

# OPEN MODELS

**BUSINESS MODELS OF THE OPEN ECONOMY**



*Coordinated by Louis-David Benyayer*



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# foreword

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## OPEN MODELS ARE CHANGING EVERYTHING, ARE YOU READY?

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Software, education, industrial design, data, sciences, art and culture, open models are everywhere. The actors who make use of these open approaches often question the positions defined by traditional actors. Communities frequently organize themselves to collectively solve issues that centralized organizations come up against. Tabby, the car available as an open source kit, Protei, the marine open source drone and OpenStreetMap are just a few examples.

What do these open models teach us? Under which conditions can they develop their impact? What kind of dialogue and interactions are possible with traditional actors? Researchers, entrepreneurs, managers in major companies, designers, experts, writers and philosophers respond to these questions in *Open Models, business models of the open economy*.

## A BOOK OF PAPER AND PIXELS

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Changing one's model is also changing one's own perspective. Place your smartphone next to the book, go to [OpenModels.fr](http://OpenModels.fr) and flip through the pages as you read. With videos, interviews, live comments, twitter threads and votes, the digital side offers you another context, another way of understanding things.

## **AN ENTHUSIASTIC EXPERIENCE OF AN OPEN AND COLLABORATIVE RESEARCH**

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In November 2013, about ten open model enthusiasts met up to pool their understanding on the topic. After a few minutes of talking, they decided to mobilize a larger panel of expertise and viewpoints and to distribute the conclusions of their thinking more broadly. Six months later, there were 35 articles published, 8 events organized, 25 videos produced, 14 proposals presented to the government.

A year later, Open Models is published in French, retracing this open models journey. 18 months later, the book is translated into English by a team of volunteers. All of this under CC-BY-SA license without orders or financing. It is published by Without Model, a think tank whose mission is to foster open, collaborative and responsible models.

# contributors

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This book is the result of a collaborative research led by Without Model. 53 experts contributed giving their point of view, writing articles, setting out or animating events around 6 themes: arts and culture, software, education, sciences, industrial design and data.

You will discover them throughout this book and the website coming along with it, they are experts, researchers, philosophers, entrepreneurs, developers, writers, public actors, activists, corporations managers or designers and they give you their vision about open models.

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*Michel Bauwens, Bernard Stiegler, Gilles Babinet, Louis-David Benyayer, Tristan Nitot, Karine Durand-Garçon, Yves Zieba, Benjamin Tincq, Bastien Guerry, Chloé Bonnet, Célya Gruson-Daniel, Antoine van den Broek, Jean-Luc Wingert, Julien Simon, Camille Domange, Philippe Silberzahn, Hélène Pouille, Sophie Gautier, Justyna Swat, Lionel Maurel, Martin Kupp, Frédéric Charles, Guillaume Crouigneau, Mickaël Desmoulins, Yannig Raffenel, Julien Thérier, Olivier Faron, Alain Rallet, Léo Benichou, Mélanie Marcel, Paul Richardet, Laurent Séguin, Maëva Tordo, Margaux Pelen, Cesar Harada, Christian Quest, Romain Le Merlus, Simon Chignard, Sylvia Fredriksson, Glenn Rolland, Pierre-Carl Langlais, Louis Hamelin, Benjamin Jean, Romain Lalanne, Jean-Paul Smets, Anaëlle Trum, Juan Diosdado, Arthur Pelletier, Simone Cicero, Cédric Ménier Sébastien Broca, Geoffrey Dorne, Kinuko Asano, Thierry Keller*

- Louis-David Benyayer and Karine Durand-Garçon have taken charge of the general organization of this research, have made interviews and organized the events. Antoine van den Broek, Lionel Maurel, Bastien Guerry and Jean-Luc Wingert have supported them all along this path.



- Bastien Guerry has taken charge of the edition of the chapter devoted to software, Lionel Maurel of the one devoted art and culture, Célya Gruson-Daniel to sciences, Chloé Bonnet to data, Benjamin Tincq to manufacturing, Yves Zieba to education.
- Michel Bauwens, Gilles Babinet, Bernard Stiegler, Tristan Nitot, Benjamin Jean, Camille Domange, Julien Simon, Jean-Paul Smets, Sophie Gautier, Laurent Séguin, Yves Zieba, Olivier Faron, Yannig Raffanel, Philippe Silberzahn, Pierre-Carl Langlais, Alain Rallet, Julien Thérier, Mélanie Marcel, Léo Benichou, Martin Kupp, Romain Lalanne, Guillaume Crouigneau, Frédéric Charles, Christian Quest, Simon Chignard, Cesar Harada, Benjamin Tincq have given their point of view during interviews or articles which are presented within this book.
- Romain Le Merlus, Simone Cierco, Glenn Rolland, Sébastien Broca, Maeva Tordo, Margaux Pelen, Justyna Swat, Mickael Desmoulins have participated to round-table discussions during events; their interventions are available as videos on the website.
- Cédric Ménier (along with Juan Diosdado, Anaëlle Trum and Arthur Pelletier) has realized the video movies; Sylvia Fredriksson and Louis Hamelin, the audio interviews. Hélène Pouille has realized the live sketchings during the events. Kinuko Asano and Geoffrey Dorne have realized the book in its paper and digital versions.
- Thierry Keller and the team from Usbek&Rica have taken charge of the edition of this work.

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# **OPEN MODELS ARE CHANGING EVERYTHING,**

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**LOUIS-DAVID BENYAYER**



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## **ARE YOU READY?**

## LOUIS-DAVID BENYAYER

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*As a graduate from the ESCP Europe Business School and with a Ph.D. in Management science, Louis-David has carved out two professional paths, one entrepreneurial and the other academic. He started his career in organizational consulting and before long decided to head down a more entrepreneurial path. He established a strategy consultancy and was involved in several start-up ventures and in the recovery of a company on the verge of collapse. He co-founded Without Model in 2012. He is currently a researcher in the field of strategy at ESCP Europe and ICD Business School and supports many projects, associations and communities.*

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## They are everywhere. Open models are spreading

Some of the most stimulating innovations have emerged from or spread through the use of open business models – the web, Wikipedia and more recently the open source vehicle Tabby.

The web operates by means of free software developed by communities. Open and collaborative initiatives are sometimes more effective and challenge the status held by traditional players in some markets. The French president himself emphasized the importance of open productions in an official declaration on 24 June 2014:

*Social innovation is unique in that it is innovation without patents. There are no patents, no intellectual property, the ideas are copyright free, they circulate. Therefore it is up to us to ensure that no initiative is hindered!*

Open, free, open source...these terms were until recently only used in the world of IT development and quite often to refer to the most technical software which is also the least visible to the general public. As a result there were very few people who were familiar with these models, and even fewer who mastered their subtleties and nuances.

Nowadays, these terms are used in industry (open manufacturing, open hardware), in art (creative commons), in science (open science, open access), in data (open data), and even in governance (open government).

These models are no longer only familiar to specialists, but they are now influencing all economic players:

- › Individuals who benefit from open resources and some who contribute to their creation.
- › Communities that work together to create a common resource (for example, the collaborative map OpenStreetMap).
- › Companies which use some open resources, implement open strategies and again for some, contribute to the creation of an open resource.

## *How does an organization ensure its continuity if doesn't monetize its production and if it authorizes others to use it?*

› Government and state agencies who, via open data, make a resource available that will generate externalities.

Open models are spreading to multiple sectors and impacting numerous organizations. But what are they exactly? What is an open model?

The term was initially used to denote realities that were undoubtedly different, but that could be grouped together in a simple idea, that of opposition to the dominant model in the software industry, the proprietary model. The proprietary model is characterized by restricted user access for use or modification, either for financial (cost of the software), technical or legal (rights to access the program) reasons. On the contrary, free or open software is characterized by greater access to the software (little or no economic barriers), whether to use, copy or modify it.

An open model is therefore a real or virtual product created wholly or in part by individuals who are free to use (sometimes under certain conditions), modify or distribute it. This goes to the heart of the business model question – how does an organization ensure its continuity if doesn't monetize its production and if it authorizes others to use it?

### **Open models' uncharted territory**

In June 2014, Tesla, a company that designs, develops and produces high-performing electric cars, announced its decision to give any company or individual the option of freely using its intellectual property. An astonishing decision from a listed company that has massively invested in research and development.

In 1998, Mozilla launched Firefox and opened the source code of the web browser.

In 2010, with a team of amateur volunteers and in just a few weeks, Joe Justice designed a higher performing car in terms of energy consumption than the market standard. The designs are available and workshops enable to freely assemble the the parts designed by the team.

For 15 years now, Wikipedia has offered an online encyclopedia, controlled and updated by volunteers.

In 2014 French sporting retailer Décathlon, launched an open innovation platform which allows its clients and partners to suggest new products and be involved in their creation and development.

These five examples illustrate the diversity of open models and show that a binary vision (open vs. closed) is misleading. The reality is that initiatives are situated on a continuum going from open to closed.

The purpose of this book is to bring together contributions which represent this diversity. There is no single way of thinking and acting in open models, everything is a question of gradation. This diversity is advantageous and the rhetoric that pits open and closed directly against each other, the activist and the entrepreneur, is misleading. Just like geopolitics, the economy has become multipolar!

Encouraging diversity, nurturing this disruption rather than seeking at all costs to make the whole coherent, seems like a productive path to me.

### **Is referring to a business model when we are talking about free software heretical?**

The term “business model” has been commonly used since the start of the 2000s. But it was the book *Business Model Generation* (Pearson, 2010), which



most contributed to its widespread use. A business model describes the way in which an organization creates value, transfers it to recipients and captures part of it to maintain its operation.

A business model is thus a whole made up of interacting elements (an offer, resources, a mechanism for income generation). What makes it successful is coherence and proper synchronization of these elements, more than the strength of any single one of them.

Take Wikipedia for example, an organization of unpaid volunteers who make an encyclopedia freely available and who receive donations to finance the technical costs of hosting the site. It is indeed the coherence between the type of revenue (donations), the structure (volunteers) and the value proposition (free encyclopedia) which is effective. Changing one of these parts would fundamentally call the model into question. The site's audience (500 million unique visitors per month) would certainly allow it to generate adequate advertising revenue. But it is highly likely that using advertising to generate revenue would greatly reduce the engagement of contributors to write articles for free, and the entire model would falter.

The most "free" models free themselves from monetary questions, they establish themselves on the voluntary and non-remunerated contribution of individuals. The monetization of the whole or part of the product is often perceived as contradictory, even harmful, to the logic behind the construction of open resources.

In this context we sometimes have a tendency to reject the use of "business model" as a relevant term to describe these more open models. All organizations however, even those which base themselves on the creation of social more than economic value (for example NGOs that operate with volunteers) have a business model. A business model describes the way an organization builds and captures value, and not just monetary value. This value can be social, or found in the communication of an image, brand or externality. It is created by resources (material and human) that can be free or voluntary. The value that is built is then transferred to recipients who pay for it or receive it free of charge.

