of the coming furniture sales will be invested directly in the refugees' education and cost of living. http://www.cucula.org

You Are Not A Gadget: A Manifesto

Some authors have criticized the production of open source services and objects, linking them with the communist movement and arguing that they hinder development. For example Jaron Lanier, an American computer philosophy writer, suggests in his book *You Are Not A Gadget: A Manifesto* that the open source productions generate a kind expropriation of the intellectual productions that he calls "Digital Maoism".

Wikinomics: How Mass Collaboration Changes Everything

In the best-selling book *Wikinomics*, the authors, Don Tapscott and Anthony D. Williams, defend the idea that openess is creating a new form of economic development and, even more, they argue that it will be an essential part of economic innovation and development in the near future.

The economic models described in the book are based on four themes: Openness, Peering, Sharing and Acting Global.

Openness, which includes not only open standards and content but also financial transparency and an open attitude towards external ideas and resources. Peering, which replaces hierarchical models with a more collaborative forum. Tapscott and Williams cite the development of Linux as the "quintessential example of peering." Sharing, which is a less proprietary approach to (among other things) products, intellectual property, bandwidth, scientific knowledge. Acting globally, which involves embracing globalization and ignoring "physical and geographical boundaries" at both the corporate and individual level." –Wikipedia

Designer-to-consumer (D2C)

Some examples of designers-to-consumers approaches:

- http://monoqi.com/en/bestseller-shop.html
- http://www.domusweb.it/en/design/2012/12/17/d2c-generation.html
- http://shop.sylvainwillenz.com/ Sylvain Willenz is a designer with his own shop. Although edited by many brands, he sells also sells his products on his own site.
- http://www.widehandside.com/ A D2C shop from Belgium

Art market

An original Jean Prouvé's school desk at 3000€

Open questions

- What is it that you are selling?
- What do you want to be known for?
- Where do you stand in this capitalist economy?

Proposition

If you've read this book form the start, you've guessed that we are trying to define *Open source product design*. You may have already encountered similar terms such as *Open design, Open making, Open source design* and so on. These overlap each other and sometimes set themselves apart. One might think these little differences are not important, because the overall idea is about sharing. We do not agree with this. It's in the little differences, in the terms and expression we use, that lie the ideals we stand for.

And how could we talk about something if we don't agree on the definitions behind the words we are using. So we have the urge to define a certain number of terms here and in the glossary so that, at least in the scope of this publication, you know what they represent for us.

As product designers coming from the free/libre and open source software movement, we are very picky with some words that have been defined in the software field, especially the term *open source*, which we invariably link to *free / libre*, although that's maybe not the case for everyone. We stand close to the philosophical and ethical ideals of the libre software community.

So, from now on, we hope you agree with us that we should only call **Open source product design** the objects that are properly created, documented and licensed under an open source license (re-read to the chapter about licenses if you're not sure what that means). Fer everything else, pick a name from the following:

Product design

As a verb is the process of creating a new product to be sold by a business to its customers. A very broad concept, it is essentially the efficient and effective generation and development of ideas through a process that leads to new products.

–Wikipedia

Open making

Open making is a practice mainly defined by the community around the website and project called OpenDesk.

[They seek] to define an emerging movement at the intersection of technology, design and manufacturing. [Open design] is an evolving set of principles and best practices on design and production for a collaborative economy. –Open Making

Open design

Open design is the development of physical products, machines and systems through use of publicly shared design information. Open design involves the making of both free and open-source software (FOSS) as well as open-source hardware. The process is generally facilitated by the Internet and often performed without monetary compensation. The goals and philosophy are identical to that of the open-source movement, but are implemented for the development of physical products rather than software. Open design is a form of co-creation, where the final product is designed by the users, rather than an external stakeholder such as a private company.