## **The business man and the activist**

All organizations may have a business model but not all business models are equal. In the open models case, two types of business models are emerging – the contributory and the market models.

Organizations that choose a contributory model are mainly driven by an activist and sometimes ideological motivation of free access to knowledge. In actual fact, making an open asset built by volunteers available to everyone enables knowledge or technology to become widely accessible and makes individuals and organizations freer and better equipped to deal with institutions (government or business). Wikipedia and free software are examples of this contributory type. In these models, the knowledge produced is made freely available to the public and is created by individual contributions that are voluntary and non-remunerated.

Organizations that adopt a market type model are first and foremost seeking to meet an entrepreneurial objective (which doesn't prevent some from having activist motivations) such as creating a profitable activity, entering a market, defending a competitive position, improving efficiency or productivity. In these models, the resources necessary to create an open asset are partly financed by the sale of products or services. Open source software models that offer integration services are examples. Similarly, organizations that develop open strategies, but for which the core activity is not to build an open asset, are examples of the market type open model – such as Tesla Motors referred to earlier.

Opening is also a way of accelerating the transformation of an organization. Opening helps develop the ability to explore and lead the organization to create new partnerships or to engage in other ecosystems. Open approaches also quite often mobilize methods that have the power to transform an organization including modular developments, short cycles, etc.

It is in this way that open models create values of a different nature. The value in use is very high for all individuals who use or consume open resources. Direct and transactional values are accessible to companies that use an open resource,

which is often less costly. Value can also be strategic for companies that put in place open innovation and platform approaches. They position themselves very favorably within an ecosystem and structure it to their advantage. For governments or societies, open approaches often generate externalities which although difficult to measure, are very real (for example, Wikipedia's impact on the level of training).

## Mapping the open models

The first conclusion of our work collecting data on open business models is that the “open beyond the open” does indeed exist, to quote Lionel Maurel, one of our contributors. Three areas can be identified: open initiatives, distribution and financing platforms, and players that open part of their model.

In the area of education, this is how these areas could be represented: Khan Academy's free platform of online courses is an open initiative financed by foundations; Coursera (a platform for the distribution and monetization of university courses online) is part of the open models ecosystem; a Business School that launches a MOOC (Massive Online Open Course) is a traditional player that opens part of its model.

Let's get into the details...

## Open initiatives models

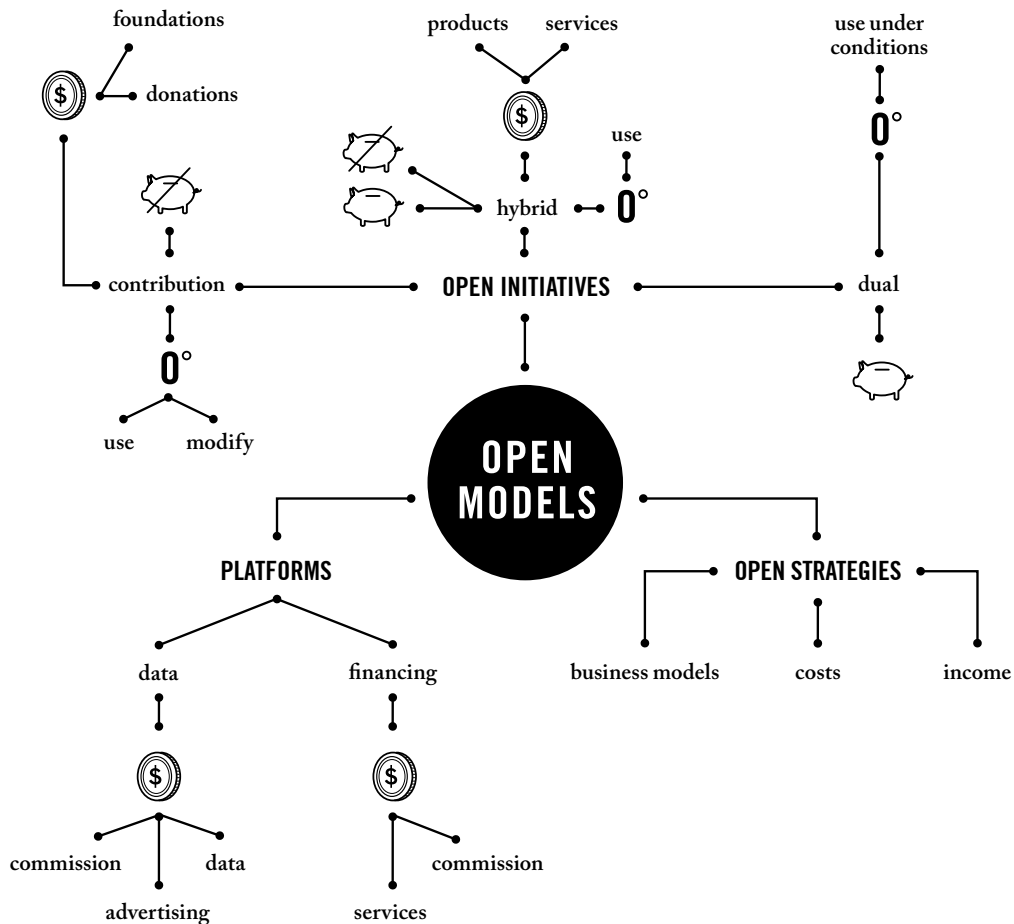
These are initiatives which ever since their inception, chose to be open. They seek to define the feasibility conditions for their project, in particular how to mobilize the resources required to achieve the value proposition offered to recipients. We identified three types of open initiatives models: contributory, hybrid and dual.

The **contributory model** is present in software with Linux, in manufacturing with Protei, and in education with the Khan Academy. In this model, the resources that make up the open asset are provided by non-remunerated

# MAPPING

## THE OPEN MODELS

x - - - - - x



funding



retribution



0° degree of openness

volunteer contributors, or by employees who are paid by companies or individual donations. The recipients have free access to the open asset. No monetization occurs from their use of the open asset (no sale of data for advertising purposes, no advertising banners). The contributors who participate in these activities have other income that provides them with the level of resources they need. Companies or universities sometimes play a facilitator role in that they enable some of their salaried employees to allocate time to open initiatives. It is often companies in the sector that finance foundations enabling open initiatives to operate. IBM finances part of the Linux Foundation for example.

In **hybrid models**, the resources are also provided by volunteer contributors, who are not directly remunerated by the monetization of the open asset. The individuals do however receive an income supplement which is more or less connected to the open asset. This is the case of a lot of software that has been developed and maintained for free by contributors or organizations which then monetize integration or advisory services to companies who use the software. With regard to open manufacturing, it is sometimes the sale of secondary products that generates enough income to finance the teams who work to maintain the open asset. In some examples of open education, it's the sale of ebooks or textbooks which enables the required financial resources to be generated to remunerate the individuals who develop the open asset.

The third type is **dual** in the sense that the asset is made available either free of charge, subject to specific conditions or for specific people, or as a paid version under other conditions or for other people. It is an operational approach often found in the Art and Culture space. Some software is free if the users return modification under the same sharing conditions, and is paid if they are not returned. Freemium models are an example of this type and the monetization criteria varies on a case by case basis.

## **Distribution or financing platforms**

The purpose of the previous models is to build an open asset. In order to be financed, when it is not supported by volunteer contributors, and in particular

to be distributed, this asset often requires a platform. Distribution or financing platforms can be seen in each of the six areas we have explored.

Whether they are generalist or specialist, crowdfunding platforms provide a solution to the financing issue by connecting projects that need financing with a community ready to fund them. These platforms are remunerated via a commission on the financed amount.

Distribution platforms enable content to be read or shared. In the majority of cases, they are established on a two-sided model, where the audience reached by free consultation of content is monetized by marketers using advertising. Usage data can also be monetized. These two kinds of revenue are found in some open science and open education platforms.

### **Openness as a strategy**

The last area of open business models is that of players whose main aim is not to create or distribute an open asset but who open part of their assets or value chain. This practice is more and more common and is represented in open innovation approaches for example.

In each of the areas we have analyzed, there are openness strategies being implemented by traditional players. These initiatives can be organized into three categories according to their value and the players that implement them.

The main impact of some open initiatives is to grow the income of base or reference model. This is the case when a higher education institution produces a mooc. The primary motivation is promotion (to make the institution, its staff and programs known). The expected impact is related to the sales of the institution's base model (student enrolments or company orders for training programs).

Other initiatives enable better use of resources or a reduction in the resources required. They thus have productivity value. These are often the initiatives which

mobilize clients in the design phase (crowdsourcing as in aerospace with Boeing or in the car industry with Mu) or in the value chain production stages (carpooling for shopping for example).

Finally, the primary motivation for some initiatives is to trigger or accelerate the transition towards new business models, often in conjunction with the digitization of activities. This is one way of interpreting the investments some institutions make in MOOCs. It is not only about having a communication channel to sell programs, but is also a way of experimenting with other business models, such as the platform model. In this instance, the value of the open initiative is above all an experimental value.

We must also not forget, as has been previously described, that one of the contributions some organizations make is to financially support open initiatives in their sector, not only from a philanthropic perspective but also because it's good for business (Linux and IBM). Support of open initiatives can sometimes also be used to gain a competitive edge. These indirect openness strategies (indirect, as these groups support open initiatives) sometimes correspond to competitive strategies.

A final openness strategy is that of organizations that use openness to position themselves as players in a bigger chain and to enable other economic players to create value based on the asset that is made available.

The Apple appstore has frequently been described as using this strategy. By making the tools, technical hosting platform and the commercial site for distribution of applications available, Apple has become a platform enabling application developers to build or grow their activity in return for a share of the revenue generated.

These platform strategies (more or less open) are now being implemented in very concrete sectors, and not only in the digital production space.

Tesla and Tabby are two examples from the car industry which illustrate this platform logic.

***It's better to hold 50% of a market  
of one million vehicles annually  
than 100% of a market of some tens  
of thousands of vehicles.***

We already mentioned Tesla's decision to open its intellectual property. In June 2014, Elon Musk announced the following on the company's site:

*"Tesla Motors was created to accelerate the advent of sustainable transport. If we clear a path to the creation of compelling electric vehicles, but then lay intellectual property landmines behind us to inhibit others, we are acting in a manner contrary to that goal. Tesla will not initiate patent lawsuits against anyone who, in good faith, wants to use our technology.»*

This decision might seem difficult to understand coming from a listed company, which raised money partly by promising to capture value through its R&D strategy and patent licensing revenue.

Tesla's decision can in fact be interpreted as a brave strategic movement, yet one that is completely logical from a platform perspective. By opening its technology, Tesla is facilitating access to other players who will help it open up the electric vehicle market. Elon Musk has observed that players in the car industry do not invest enough and have decided not to tip the scales toward an alternative to the dominant combustion engine model. This is evidenced in the very small share of electric vehicles sold (0.41% in April 2014 in France, close to half being the Renault ZOE). As Musk sees it, given that it's not the current manufacturers that are going to contribute to increasing volumes, the emergence of new players must be supported. With this increase in the number of players and in sales volume, infrastructure costs (recharge stations) will be financed across a broader base. In being open, Tesla fosters the creation and development of competition, but more importantly is creating an opportunity



to increase the market's global volume. To make the point, it's better to hold 50% of a market of one million vehicles annually than 100% of a market of some tens of thousands of vehicles.

Furthermore, by fostering the emergence of new players that will use its technology and its products, Tesla is positioning itself as the main player (the platform) in the electric vehicle industry and will be in a good position to capture part of the value created by others by becoming a supplier of parts or material, or by becoming a platform for related services.

On a very different level, Tabby also illustrates this platform logic. In the spring of 2014, a car kit without a car body was released on the market by OSVehicle. The vehicle design is open. Anyone can use the plans, manufacture the parts, and make improvements. By putting in place an open model from the outset, OSVehicle is also positioning itself in a platform logic and aims to become the central point of the economy around its vehicle. By enabling other players to build or develop their activity (those that will build car bodies, assemble the car, develop parts or designs for specific use) OSVehicle is facilitating the development of the client market.

In this configuration, OSVehicle's position will be the platform which will allow all players, depending on their place in the chain, to buy the kits or to offer additional products or services. Exactly as Apple has done with the appstore!

Following the release of this first vehicle, we could envisage that OSVehicle will become a platform for other machines designed by other developers or manufacturers.

## **Future sectors for open models (or not)**

Open models in art and culture, software, industrial design, science and education are shaking up entire sections of our society and this already long list is only a partial one. We can see that other sectors will follow. Some impact us on in an everyday way, others affect us more personally. There are three

areas in particular that are moving towards becoming open: money, the living and health.

Cryptocurrencies are multiplying and becoming alternatives to the monetary system that we currently use, where currency is minted by governments. Bitcoin, Ripple, Peercoin and others are based on very different foundations. In these peer-to-peer electronic currencies, monetary creation is decentralized to individuals and executed by software which is also decentralized.

In the face of seed privatization by players such as Monsanto, more and more initiatives are starting to offer open seeds, freely available for use, with no fee payments or patent royalties. More broadly, the intellectual property and seed license debate is heated at a national, European and international level.

The health economy is built partly on patents, whether for medication or medical equipment. The debate between economic players, seeking to obtain fees to pay off their investments, on the one hand and players in the health industry chain (patients and financiers), who want to improve access to treatment or lower the cost, on the other, has found a new forum for expression in prostheses. Similar to other growing initiatives which are aimed at mobilizing a community, open models are also emerging in this space, to create open source prostheses.

We can see that open models are growing in number, becoming more widespread and gaining ground. The question is no longer knowing where they will emerge, but at what pace they will develop and under which conditions.

— *Translation by Nicola Savage*



## CHECK-LIST BEFORE OPENING

*6 questions to define an open model*

### MOTIVATIONS

Share knowledge - Become visible - Build the ecosystem -  
Produce faster or with fewer resources - Meet a challenge

### CONTENT TO OPEN

A design - data - a process - a brand - a place

### COMMUNITY WHO WILL USE IT AND CONTRIBUTE TO IT

Public at large - partners - clients - an ecosystem - suppliers

### ACTIONS ALLOWED ON THE CONTENT

Use - modify - reuse - distribute - monetize

### MODALITIES AND MECHANISMS

Contribution / Payment balance - Tools - Governance - Coordination

### TIMELINE FOR OPENING

At the launch to co-design - at market release to distribute -  
ongoing to mobilize





## “We have reached the limits of the Fordist model”

**BERNARD STIEGLER**

---

*Bernard Stiegler is a philosopher and evolution of technical systems theorist. He discovered open models almost by accident when he was Director of France's National Audiovisual Institute (INA). Initiator and president of the philosophical think tank Ars industrialis since 2005, Bernard also leads the Research and Innovation Institute (IRI) which is a part of the Centre Georges Pompidou.*

- *Open, contributory and collaborative models are more and more frequent, contribution is spreading to new territories. How do you interpret this evolution?*

- Before answering, there is a prerequisite: one must first understand that all models are not equivalent. Facebook is contributory but in some regards, it is a worse model than its non-contributive equivalent, I almost prefer TF1 (French first private TV channel). These mechanisms of data capture and distortion lead to extreme depersonalization. This phenomenon will worsen with the rise of Big Data. It is at the same time exciting, because data will open up new opportunities, and also very dangerous. This is why I refer to a “pharmakon”.

- *What is a “pharmakon”?*

- In every technology or system, two opposing forces exist simultaneously. One is good, positive, emancipatory and the other negative, predatory. We need to analyze the toxicity of these phenomena because the better they are, the more toxic they are as well. A “pharmakon” always requires therapeutic activity. It has to be transformed into a body to be cared for which, like any medication or absence of such treatment, can kill the patient. Therefore, we have to be able to do this analysis honestly and sincerely, as a chartered accountant does with any company's accounts. The problem is that we do not have the hindsight, training and know-how to be able to deal with contributory models wisely. Today, we need a typology of contributory models. I work a lot with communities of hackers and until the “Snowden crisis”, they did not really see the pharmacological order of the net. Things have changed over the past years, there is a kind of “blues of the net”.

- *How would you define the contributory economy and how do you differentiate it from the market economy for example?*

- The contributory economy is founded on “re-capacitation”: it increases people's ability rather than decreasing it. This term re-capacitation is inspired by the capability approach formulated by Indian economist Amartya Sen. Capability is knowledge – a “savoir-vivre”, a know-how or a formal knowledge – shared with others and which constitutes a community of knowledge. Sen showed that consumerism decreases capabilities. A contributory economy therefore relies on the development of the knowledge of individuals and this knowledge-sharing is facilitated by common ownership which does not prevent its dissemination.

***“I am not against the notion of ownership, but ownership must not prevent enhancing the collective value of knowledge.”***

I am not against the notion of ownership, but ownership must not prevent enhancing the collective value of knowledge. Unlike capacitation, consumer society relies on universalization – even design is universally available nowadays. The contributory economy is an economy based on parity, peer-to-peer. In this economy, we often talk about emerging initiatives or bottom-up. But bottom-up doesn't exist on its own, somewhere there is a top-down, that is, an organization which unites and promotes bottom-up dynamics. When we believe that only bottom-up exists, it is because a hidden top-down is governing what emerges. The real peer is the one able to explain the top-down within the bottom-up.

• *Why is the role played by peers more important today than 20 years ago or than it will be in 20 years?*

• Because it's the beginning of a new era of automation, different in its essence from the previous one. It's the continuation of what started two hundred years ago, but automation is currently going through a change of regime. In many sectors, a workforce is no longer necessary, or will be redundant in the short term. Amazon recently announced that they are working on the elimination of all jobs and their replacement by machines. Currently, all conditions are present for automation to pass the next stage. It is only the costs to develop these new robots which is slowing this inevitable evolution. We can assume that when companies as large as Amazon are making such announcements, then the whole industrial ecosystem will commit to produce enough economies of scale to make robots more cost-effective than humans. When this happens, the Fordist model will be dead. Because with the depletion of employment, purchasing power can only drop. When we reach this point, we will be in a major, violent and systemic crisis. If we do not change the rules now, we will have enormous difficulties in dealing with the situation.



- *These models are developing, but we often have the feeling they struggle to endure and develop. For what reasons?*

- It is true that contributory models' insecurity and high failure rate does raise questions. The explanation lies in the ecosystem, the macro economy. At a micro scale (individuals and organizations) initiatives emerge and spread. It shows that without a macro policy, they cannot fully flourish. When I talk about macro economy, I refer to labor law, taxation, minimum social benefits, and regional infrastructures. All these elements are not conducive to the contributory economy. As long as we do not cause them evolve, there is no chance for contributory models to develop. Otherwise it will be a particular kind of contributory model that will prevail, Facebook is an example. So it is the whole contemporary economic and political project which must be reviewed.

- *Debates on a minimum “basic” income are interesting in this regard...*

- I prefer to talk about contributory income. For me, contributory income must be based on minimum subsistence income, but it should not stop there. Contributory income should be designed to favor individuals' commitment to contributory projects. We have to encourage contributions in order to create businesses that I call social ones – they can be profit-making but don't necessarily have to be.

- *Beyond systems and macro-economy, what tools are available to develop contributory logics?*

- We have to develop a contributory culture and educational system, ensuring that individuals somehow commit to contributory projects, and we are seeing more and more of them. By developing this culture, we will favor individual ability to detect the part of toxicity in this pharmakon that constitutes the contributory economy. On another level,

*“Opening research to other people  
who produce it today will allow us to better  
understand and keep up with events.”*

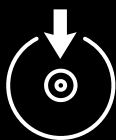
designers have a major role to play. They are to become the developers and guides of these future contributory systems. A fablab is not only working because there is a space and some machines, it works because there is a social architecture of contribution. It is the function of a designer. Research will itself improve if and when it becomes more contributory. The speed of development has increased and the level of complexity has increased so much that we need to cooperate to gain better understanding and analysis. Opening research to other people who produce it today will allow us to better understand and keep up with events, to be more connected with what is happening on the ground.

- *You often talk about a “libidinal economy” to refer to contributory models. What is Freud doing here?*

- Yes, I have a Freudian vision of the economy. The Libido is explained as the social link, the ability to divert our drives towards what Freud describes as a social investment of desire. Drive operates positively when we manage to postpone our satisfaction. Postponing the reaction is about causing action. Libidinal economy is about idealization (in a Freudian sense) and sublimation of drives. We can say that free software thrives on this redirection, this notion of going beyond.

— *Translation by Anne-Sophie Payen  
with the help of Antoine Martin-Regniault*





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*presented by*

**BASTIEN GUERRY**



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**SOFTWARE**

## BASTIEN GUERRY

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*Bastien Guerry is a developer and consultant, specialist in free software and digital education issues. He has been an advocate for digital freedoms since the end of the 20th century, at time when he simultaneously discovered GNU/Linux, the free software movement, and programming.*

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# SEVEN MISCONCEPTIONS ABOUT FREE SOFTWARE

BY BASTIEN GUERRY

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## 1# “Freeware is free software”

**DIAGNOSIS:** This is the most widespread misconception. Two facts seems to support it: first, most free softwares (as in free speech) are *de facto* free of charge, so our minds quickly jump to “free = free of charge.” Next, the English word *free* is ambiguous: it relates to freedom and to cost at the same time.

**REALITY:** 99% of free software is also free of charge and 99% of free of charge software is not free software (as in free speech).

**RECOMMENDATION:** If the software costs nothing but is a proprietary software, say “freeware”, not free software. And take some time to donate to free software, that will make you aware of the fact that they do actually incur some costs.

## #2 “Free software is copyright free”

**DIAGNOSIS:** When people ask what they can do with free software, the answer is often “anything”. Since copyright is associated with what is forbidden, they conclude that free software is free of any copyright protection.