-Wikipedia

DIY / DIWO

Do It Yourself or Do It With Others approaches focus on making, repairing and globally empowering people to build things by themselves or in a knowledge sharing way. Although we totally encourage these practices, they usually bypass the discussion around licensing, property and access to information. These activities are confined in the grey area of not-for-profit manufacturing and private homes.

Open source design

Open source design is a term coined mostly by the graphic design community. This thus embraces a practice more related to the study of graphical user interfaces for software than its physical counterpart. Maybe this all due to the fact that "design" is such a broad term that applies to any action that involves making decisions or "planning something". http://opensourcedesign.net/

Tools

Wikipedia

This well-known website is a collaborative user-edited encyclopedia. And as such, it's a fantastic tool for an ever evolving consensus on definitions.

Manifestos

A manifesto is a published verbal declaration of the intentions, motives, or views of the issuer, be it an individual, group, political party or government. –Wikipedia

Conversations

There is no better way to define things than to enter in conversation with those who use them. We have so many conversation tools today that it would be a pity not to use them in that sense. So write blog posts and comment under the posts of others. Contact journalists directly to correct them when they wrongly depict a situation or an event. Don't let anyone be wrong on the Internet.

Objects

Piccolo, the tiny CNC-bot

When Picollo was released, it mentioned on the website that the project was open source hardware, although they were restricting commercial use of the project. After discussing with them and pointing the incompatibilities between the restrictive license and the *open source* terms used in the description, the Piccolo team completely freed their project with a CC-BY-SA.

Faircap

The Faircap is a 3D-printed water filter and when it was released, they anounced it as open source while licensing it under CC-NC-SA. After pointing out to the creator why this license was misleading, the project was then released as Public Domain. http://www.instructables.com/id/Open-Source-3D-Printed-Water-Filter/

Food for thought

- Open Making Manifesto
- Critical Engineering Manifesto

Open questions

- Are you satisfied with the term "Open Source Product Design"?
- Are you "free/libre" or "open source"?
- Do you think we need to agree on a definition?

About this book

This book was initiated by Libre Objet and brought to life by a collective of creators and authors during Interactivos?'15 at Medialab Prado, Madrid.

The co-authors present at Medialab Prado were:

- Gaizka Altuna, architect researcher http://m-etxea.com
- ginger coons, researcher http://gingercoons.ca
- Julien Deswaef, media artist http://xuv.be
- Mathieu Gabiot, product designer http://mathieu-g.be
- César García, digital tech researcher http://make.cesargarciasaez.com
- Øyvind Kolås, digital media toolsmith http://pippin.gimp.org/
- Martin Lévêque, product designer https://www.behance.net/martinleveque

This project could not have been possible without the support of Josian Llorente, Jara Rocha, Wendy Van Wynsberghe and the whole team at Medialab Prado.

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hello@libreobjet.org

The source files are available at https://github.com/libreobjet/open-guide

This book has been compiled on Monday, December 21, 2015 with Gitbook version 2.6.5.

About the title

During the whole process of writing, many titles were proposed. Some were more pleasing than others. Some were funny. Some were rude. But somehow we could never settle for one.

Close to the end of the 2 weeks, while we were printing the first versions of it, Øyvind got confused by a typo in the book and made a word become "derived", although the initial author meant "diverted".

Those two words fitting nicely within the practice of free/libre open source design, it seemed a perfect fit for a catchy title with an alliterative twist, and so it's now named *Diverted Derived Design*.

Tools

We used this toolchain of free/libre and open source softwares to bring the book to life.