**REALITY:** Free software is either protected by copyright or is placed in the public domain. Copyrighted free software is not without any legal protection. When publishing a (possibly) derived version, obligations differ based on the free license used, but obligations do exist nonetheless.

**RECOMMENDATION:** Never say that free software is “copyright free”, which actually doesn’t mean much. At best, it means “in the public domain”, at worst, that copyright holders implicitly allow you to do whatever you want with their work. But that remains tacit and vague. It is better to systematically avoid using this expression.

### #3 “Free software is written based on an open model”

**DIAGNOSIS:** In 1997, Eric S. Raymond published *The Cathedral and the Bazaar*, and launched the open source movement the following year. The objective was to “de-ideologize” the free software movement started by Richard Stallman in 1983, which is viewed by its founder as a social movement, not a method of writing software. In 2001, the Linux kernel is already 10 years old, and Wikipedia is starting up, to later become the global success we know today. By combining the ideas of open source and crowdsourcing, a “meme” starts spreading: that of a production opened to external contributions with post-moderation, like Wikipedia. And people tend to think this model is the one in use for free softwares, which is not the case.

**REALITY:** Free software is in many cases written by tiny communities, where the driving force is the passion of a handful of persons, rather than external contributions. In the projects where these contributions are significant, the “openness” is relative. At best, it is limited by the ones who are in charge of validating the code, at worst, it is limited by the necessity to transfer copyright to a third party (like for some GNU projects, including GNU Emacs). What is 100% “open” is the possibility to fork the project, which is to create a derived version you can manage as you like, by imposing (or removing) constraints of your choice. This misconception is not completely incorrect, but it is overly simplistic and gives too naive a view of free software.

**RECOMMENDATION:** Practice contrasting the two following facts. Wikipedia: huge community, no pre-moderation and technically virtually impossible to fork. Free software: small communities, pre-moderation by maintainers, and permanent forking possibility.



## #4 “Free software is not user friendly”

**DIAGNOSIS:** This preconceived idea comes from two phenomena. The use of a Terminal, and the existence of OpenOffice. A Terminal is a space where you can interact with your computer by typing instructions instead of clicking buttons. For example, if you type “Firefox” in a Terminal, you get the same thing you get by clicking the little fox icon. OpenOffice was a software that aimed at cloning MS Office functionality. Non computer-savvy people run away when they see a Terminal for the first time, and many willing people end up pulling out their hair when they try OpenOffice instead of MS Office. The end result is that free software is deemed not user friendly.

**REALITY:** Firefox is so user friendly that Safari, Internet Explorer and Chrome copied its functionality. Installing the free GNU/Linux operating system is so much easier than MS Windows and MacOSX, that Microsoft and Apple are doing everything they can to make sure you don’t have to choose for yourself. As an operating system, GNU/Linux is so user friendly that updates happen without making your computer unstable, thanks to a package-based system that is yet to be seen outside of the free software realm.

**RECOMMENDATION:** Have faith in yourself. Do not confuse aesthetics with ergonomics. Set up your computer so that it becomes your friend.

## #5 “Free software was born with the Internet”

**DIAGNOSIS:** The free software movement only became famous when people started to hear about open source, and open source itself happened with the Internet, Linux being the offspring of both. Free software is therefore believed to have been created around the same time.

**REALITY:** The free software movement was born in 1983 when Richard Stallman launched a project to write a free operating system called GNU, short for “GNU is Not Linux”... If one of your aunts was connected to the Internet back then, send me her Caramail address. One can actually say free software was *de facto* in existence even before 1984, wherever the code was freely available.



*Google does not make us stupid,  
it makes us forgetful.*

**RECOMMENDATION:** Practice remembering the pre-Internet era. That is, Google does not make us stupid, it makes us forgetful.

## **#6 “Free software has no viruses”**

**DIAGNOSIS:** One of free software’s “selling points” is that GNU/Linux systems are “safe” and that they don’t get viruses.

**REALITY:** Viruses that affect free systems do exist. This is indeed marginal compared to the proportions it has reached on Windows, but they do exist.

**RECOMMENDATION:** Try to find a GNU/Linux virus and to inject it in your machine. Once you suffer from it, you may believe it does exist.

## **#7 “You cannot make money with free software”**

**DIAGNOSIS:** To receive money, somebody has to give it. Since most free software is free of charge (see misconception #1), it is unclear who would provide the money and even less evident who would receive any.

**REALITY:** Free software would probably not exist if it was confined to non-market exchanges. Money (and lots of it) is constantly invested to write free software, with many business models in use. Maybe you are familiar with the idea of a business model for free software based on selling services... but another misconception is that no other model exists. Reality is richer than that!

**RECOMMENDATION:** Immerse yourself in this book!



### **#Bonus 1 : “Free software is a guy’s thing”**

For the moment, men are the ones who dominate the field of free software at a shocking level of 99%. But this will change. It has to!

### **#Bonus 2 : “Free software can spare us the reinventing of the wheel”**

Yes, theoretically. Except that in practice, reinventing the wheel is lots of fun, and quite educational. Free software believers are certainly not holding back, and this if for the better – as long as the wheel is spinning of course.

### **#Bonus 3 : “Free software is a leftist’s thing”**

If the aim of basing competition on something other than a restrictive view of intellectual property is a “leftist thing”, then yes, free software is that. If requiring companies not to use data in our computers without telling us is a “leftist’s thing”, then yes, free software is as well. If wanting governments to favor computer systems that make it technologically less accessible to the goodwill of its allies is a “leftist thing”, then yes. But, as you would suspect, it is more complicated than that. The “leftists” of the Web are also liberals, even patriots!

— *Translation by Wasfi Jaouad*

# “MOZILLA CREATED A HYBRID MODEL COMBINING CONTRIBUTION, AFFILIATION AND AN AUDIENCE TRAFFIC BUSINESS”

AN INTERVIEW WITH **TRISTAN NITOT** (MOZILLA)

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*Tristan Nitot has been part of Mozilla right from the beginning, and was until 2015 its Principal Chief Evangelist and Firestarter. He is now looking back on his time at Mozilla, its history and business models. How an open source browser (Firefox) reached success and is currently facing huge challenges.*

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**Mozilla was built on Netscape’s leftovers.  
What happened according to you?**

At the start, Netscape was shipping and selling a software which one needed to access the Web: a browser called... Navigator! In the early 1990s, Microsoft understood that the Web and web browsers were becoming a threat to their revenue model, namely that of selling software in shops and selling licenses to computer vendors. On the contrary, the Web allowed a direct and global distribution, so Microsoft’s distribution, i.e.: its business model, was impacted. The company then took advantage of its dominance in the



operating system segment to ship a free web browser, and thus avoid being directly threatened.

Within three or four years, that is the necessary lag to renew the computer market, Internet Explorer, Microsoft browser dominated the market with a 95% share.

### **And then, what happened next?**

At this point, Netscape decided to open source its browser and the Mozilla project was born. On March 31, 1998, mozilla.org site was created. Shortly after, AOL bought Netscape. At this point, there were fewer volunteer contributors ready to work. The AOL “toll road” business model was far from and even incompatible with the initial promises, a real turn-off for volunteers. By 2003, AOL sold Netscape and fired many of its employees.

At the same time, the Mozilla Foundation was created with the help of \$2 million, financed by AOL. There were only 8 employees at the Foundation in Mountain View, California. Here in France, two colleagues and I were unemployed after Netscape was terminated, and the fresh new Foundation did not have enough resources to employ us. We were convinced something was to be done. The Mozilla project was too important for the future of the Internet and it was on the verge of dying. Internet was stuck and locked under control of Microsoft. But we all believed in the promises and high potential of an open Internet.

For example, it was thanks to the existence of a free browser that Linux has thus far survived. In Europe, we had a very large potential for success because there are communities of people who have time, idealists and activists. And we had needs that the Americans did not understand, like having software versions translated into local languages for example. But asking professionals to translate

***“When there’s a piece of you  
in the software, it’s really classy!”***

the software would have been too costly, so we started to organize communities around languages. It worked very well, because the translation was easily accessible to non-engineers. Volunteers were really motivated to drive the potential of such a project (“When there’s a piece of you in the software, it’s really classy!”). Then we adapted the website locally and Mozilla Europe was born. To date, Firefox is available in over 80 different languages.

**So, at the beginning, it was a contributory model: volunteers contributed to the code in their spare time. Nowadays, financial reports by the Foundation mention rather huge amounts. How was this change of scale managed?**

At first we encountered serious cash flow issues. We were selling t-shirts to cover our costs! At the time we were exploring various paths. Could we earn money through training sessions? Helping key account deployment? Developing customized add-ons? The conclusions were the same every time: no model was viable without at least 20 million customers. So we gave up the idea of finding an immediate income source. First things first, the product needed to be a success. We already had “Mozilla Suite”, a browser loaded with features, but it was not that user-friendly.

Firefox was born as a product from a small team of engineers (among which was a French PhD in Physics who we have no news from at the moment) who had a real vision for a great product, which was to simplify and remove rarely used features which unnecessarily adds complexity to the interface. This move was strongly resented by early contributors, because the piece of code they generously provided was at times removed! This is the moment when the extension system was invented. We removed the feature and it was pushed as an extension available for those who really needed it. Since then every browser has adopted the concept and now offers an extension system.

**What was the added value of Firefox?**

When Firefox started ten years ago, one of the new features was a search engine field to search the Web. A search engine was necessary, and we chose Google



because it was the most relevant. Google noticed the traffic originating from our search bar was increasing strongly, so they suggested paying us for the traffic we sent them. This traffic being itself monetized by Google with ads on their result pages. The contract has been renewed ever since\*. But we also contracted with other search engines. All in all, we can provide our software for free while we fund the project, employee salaries and volunteer expenses.

## **And what happened to Mozilla Europe then?**

Mozilla Europe was an independent entity, which we merged into the Mozilla Foundation 10 years after its creation. We signed (simply online!) affiliate contracts with Amazon France, Amazon England and Amazon Germany, and all in all it made a pretty good financial reserve. It worked that way until it became obvious we ought to pay income tax on the revenue generated. Contracts then were associated with an US company which is subject to income tax, namely Mozilla Corporation. It is a 100% Mozilla subsidiary. So we could keep our status as a non-profit as well as non-profit governance, while complying with tax regulations. Our annual turnover was over 300 million dollars at the time. Later on, Mozilla Europe activities were integrated in the Mozilla Foundation and Mozilla Corporation, which allowed us to hire more than 150 employees in Europe.

**So resources are huge and regular but they come from a very limited number of customers and sponsors. Is it a problem?**

**How can you diversify your sources of income in the future?**

The proportion of Google in our turnover is not a comfortable position even though the contract explicitly states that buying audience gives them no right of decision on product evolution.

This is the reason why diversifying income is somewhat of a hot topic for Mozilla. As you can imagine, the community is not ready to accept any kind of decision. One of our recent announcements was an awkward move and was perceived as an attempt to push advertising in Firefox. There have been fierce reactions and we

*“Our employees are among the best in their field, they are offered very attractive positions by Google and Facebook to mention just the big ones.”*

were led to declare that we were instead envisioning more discreet ways of showing our partners. I am sometimes asked whether we would consider crowdfunding. It is worth considering but it will not be a major resource. We are funded today with several million dollars a year and up to now no one has ever collected such a sum via crowdfunding. Generally speaking, it is not that easy to innovate within huge companies like ours in terms of the business model. At Mozilla, innovation starts in tiny teams which grow little by little until it becomes obvious. It takes time.

### **What are the licenses in use for Firefox?**

Our software is released under several licenses that guarantee the largest possible openness: GPL, LGP and MPL (Mozilla Public License, protecting us better than software copyright) and that allow collaboration: code is open, you can download it for free, which is a requirement for collaborative work. Every additional code is done under the same license. Only the Firefox brand name is not free because it is a trusted brand. You can copy, sell and modify everything you want, but you cannot call it Firefox.

### **What is the balance between voluntary contribution and employees as far as production is concerned?**

Mozilla has about 1000 employees and 30,000 accounts, that is to say 30,000 individuals who have at least created or commented a bug-report. These are our contributors.



Obviously they take care of code, bug-reports and bugfixes. An estimated 37% of code is produced by volunteer contributors, the rest is from Mozilla employees. Contributors also play a major role in promotion with hundreds of them in charge of organizing events and having access to a marketing budget. Our employees are among the best in their field, they are offered very attractive positions by Google and Facebook to mention just the big ones. Some former Mozillians are now developing Chrome (Google's browser) or safari (Apple's browser). It is a challenge for us to attract and keep talented people. They often come to us because of the project, because of Mozilla's independence, and also because they are attracted to the thrilling working environment, where there is lot to learn. It is hard to keep them because we do not offer stock options, while they sometimes are offered millions of dollars by our competitors. Some of them cannot resist.

— *Interview by Karine Durand-Garçon*

— *Translation by Jean-Bernard Marcon with the help  
of Antoine Martin-Regniault*



# DRAW ME AN OPEN MODEL, PLEASE

INTERVIEW WITH **SOPHIE GAUTIER & LAURENT SÉGUIN**

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*For this interview, Bastien Guerry role-played The Little Prince\*. In the role of Saint-Exupéry: Sophie Gautier (The Document Foundation, who is behind Libre Office) and Laurent Séguin (Association of French-Speaking Free Software Users). Draw me a free model, please.*

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## What is your favorite free software business model?

- **Laurent Séguin:** If the software is entirely community-based, for example when it is backed by a foundation, the user can advance his or her knowledge of it on their own (or via an external provider to do it in their name), thus contributing to its development by working with the developer about his/her operational needs. This way, the user helps the software's long-term usefulness by providing code or by orienting the road-map towards industrial applications. If the software is produced by a publisher, the user will be in a permanent dialogue with the vendor, and thus contribute to the financing of maintenance and R&D for later users. The user can also consider improving his own coding skills to directly take part in the maintenance effort and code production, in collaboration with the vendor, to the point of becoming technologically completely independent – being careful at the same time not to exhaust their financial resources, allowing the vendor to remain innovative. In any case,

\* Famous French writer *Antoine de Saint-Exupéry*'s most well-known novel, published in 1943. Fourth most translated book in the world



users should understand that choosing a free software is an investment worth protecting, not just another IT expenditure. This protection should cover the software itself as a technical tool (sustaining the freely available code), and should also target all those who are involved in making it better (sustaining know-how and innovation). I think that the human and financial implication for the users – depending on how critical the software is to their activity – ultimately constitutes *the* best model.

- **Sophie Gautier:** Laurent just read my mind! In short, the best model is an ecosystem where the users take part in the development of the software, one in which companies can help technically by contributing to the source code, otherwise, help can also be provided by directly financing the project.

### **What are the attractive business models that *do not* actually work?**

- **Laurent Séguin:** It depends on what you mean by “do not work”. Do you only care about revenue streams, or are you also considering the implications that free software entails for users. If you only measure revenue, then all models work, because you can make money with any one of them. Establishing multiple revenue streams simultaneously generally allows enough resources to keep the project going. For instance, mainly collecting revenue through support services does not mean you overlook selling stuffed animals [if you can]. However, any software vendor who thinks about financing R&D by only selling support services should be careful. When a vendor tries to be competitive with service prices (as expected by clients), service revenues tend to only cover service costs, and do not necessarily allow for any extra to finance code development as well. Fortunately, France has plenty of aid schemes in support of innovation, like the *Crédit Impôt Recherche* (Research Tax Credit) which allows them to continue investing in their R&D. If users’ freedom is what matters (truly free software, not any “shareware” that is half open-source), then models that restrict users’ freedoms do not work by that criterion. By that token, The AFUL (*Association of French-Speaking Free Software Users*) advises all companies enticed by this type of software – which can be technologically very good and actually fulfill their needs – to be very critical with the open-source

***“Users should understand  
that choosing a free software is an  
investment worth protecting,  
not just another IT expenditure”***

— *Laurent Séguin*

speech from vendors and to treat these solutions as they would any other of the vendor’s non-free software products.

The big failure in the free software economy lies in the competition between service providers and software vendors. Too often the former monopolize revenue sources, forcing the latter to protect themselves by limiting freedoms offered by their software in order to force service providers to pay them part of the revenue generated through the software. That explains in part why the freemium model is so highly favored by software vendors. From my point of view, only the users can reconcile these two actors. Either by asking for services related to separate areas, or by forcing service providers to get reinsurance from software vendors. The AFUL (users’ association) works hard on these aspects with major customers. Even if it ultimately makes for increased fees, it is in the user’s best interest to make the one who creates and maintains the code as sustainable as possible (and the one who integrates the software into their computer systems as well).

### **What are the emerging business models that appeal most to you?**

- **Laurent Séguin:** Involvement by users who understood that choosing a free software – a truly free one – is an investment bringing about competitiveness gains that are worth protecting, not simply an additional operating expense.



- **Sophie Gautier:** The pooling of users to finance specific functionality with regard to their business needs. And in any case, their involvement as actors, not just consumers, not only for the code itself, but also in the entire chain of free software production (quality assurance, localization, documentation, infrastructure, etc.).

— *Interview by Bastien Guerry*

— *Translation by Wasfi Jaouad with the help of Antoine Martin-Regniault*

# “FREE SOFTWARE IS AN IRREPRESSIBLE URGE TO TRANSMIT AND SHARE KNOWLEDGE”

INTERVIEW WITH JEAN-PAUL SMETS (NEXEDI)

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*Jean-Paul Smets, CEO of Nexedi, publisher of the free software ERP5, generates 90% of his business from export. Fifteen years ago, he co-authored a book whose title speaks for itself: “Logiciels Libres. Liberté, égalité, business(Edispher, 1999)\*”. Today, he still believes in free software and tells us why.*

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**What are the business models of free software that work?  
What are the most and least favorable areas for free software?**

More than ten years ago, I wrote a book with Benoit Faucon about the free software economy. My goal was to promote free software to confront Microsoft’s absolute domination. I was, and still am, a big fan of free competition. The existence of a business model is for some executives what makes something acceptable that would otherwise not be. My goal was however to promote free software so I wrote a book for those executives that have this perception of the business model being the foundation of all human exchanges. In fact, doing so is as grotesque as considering business models the reason for sensuality: one does not make love because there is a business model. For example, few years ago,



Redhat's founder described his business model being like the one of the water delivery business, bringing gallons of water to his final clients. Saying that, we have moved the focus to the business model of bottling water rather than to why water flows from springs. Ten years after the writing of the book, what's interesting for me is to know why water flows from springs.

## **What is the purpose of a free software?**

It is not to respond to a financial need. Mainly people that do not have income problems produce free software. In developing countries, when feeding your family is an issue, some free software production exists, but on a much smaller scale. Since Shanghai has become a rich city, we notice that a small production of free software has begun. In fact, the free software producers' geography is pretty similar to the OECD's. The free software is initially based on a need to contribute to knowledge. It is an irrepressible urge to transmit and share knowledge. Of course, this need also exists amongst the more modest, but it certainly has less space to express itself.

## **The production of free software lacks of incentive. To finance this production and for it to last, what business model is best suited? How do we fund the R&D of free software on the long term?**

This desire to produce free software might be important enough to make someone decline a doubled paycheck offer by Google. At Google, a developer is very well treated, fed, and even bathed like a child.

Materially speaking, it's interesting for the developer, but they contribute less to program sharing than in a free software company.

So the discussion around free software business models must be balanced by the recognition that none of these models explains the irrepressible desire to produce free software. Without this willingness, there would be no free software. Free software development goes on and on like when a researcher wants to continue his research and to produce articles on his discovery. Very few researchers give

up and lose their desire to contribute and share about it. As for R&D funding, I remember what Richard Stallman said 15 years ago: “it’s simple, do consulting in the morning to pay the bill, and program in the afternoon”. This may seem unsophisticated, but it’s ultimately what works best. This model is by far the best and the simplest. It is sustainable and stable whatever the size of the company.

## **Is it possible in France?**

This model is often used individually in Germany, much more than in France, since the German tax system is more favorable for young freelancers. For a freelancer in Germany, one week of work funds a monthly wage in Germany, allowing for 75% of his time devoted to R&D. In France, a JEI (Jeune Entreprise Innovante/ Young Innovative Company) can easily spend 50% of turnover in R&D with 10 employees. That allows the easy creation of stable free software publishers. After 7 years the company is recognized on the market and it becomes possible to slightly raise prices thus stabilizing income and allowing the employer’s social security contribution costs to be paid while investing in R&D. Other models have arrived since, but for me, these models lead to the corruption of free software.

One day, some big players in need of comfort (eg. Bull, Cap Gemini...) wanted to compare the quality of existing open source software so they anchored quantified comparison criteria. Rather than comparing software with each other, like kitchens chefs would compare gastronomy (we know what good food is when we’re used to eating well), they compared numeric criteria. One example of those metric measurements that has been recognized by the market is the measurement of the size of the community.

## **How is that a problem?**

The first drawback of metric measurements is that they are linked to the idea that “I am no longer part of the community, others are”. For example some of our clients ask us “could you make your community grow?” and the immediate answer



we get when we say “yes, sure, come on, join us!” is “oh no! Not us!” To be more precise, in certain areas of free software the community is clearly “others” and in other areas, the community is “I”. Regarding infrastructure softwares, like a kernel network module, “the community is me”. And both giant web/telecom companies and small groups of individuals, like Nexedi, see themselves in this “me”. All these companies desire a reliable Linux kernel, one that doesn’t crash when deployed to give a customer a service. This way there will be no hesitation for companies to contribute and patch into the correction of critical defects. What lies behind this logic is the basis for the access to knowledge, contribution and sharing. Why do we use free software at Nexedi? Because if we encounter a bug we will be able to fix it, provided we put in the necessary effort. Free software is a technology where nobody will prevent me from fixing bugs. In other areas free software is also often misunderstood in thinking that “the community, is the other”, especially in business management applications like ERPs. There are just few pioneers that think that “the community, is me”. By the way, this backwardness was analyzed by Brian Prentice from Gartner in his article: “Open Source & Business Apps – Is There a Disconnect?” For business applications software, big companies have not yet realized that it is their role to create the community by sharing non-confidential management processes, in addition to the software.