Etherpad

Etherpad is a browser based text editor that allows many people to write together in real-time on the same page. http://etherpad.org/

Markdown

We used the markdown syntax as its very easy-to-write and easy-to-read plain text format can be converted in HTML while keeping it structured. http://daringfireball.net/projects/markdown/

Bash

Bash is a shell scripting language available on *nix systems. A small bash script was used to download and regularly backup all the texts that were written in etherpads. https://www.gnu.org/software/bash/

Git

Git, today's most famous version control system, was used to keep track of the text changes and to sync those with an online repository held at Github. http://www.git-scm.com/

Sparkleshare

Sparkleshare behaves a little like the infamous Dropbox, but uses a git repository as a back-end. Created by Hylke Bons, this tool made it easier to sync files and folders between computers, while keeping track of changes and without anyone needing to learn how Git works.

http://sparkleshare.org/

Gitbook-cli

Gitbook-cli is an open source software based on Nodejs that transforms a set of markdown files and folders into different electronic book formats (pdf, epub, mobi, html).

https://www.gitbook.com/

Podofo

Podofo is a PDF manipulation toolbox of which Podofoimpose was used to produce a different imposition of the pdf for home printers. http://podofo.sourceforge.net/

Fonts

We use these excellent libre fonts in the book:

- TGL by Peter Wiegel released under the SIL Open Font License 1.1
- Open Sans by Steve Matteson released under Apache License 2.0

Object

There are a lot of ways of printing and binding this book. Below, we explain how we have made it. If you have a different way of doing it, you are, of course, free to do it your way.

We used this way of binding for making our prototypes during the workshop of Interactivos?'15. This version should be affordable for anyone and and requires only common tools.

Materials:

-DIN A4 sized folios (12-20, depending the version of the book) -DIN A3 sized Cardboards -A DIN A3 Printer -A drill for spiral binding or a mini drill -Thread -A needle

Step 1

Print the book in booklet mode. You can use a software like Bookletimposer for sorting the pages in a correct way. Then, fold the folios and make the holes with the drill for spiral binding.



Print the cover in a DIN A3 printer. The cover will be more or less 337x210 mm. You must divide the cover in seven strips. The size of this strips must be 148.5+8+8+8+8+8+48.5=337.



Make holes with the drill for 2nd, 3rd, 5th and 6th strips and them fold them in the same way of the photograph.



Sew all the pages with the cover.



Enjoy the reading

Open Questions

- Have you found a mistake in this book?
- Would you like to translate it?
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It is the result of observing, using and creating digital technologies, free software, the Internet and art. It arose from the « Copyleft Attitude†meetings which took place in Paris in 2000. For the first time, these meetings brought together members of the

Free Software community, artists, and members of the art world. The goal was to adapt the principles of Copyleft and free software to all sorts of creations. http://www.artlibre.org

Copyleft Attitude, 2007.

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Glossary

Amateur

An amateur (French amateur "lover of", from Old French and ultimately from Latin amatorem nom. amator, "lover") is generally considered a person attached to a particular pursuit, study, or science in a non-professional or unpaid manner. Amateurs often have little or no formal training in their pursuits, and many are autodidacts (self-taught).

– Wikipedia

Author

An author is broadly defined as "the person who originated or gave existence to anything" and whose authorship determines responsibility for what was created. –Wikipedia

СС

See Creative Commons.

CC0

Creative Commons Zero is a licence that waives all copyrights attached to a work. Similar to releasing work into the public domain.

CC-by

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CC-by-sa

One of the Creative Commons licences that requires that proper attribution is given to the original author(s) and that any derivative should be published using the same licence.

Сору

To make an identical duplicate of an original. –Wiktionary

Copyleft

A style of licensing in which those redistributing the work are required to do so under its original (or a compatible) license. -Libre Graphics Magazine

Creative Commons

A suite of licenses designed to allow creators and users of works flexibility beyond that offered in traditional copyright. -Libre Graphics Magazine

Crowdfunding

Crowdfunding is the practice of funding a project or venture by raising monetary contributions from a large number of people, today often performed via internetmediated registries.

-Wikipedia

Do It Yourself (DIY)

Do It Yourself is the practice of doing home improvements and maintenance oneself rather than employing a professional. –Wiktionary

Do It With Others (DIWO)

Do It With Others is somehow the social approach to DIY. The idea here is to build things by sharing knowledge, usually in a space such as makerspace or fablab that encourages these practices.