### **Is it the only drawback?**

No, a second one with this idea of community size is that capital can be used to acquire it. “Since we measure a software’s quality by the size of its community, let’s use capital to acquire it entirely!” It’s easy. We go to conferences, we sponsor events, we build up a good image by giving the opportunity for others to express themselves then we hire talented and well-known performers for some rewarding missions and in doing so everyone will know that this famous guy works for this company etc. Capital becomes the instrument to quickly build up a community. Developers who, ten years ago, were managing and financing their communities the hard way by selling tee-shirts for example, now receive sponsored goodies and cookies during developers’ conferences. So saying that the size of the community is a so-called “quality criterion” gives an advantage to capital based business models while small structures with no capital or other goodies become invisible on the market.



*“Developers who, ten years ago, were managing and financing their communities the hard way by selling tee-shirts for example, now receive sponsored goodies and cookies during developers’ conferences.”*

### **Once again, isn’t this a French trend?**

In France it became rather difficult to sell free software because of our sensitivity to marketing and slick looks. On the contrary, in Germany and Japan much more importance is given to free software. For instance in France Cloud-Watt has never looked at SlapOS, which nevertheless has been functioning since 2010. A Thales executive once tried justifying this fact: “if your software was good, it would have been known in the US!” Let me highlight that market structure is very different between France and Germany. In France the free software market is dominated by few integrators: Smile, Alterway, Linagora, and OpenWide which could also be software publishers like Linagora. These actors mostly integrate US-based free software promoted by strong marketing because French buyers give attention to American software and their marketing. “If your software was good, it would have been known in the US!”... Everything is revealed in this sentence.

### **You also mentioned Germany?**

In Germany, there are regional companies with regional customers, and they make well-targeted small free software, well maintained and of good quality, that one can use outside its original region. Over there the market is very fragmented while in France there is a strong concentration around few actors.



But the most annoying thing with free software publisher companies receiving capital to fund their marketing and accelerate the acquisition of their community is that they no longer produce free software. They have a showcased free software and they sell a proprietary software. Believing they are buying free software, customers will in reality buy proprietary software and that ruins all the perceived benefits of free software, like being able to fix bugs and improve the product we selected. “Open source” uses this ambiguity. Ultimately, thanks to clever marketing around open source, the client understanding of what free software actually is is far from the real one which provides the ability to fix bugs independently. The “Cigref”, for example, spoke of Gmail as an “open source” product!

### **Why do you think that community size being a measurement of quality is a myth?**

What really is the community in free software? Of course there are big communities such as Debian, which have nothing to do with marketing-funded communities. Debian can rely on a large community because it ensures packaging of tens of thousands packages, bricks relatively independent from one another. But in most free software community is rarely composed than more of 5 people. GRUB, the most used free software in the world is the boot loader used to boot Linux, Windows or BSD. GRUB’s community is only of three to five people. Developers of the heart of a file system project are a single person. When the only developer of ReiserFS was sent to jail, his software died. The new Linux Btrfs file system took three years to be developed and only one person was able to finish it. In short, in most cases, the heart of the community is composed of maximum 5 people, a hundred who produced a few lines one day and thousands fussing over it.

### **How do you see the future of free software?**

One thing that I am sure of is that all business models consuming capital threaten free software. To be more specific, a company whose field is not related to free software and whose development requires capital (but which uses free software

to develop itself) often contributes positively to the free software ecosystem. But in a company whose business is to produce software, capital often kills free software. As soon as existing companies in the free software space started to get their funding from venture capitalists, the balance between Europe and the United States in the success of free software has been broken and the very idea that free software has advantages faded. Why? Because the true free software became inaudible against well-marketed software companies financed by venture capital. Cloud computing, as a capital-intensive business model, is a significant threat to both free software and proprietary software. Developers who get offers of doubling or quadrupling their salary find it hard to resist. This is what happened in Japan, where Google hired two-thirds of the free software community. This also happened in France, to a lesser extent, with clouds named “sovereign”. One can conclude that the existence of free software is based upon the fact that people accept to earn half their salary to work at least twice as much, simply to satisfy their urge to produce free software.

— *Interview by Karine Durand-Garçon*

— *Translation by Dominique Pasquier with the help of George Husni*



# “TWO POSSIBLE SCENARIOS: INDIVIDUAL EMANCIPATION OR THE STRENGTHENING OF A CENTRALIZED AUTHORITY”

INTERVIEW WITH **PAUL RICHARDET** (NUMA)

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*Project Manager at Numa, Paul Richardet contributed to the emergence of La Cantine, a Parisian space dedicated to digital innovation. A privileged witness to free, open and collaborative initiatives, he paints a picture of the main trends at work in the free software arena, which has great assets to successfully strive and endure, as long as it is mature.*

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**Free and open initiatives are growing at unprecedented scale. They are now reaching far beyond software itself. How do you interpret this development?**

Generally speaking, social groups are oscillating between a centralized concentration and dealing with reality and individuals. Open and free initiatives in the last few years have, therefore, naturally been created in this “alternating current”. Economic entities have become strongly centralized over the last thirty years in the context of globalized networks. Resulting at first from mergers following financial operations, these vertical integration phenomena have been amplified by the use of digital technology and the centralization of information owing to

the dominant role of the I.T. department and its total control of the central server's management rules. More recently, this has been countered by the Web 2.0 phenomenon, which gave some power back to the final user, allowing them to contribute online, in an independent fashion. The ramp-up of the cloud, a marker of this new era, brings about everything at once: better access and ease-of-use to the individuals, and, simultaneously, increased power to the platforms managing the server farms. Major players in the digital world (Microsoft, Oracle, Facebook, Amazon or Google) are illustrations of this situation and of the different positions it allows.

### **How can this contradiction be explained?**

At first – in an economy that is now globalized – decision making has become less and less concerned with the individuals, whether they are considered users, consumers or citizens. Even though information technology was making tools more powerful, improving network management and data transfer, individuals were finding themselves more dependent and more limited than before. This transformation led a natural response from these individuals who showed a desire to retake a more effective role, to once again become active players, contributors, and decision makers. The economic crisis, whether feared or actually suffered, did play its part as well. The natural response of individuals was to (re) build communities and local networks of solidarity, compensating for the central institutions' inability to always achieve such detailed coverage and network density. That partly explains the rise in the number of collective and community-based initiatives, whether they are said to be free, open or collaborative. It is worthwhile asking how such practices – often derived from the software world – will evolve. It seems that there are two possible scenarios, either individual emancipation, or the strengthening of centralized capitalism.

### **Which initiatives, in the free software arena, look most noteworthy to you?**

Three of them easily come to mind: Mozilla, LibreOffice and OpenStreetMap. These three organizations are quite different, but have one thing in common.



With determination from the community they could, in a very short time, compete with, and eventually challenge the dominant market players in their respective fields.

**Mozilla** was founded on the desire to have an independent web browser. It started with a small team, and thanks to a community helping with development, communication and support, this web browser is now a key solution.

**Libre Office** is the free alternative to Microsoft's proprietary suite. Coming from a fork created when Oracle bought out Sun, this software enjoys a global network of support, with contributors located in many countries worldwide. In this case too, a community of a few hundred members succeeded in maintaining and developing this software to a very high level.

Finally, **Open Street Map** is challenging the dominant players in the map market. Its strength lies in its ability to offer base maps which anyone can contribute to with no subsequent rights limitations, all this enhanced with data provided by the community. Unlike the other two examples, its founders are not all software developers, many were passionate about other subjects (birds, restaurants, spaces open to disabled people, etc.) and decided to document these subjects on the maps and provide information usable by other people. Maps provided by OpenStreetMap are then freely usable by anyone. Being more informative than their direct competition, these maps are now setting the standard.

### **How did these organizations manage to finance their growth? What are their business models?**

Business models are quite different. Mozilla runs on community energy, of course, but also enjoys significant sponsor funding, especially from Google\*. Let's not be naive, though: Google's motivation is first and foremost to stay competitive, and we can think of this support as a means of countering Internet Explorer (Microsoft), and also pushing for Chrome, making it the main platform of mobility, particularly well-suited to Google's tools. LibreOffice

***Open and free small organizations  
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service they can to exist.***

(historically, OpenOffice) has a model that bears a resemblance to Mozilla's, for it was originally supported by significant economic players in the sector (especially Sun Microsystems) who brought their own contributions. Since the fork, LibreOffice is also supported by users (foundations, research centers, universities,) who want to maintain a measure of independence from the main players in the software world. This is for two reasons, independence as a principle, and to make sure their needs are better addressed. Their model differs from Mozilla's in that LibreOffice consists of a sort of a cloud of local entities that are more or less legally structured, with strong individual representations. Organizations wishing to help LibreOffice then do so mainly by setting aside some people to work on the software.

### **What about OpenStreetMap?**

OpenStreetMap offers a slightly different model. It relies mainly on crowd-sourcing, like Wikipedia, with individuals enhancing the maps with their voluntary contributions. There is yet another business model in the free software world which is that of the IT services companies. Some are specialized in free software, which they make easier to use for some companies through training, developing of specific modules, or by helping with the deployment. They use open source blocks that they assemble and deploy for their customers. In general, they give back to the community whatever specific developments they carried out. The fact that main corporate entities benefiting from free software, and companies using it, are giving back to the community, remains a subject of permanent debate and controversy.



**This goes to show that proprietary software companies and dominant economic players are directly or indirectly present in these free initiatives. How can this contribution be explained when it goes against their base model?**

There are actually two reasons. The first is linked to their ability to rapidly innovate, the second to competition. Big companies often have difficulties leading disruptive innovations, their internal organization do not make it easy for them. Incentives to stick to the reference model or product are so high as to not leave any room for a divergent new product. These companies are understandably reluctant to develop a new solution that could be perceived as direct competition to their flagship product. Moreover, they are not eager to disrupt the stable reputation they have with their customers. On the other hand, open and free small organizations are forced to identify a niche where they have to deliver the best service they can to exist. They have lightweight structures that make them more agile, and they attach more importance to intuition. Horizontal organization makes it easier for them to mobilize contributors to satisfy the identified expectations. By getting closer to these agile organizations, the big companies have access to a fertile source of innovation in terms of the nature of the products, organizational modes, and need identification.

The second reason has to do with the fierce competitive forces these players wage on each other: Microsoft, Oracle and Google for example are each in very strong positions. Among the weapons used to fight these wars, alliance with a free software player can prove to be a decisive one. Like the support Google offers Mozilla, for instance.

**Between the scenarios of emancipation and centralization, which factors will favor one or the other?**

A persistent seesaw dynamic permeates innovative technologies, like an alternating current. In an initial phase, the existing paradigm is to be disturbed, needs are to be brought forward, and services adapted. In a second phase, the main players buy or develop these new building blocks to be included in offered



products and services until the next iteration begins, and so on. Free and open initiatives are therefore playing an essential role in this permanent “grand recycling” of ideas, services, and technologies. However, the way they operate being often informal, and their organization being sketchy at times, they have hard time positioning themselves as a stable reference in comparison to a more institutional company. As a consequence, they also have trouble playing a mediation and stabilization role in economic and social relations, like the role played by trade unions, consumer organizations, recognized experts who are relied upon to settle disputes and ease socio-economic tensions. In this broad deconstruction/reconstruction process, we often realize that even the most elementary individual rights have been simply forgotten, or subjected to distant, if not exotic jurisdictions. In this close and direct relationship that ranges from the very centralized and remote to the most dense and local coverage, one can ask if a new level of mediation and consultation is missing to better channel and dispatch rights and duties, financial flows, social and work relationships. Everything is on the table: between the voluntary chaos happily practised by the free culture, and the state of absolute exception represented by the NSA, where can the new rule of thumb be found? The question that arises is exactly that of the relationship between the weak and the strong. How can a balance be reached there? Who will be in charge of the mediation between the free individuals and the meta-organizations?

— *Interview by Louis-David Benyayer*

— *Translation by Wasfi Jaouad with the help of Antoine Martin-Regniault*



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*presented by*  
**CHLOÉ BONNET**



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**DATA**

## CHLOÉ BONNET

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*Chloé Bonnet co-founded Five by Five in 2013, an innovation agency specialised in rapid prototyping. She also co-founded the Parisian branch of the Open Data Institute, an international organisation which promotes the culture of data, created by Sir Tim Berners Lee, inventor of the Web. In 2008, Chloé joined Naked – a New York based consulting firm. There she discovered the efficiency of design thinking methods applied to marketing. In 2011, she decided to bring her know-how back to France. At June21, she designs and oversees digital transformation projects. Chloé is a graduate of Sciences Po Lyon and the CELSA.*

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# OPEN DATA: FROM THE KILLER APP TO THE PLATFORM ECONOMY

BY **CHLOÉ BONNET** (FIVEBYFIVE) & **ROMAIN LALANNE** (SNCF)

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*What would Gameboy have been without Tetris, Wii without Wiifit, and Windows without its Office suite and Facebook without its instant messenger? Each platform has built its success around one application, the killer app, the one which in and of itself justified the purchase or adoption of the platform. Where are the killer apps born from open data? Behind this persistent question, one continually repeated from the outset of the movement, lies a deep misunderstanding regarding the true value of open data. It is as if the open data business model only exists in the creation of revolutionary mobile applications.*

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Let's gladly admit that we are to blame – this biased vision is in fact partly due to the open data players themselves. In order to facilitate education, they set out to describe a one-way model, which would naturally flow from data producer to mobile application developers who reuse these data.

Yet with hindsight, and a few years of maturity later, it is now easy to see that economic viability of mobile applications is more often the exception than the rule. Also, that open data business models are most often found in service platforms which facilitate the meeting of producers and reusers of open data.

This model is definitely less attractive than the promise of the killer application. But it is also infinitely more robust and realistic. We will now explore the basis for this model.

## **Redefining the “value” of data: from stock to flows**

As an intangible non-rival good that can be endlessly duplicated, data does not have a real value in and of itself. If a developer or a data center consumes an extra datum, this usage will not mean that one additional unit will be deleted. Quite the contrary in fact. The reuse of a datum creates new data - the renowned “metadata”.

The value of data is thus multiplied in the flows and exchanges rather than in stock and accumulation. Logically, it is from the orchestration of these flows that new open data intermediaries position their business models.

## **The rising power of intermediaries**

The fantasy of the open data killer app is based on a simplistic vision of the data producer/consumer relationship and of the nature the flow that unites them. It leads one to believe that this is a one way and unilateral flow between two parties, completely obscuring the technical foundation that conditions reuse. Yet this intermediary link is increasingly needed in the value chain. These service platforms that position themselves between the producer and the reuser consolidate and accelerate the potential for open data innovation by simplifying access to transformation and consumption of open data.

***The value of data is thus multiplied  
in the flows and exchanges rather than  
in stock and accumulation***



Even more so given that the economy of these intermediary platforms also provides a data producer with the opportunity to integrate the enriched, cross-referenced and transformed data for themselves. This is what we refer to as a “feedback loop”. The boundary between data producers and users thus becomes porous and blurred while at the same time the intermediary positions itself as a critical element in the ecosystem.

### **The prevalence of the freemium model - how to reconcile free data and platform economics?**

Intermediary service platforms built from open data are oriented towards the producer and/or reuser. For the producer, they simplify publication and encourage use, in particular by working on the interoperability of formats. As a reuser, they offer a huge range of services which optimize data consumption (data standardization, API, cloud based hosting, customization, etc.).

Even though several business models coexist, it is the freemium model that leads the pack. This model is based on the combination of two offers – the first, free, offers users access to data with limited services. But as soon as the user wants to access the broader service offering, they have to subscribe to the paid offer. Moving from one level to another happens according to different functional criteria, such as the volume of data consumption, cloud storage or associated services which depend on the interface (for example API, customization or data science services).

In the freemium model, data is free whilst the service is paid. Why? Because the true cost of open data is found in the technical architecture that supports the

***The boundary between  
data producers and users thus becomes  
porous and blurred***

positioning of intermediaries and facilitates the flow of data, their circulation, transformation and storage for constant reuse. The freemium model is therefore perfectly adapted to the free culture of open data, but also to the technical architecture that makes scalability possible.

Let's now try and define a more detailed typology of the different intermediary platforms that belong to this great big freemium family. Three categories can in fact be observed.

### **1. MapBox: freemium with diverse functionalities**

MapBox is a map service provider built on open data from OpenStreetMap. The advantage of this service is that in addition to the raw OpenStreetMap data, it has an added layer of map design and tools (software development kit, map customization, API, cloud hosting, etc.) which allows development, hosting and a guarantee of scalability for maps published as web or mobile versions.

In addition to the free offer, several paid offers are available depending on the number of views on the maps (determined by API queries) and the storage volume in the MapBox data centers. In this model, the user pays for the consumption of the technical architecture.

### **2. OpenCorporates: freemium based on the purpose of use**

OpenCorporates is a British start up, incubated at the Open Data Institute, centralizing the public information of over 77 million companies worldwide. This service offers an API which enables navigation of these data (address, accounting information, etc.) and to perform analyses by sector.

In order to avoid the privatization of open data after they are processed, OpenCorporates uses a model based on purpose rather than consumption. This means that access to data is free for projects that respect the share-alike principle by enriching the open data of OpenCorporates and keeping them open. On the other hand, if the project involves a plan to close data in the context of a commercial license, once their use, cross-referencing and enrichment is over, the service becomes paid.



OpenCorporate includes the double license principle that is treasured by open source. As Jeni Tennison, Chief Technical Officer of the Open Data Institute highlighted, this model can be adapted according to the turnover or market share of the reuser.

### **3. Enigma.io: freemium as a Trojan horse**

Enigma.io is an open data research and consumption platform. Enigma.io obtains data from American federal agencies and companies. The platform currently distributes more public data than the American government itself, whether it is for visa approvals, previous fire records or even cargo present in the Port of New York. Enigma.io thus offers access to structured data sets underpinned by other associated services (facilitated and targeted search, access by API, etc.).

Enigma.io goes even further by using the freemium as a window into its data science know-how in order to offer ad hoc services that are not directly related to the platform. In this case, the freemium is in reality acting as a Trojan horse. It is a powerful demonstration of the skills of a team that sells its data analysis skills by targeting specific market segments. This is the case in the insurance sector where Enigma.io offers to create a model and anticipate risks based on previous fire records data compiled on the platform.

If other models could have been introduced, the prevalence of the freemium model and its ingenious ability to reconcile free data and the sale of a service make it an excellent indicator of the real “value” of open data, that which is found in the flow rather than in the stock.

As early as 2009, the author of *Free: The Future of a Radical Price*, Chris Anderson, showed that the presence of something free did not mean that there was an

***The abundance of data  
and immaterial goods in general creates  
a new scarcity in its wake***



absence of business models, quite the opposite. Even more so given that the abundance of data and immaterial goods in general creates a new scarcity in its wake, which is found not in the possession of the good but in the know-how acquired in its exploitation.

The organization of the flow, the harmonization of data sets and the creation of associated services such as data sciences, present themselves as viable business models. It is also perhaps an opportunity for data producers looking for business models to think up new offers, taking inspiration from the intermediaries formed from a “gap” in the chain between producers and reusers.

— *Translation by Nicola Savage*



# OPEN DATA: SHOW ME THE MONEY!

BY LOUIS-DAVID BENYAYER & SIMON CHIGNARD

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Four years after the first moves toward opening public data in France, the economic question remains the same - why do we always have so much difficulty determining the economic impact of open data other than in a McKinsey-like style, in billions of dollars? Where is the start-up that will revolutionize the world and that owes everything to open data?

The debate on value is not new, and open data value measurements are formed using one of two ways of thinking. Either it is the value of the market for public information that is measured (for example in the context of the 2006 MEPSIR study), while a number of them were not open; or on the other hand, it is the opportunity gains that are accounted for (McKinsey Global Institute).

According to this second way of thinking, many reports were prepared and they all reach conclusions of huge amounts. The most recent, prepared by McKinsey in 2013, places the annual value of open data between 3,220 and 5,290 billions of dollars. To put this into perspective, the GDP of Germany, 4th country in the world, sits at 3,747 billion in 2014.

At the same time, many governments put in place policies to open public data for political (more open governance) and economic (to enable development of new activities that will generate economic benefits for the country or society) reasons or to drive modernization of public action.

However, it has to be said that there are currently few available convincing examples of economic value generated by open public data. Where is the start-up

that owes everything to open data? Similarly, companies don't fully commit to the opening of data that they possess, generate or manipulate, with the exception of a few players in the transport and mobility sector.

Furthermore, we sometimes have trouble understanding whether opening creates value for data... or whether it destroys it (by free processes etc.)

What reasons explain the difficulty in measuring the economic impact and value of open data?

### **Three hypothesis**

#### **Hypothesis 1: because it's too early**

The delayed effect is a first hypothesis that we can put forward to explain our difficulty in measuring economic impact. This is an approach that was developed in particular in the 2012 study undertaken by Marc de Vries and Geoff Sawyer for the European Space Agency. The authors distinguish 3 phases in the data opening effect - a sowing phase, a growing phase and a harvesting phase. If we use this approach, it is therefore logical that we do not yet see the economic benefits because we haven't yet entered the harvest phase.