F/LOSS

See Free/libre and open source software

Free/libre and open source software

Stands for Free/Libre Open Source Software. Software which has a viewable, modifiable source. It can be modified and redistributed. –Libre Graphics Magazine

Since free software is often associated with gratis, the "libre" french word is prefered. Open source and free/libre being similar but the later cares about ethics and philosophy behind it.

Free/libre software

A term describing software which is made available under licenses permitting users to not only run it, but to examine its code, redistribute it and modify it. -Libre Graphics Magazine

GNU General Public License (GPL)

A license originally intended for use with software, but now used for other applications. Made famous the principle of Copyleft, requiring those using GPL licensed work to license derivatives similarly. -Libre Graphics Magazine

Hacker

- A person who enjoys exploring the details of programmable systems and how to stretch their capabilities, as opposed to most http://www.collinsdictionary.com/dictionary/english/stealusers, who prefer to learn only the minimum necessary. RFC1392, the Internet Users' Glossary, usefully amplifies this as: A person who delights in having an intimate understanding of the internal workings of a system, computers and computer networks in particular. – The Jargon File
- 2. An expert or enthusiast of any kind. One might be an astronomy hacker, for example.

–The Jargon File

 One who enjoys the intellectual challenge of creatively overcoming or circumventing limitations.

 The Jargon File

Licence

The noun license refers to that permission as well as to the document recording that permission. A license may be granted by a party ("licensor") to another party ("licensee") as an element of an agreement between those parties. A shorthand definition of a license is "an authorization (by the licensor) to use the licensed material (by the licensee)."

-Wikipedia

Maker

A maker is usually a white male with a subscription to Make Magazine. This person could also just be a regular attendee of a makerspace.

Markdown

A lightweight markup language, designed to describe rich text features (styles, lists, links, etc) in plain text files. –Libre Graphics Magazine

Open hardware

Hardware which follows the same principles as F/LOSS, including publicly available, freely licensed schematics. -Libre Graphics Magazine

Open source

See F/LOSS.

Open standards

A standard which is available for viewing and implementation by any party, often at no monetary cost.

-Libre Graphics Magazine

Professional

A professional is a member of a profession or any person who earns their living from a specified activity. The term also describes the **standards** of education and training that prepare members of the profession with the particular **knowledge** and **skills** necessary to perform the role of that profession. In addition, most professionals are subject to strict codes of conduct enshrining rigorous ethical and moral obligations.

-Wikipedia

Property

In the abstract, property is that which belongs to or with something, whether as an attribute or as a component of said thing. In the context of this article, property is one or more components (rather than attributes), whether physical or incorporeal, of a person's estate; or so belonging to, as in being owned by, a person or jointly a group of people or a legal entity like a corporation or even a society. (Given such meaning, the word property is uncountable, and as such, is not described with an indefinite article or as plural.) Depending on the nature of the property, an owner of property has the right to consume, **alter, share, redefine**, rent, mortgage, pawn, sell, exchange, transfer, give away or destroy it, or to exclude others from doing these things, as well as to perhaps abandon it; whereas regardless of the nature of the property, the owner thereof has the right to properly use it (as a durable, mean or factor, or whatever), or at the very least exclusively keep it. –Wikipedia

Pro-am

An amateur who engages in some activity at a professional or near-professional level of skill or competence. –Wiktionary

Public domain

The legal status of a creative work for which the copyright (or other rights restriction) has expired. A work in the public domain can be used by anyone, for any purpose, without restriction. Licenses such as the Creative Commons CCO license emulate public domain. -Libre Graphics Magazine

Steal

To take (something) from someone without **permission** or unlawfully. –Collins Dictionary

STL

A file format for CAD files, geared towards representation of 3D objects. It has become the "de facto" format for 3D printing. -Libre Graphics Magazine