#### **Hypothesis 2: because it's too unclear and/or too complicated**

In assessing the value of open data, there is a key element which is often not highlighted by authors and commentators, and which partly explains the difficulty in seeing the fulfilment of promises made. This is the fact that in many

***We sometimes have trouble understanding  
whether opening creates value  
for data...or whether it destroys it***



*Oil disappears with use, whereas data can be used indefinitely. Unlike gold, data does not have a hoarding value.*

assessments, (and in many cases of open data use), the value of the open data is realized in a large part in combination with other data, which are not necessarily open, what we generally call big data.

According to this hypothesis, in order for the value of open data to be revealed, the availability and use of other data is a determining factor. It is not only the availability that produces the whole value.

### **Hypothesis 3: because the re-users are unknown**

This final hypothesis is that reuses of open public data are not always visible, communicated or explicit.

Some reuses are particularly visible when they are embodied in mobile applications which employ them. On the other hand, the majority of open public data reuses are not communicated outside the organization that uses them. Thus it is difficult to measure that which we are unable to see.

Efforts are being made however, to better identify and record these uses, for example, the site Open Data 500, which lists them; and the open public data platform [data.gouv.fr](http://data.gouv.fr), which enables users to put reuses that they have undertaken with available data online.

### **Datanomics forward thinking: what does opening do to the value of data?**

To try and look more clearly at the question of the value of open data, let's take a detour via the value of data. Within the Datanomics framework, we

identified three different types of data value - data as a raw material, data as leverage and data as a strategic asset.

Let's concentrate on data as a raw material. The common metaphors used to describe data value (oil, diamond, wheat or gold) surface very quickly in this concept. We see data as a fuel that feeds a machine (oil), as a material that gains value once it is processed (diamond) or as a product that can be consumed or used to replenish (wheat). There are many limits to these comparisons. Oil disappears with use, whereas data can be used indefinitely. Unlike gold, data does not have a hoarding value.

One observation must be made. With open data (which by definition, do not monetize transfer), the monetary value, that which is associated with the data as a raw material, is in large part close to zero. This is also one of the conclusions of the Trojette report on public data usage fees, published in 2013.

Another reason which explains the close to zero value of data with opening can be found in the revolution of proxies. As there are many sources available to measure the same phenomenon and that a large majority of them are accessible for free, the scarcity and exclusivity of the data are much less guaranteed, their monetary value tends to decrease.

This explanation is supported by another observation relating to open data players and their business model. When open data initiatives started, economic players appeared with an "infomediary" positioning or an open data market position (Infochimps and Data Publica, for example). Today, these players have abandoned this purely intermediary positioning (data broker) to move toward a service type positioning. It is not the data that are sold, but the services that enable them to be exploited (visualization analysis for example).

Data as leverage value type corresponds the most to the value of open data. It enables organizations which use open data to improve their performance, either by avoiding costs or by growing income through better rates or new sales.



## To sell or exploit?

The nature of open data value is that of data in general: value is found in reuse, it is in the future and co-constructed. In reuse, as it is not directly monetized. In the future, as the value is only revealed once the use has occurred (it is in theory difficult to assess). Co-constructed, as it is rare that the person in possession of the data can reveal the full value.

*In fine*, opening of data presents a great number of challenges to private players. Should we accept that the monetary value of the data is close to zero, that is, do we refuse to sell them in order to better exploit the strategic value and leverage effect? As a manager of a large group who is heavily involved in open data approaches told us, “As long as no-one is making money with our data, it's not a problem for us to open it”.

— *Translation by Nicola Savage*

# “THE SOFTWARE PACKAGE MODEL DID NOT KEEP ITS PROMISES”

INTERVIEW WITH **FRÉDÉRIC CHARLES** (LYONNAISE DES EAUX / SUEZ)

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*Frédéric Charles is in charge of the information system strategy and governance within the I.T. department of the Lyonnaise des Eaux/Suez Environnement, he blogs about information systems strategies and their contributions to corporate strategies, and is regularly consulted as an expert for the 01 Business show on BFM Business. In his opinion, open the data in big corporations is firstly an efficiency issue. Even if it will not happen unconditionally.*

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## **Why open one's data?**

We can say that the proprietary software package model did not keep its promises over the long term, so SaaS (Software as a service) and open source models seem to be alternatives in response to this failure.

## **What promises were not kept?**

The first promise not kept is with regard to updates and maintenance, which are difficult and expensive. The second promise is of a strategic nature in that the survival model of a software package is to gradually broaden toward other functional domains than the one which triggered the initial choice. It creates



functional repetitions. A same function is paid for three times: twice at the time of the software purchase and a third time to develop the interface.

The initial promises to reduce cost have been oversold. In fact, we have known this for a long time (and that is why I started my blog). A large part of the publisher revenues are gobbled up in marketing and communication expenses (exhibitions, conventions, seminars, events...). In the end, these expenses have been paid by the customers.

### **What is changing with the open source model?**

In open source models, these expenses are reduced, even to nothing, which makes the direct costs of these solutions more attractive. We are not paying for the publisher's marketing but for instance for the support service or for the service we really get.

The open source model started to enter the market on the "lower" I.T. levels (LAMP, Linux, Apache, MySQL, PHP) and we now see it more and more often on industry applications. There are now applications solutions addressing standard needs, such as OpenERP, ERP5, Sugar CRM. These solutions are as good as the products on the market because they have been able to get, with their model and with time, a sufficient tester and user base to cover all the expected standard functional needs.

To address these standard needs, our preference is to buy the SaaS function because we no longer have complex updates to process. Mainly because their needs are not standard yet, the Lyonnaise des Eaux does not have an open source business software solution.

On the other hand when it comes to addressing a generic requirement, we develop on open source bases, which is the case for internet developments (with Liferay or the Symfony2 framework that replaced Dupal), research (Polyspot which relies on Lucene and SolR) or data processing (Pentaho).



## **The open source solution would not be only chosen in principle then?**

Regarding open source software, we went beyond the religious choices! Open source software provides us with excellent management of changes in the Web, where obsolescence happens so quickly. They are also a great base to set up a SaaS because we gain in flexibility and in scalability. We often refer to the fact that sometimes open source software is free to justify the choice. For us, when it comes to setting up a global intranet, we would rather pay a fair price and be guaranteed the latest patches and a quality support service with a certified partner for the open source solution.

## **To what extent do you contribute to these solutions in return?**

We already had the opportunity to share developments amongst several companies, or to sell them. But it quickly becomes complicated as we have to draw up a contract, describe the limits or liability, etc.

For an operator like us, not being a software or computer player, it is rather hard to address an open source community as a contributor, because it involves responsibilities and time.

If one day we engage in community management, we must find a benefit in this activity. Then we will do it on topics related to our operations and to our industry. The community would be our customers or our partners.

## **Beyond software, open source has a wide scope and today we talk about open data, open manufacturing... To what extent is this thinking on opening discussed or taken up in a group such as yours?**

We are service providers for local authorities. To carry out our operations, we design and build products. We could open the design of these products. It is not the case today but that could be a possibility. Ultimately we do not sell the tool that we use to offer the service, we sell the performance of the service.



## *Pressure from citizens to open data is a strong trend*

The subject of data has always been topical for us. When we handle the water management for a local authority, we collect a lot of data measuring our service quality and the water quality. This collection is carried out as part of an appointed public service contract and to comply with regulatory requirements.

On the other hand, these data are measured and calculated, and we then transfer them to authorities. It is only the latter that can decide to open the data, and it's something they won't do easily.

### **Under these circumstances, what are the open data opportunities for the Lyonnaise des Eaux?**

Over the past few years, local authorities have put in place many open data initiatives and significant progress has been achieved, in particular for the licenses and the formats. These initiatives are rarely thought as platforms or APIs, which means that technically we will probably have to start all over again. However, we will have learned from it.

Moreover, the current open data initiatives often try to do two things at once, both producing data and presenting data. It would not surprise me if the process was split in two. When Lapeyre and Castorama provide materials and tools, they do not wonder how their customers “hack” their products to find uses they never imagined.

Focusing on building reusable blocks is maybe a lesson that companies should learn. We observe that open data initiatives (hackathons, apps contests, etc.) only happen in a dozen or so big cities. Why not also do something for the 33,000 small local authorities of fewer than 100,000 inhabitants which do not have the

resources to organize such initiative and which have simple needs? In order to do so, we must find a way to achieve economies of scale and mass customization.

In general, pressure from citizens to open data is a strong trend. RATP (Paris public transport organisation) had to deal with it when it claimed its proprietary rights on the subway plans. We can clearly see that hiding behind a contract is not a lasting solution.

Besides, the State sometimes turns to the private sector to collect public data. This is what the FNAIM case illustrated. In this case, the industrial players legitimately asked for the checkbooks to be opened.

Some business models are currently established. For example, Météo France sells us precise weather data and we buy it because we need it to monitor our activities. We also buy geographical data from the IGN, a public service.

### **And you, at the Lyonnaise?**

We have the data and more importantly the expertise to interpret it. In some cases, particularly for regulatory data, everybody is developing the same thing. Surprisingly, local authorities and State agencies, that could easily get shared national platforms and pool their data, are in the end even more divided than the private sector. Why not pool these software solutions in the industrial area? If each one comes with its own software package, we then will again end up in the deficient proprietary software package model.

This still needs to be looked into further but the idea of making regulatory data available and jointly developing an open source “reader” with other public or private stakeholders is an option that may emerge with time. The I.T. department will then have to be able to adopt a different stance and work jointly with other stakeholder I.T. departments.

— *Interview by Karine-Durand Garçon*

— *Translation by Julie Robles with the help of Nicola Savage*



# “HOW OPENSTREETMAP DEMILITARIZED THE MAP”

INTERVIEW WITH **CHRISTIAN QUEST** (OPEN STREET MAP)

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*OpenStreetMap (OSM) is a tool for collaborative data mapping that enables everyone to improve a map without necessarily being an expert. Its French chapter president, Christian Quest, retraces OSM's genesis, and insists on the benefits of opening up data.*

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## What is the OpenStreetMap revolution — if there is such a thing?

The basis of the OSM revolution is to give people the power to contribute to a map. Individuals who once were merely consumers are now able to become co-producers.

Before maps reached people, it was mainly a weapon for war and a tool for exercising power. The ancestor of IGN (Institut Géographique National; — the French public cartography institute) was the “Service Géographique de l’Armée” (the geographical service of the French armed forces), whose main aim was to facilitate the movement of troops in combat.

Eventually, OpenStreetMap led to large-scale demilitarization, democratization and re-appropriation of the map.

## **Much has been said about your action around the Ebola virus issue in Guinea. What are OpenStreetMap's key projects?**

There was a founding event for the “humanitarian” use of OpenStreetMap: the Haiti earthquake in 2010. From that date, OSM has been widely used for addressing these types of crises. From time to time, this use of OSM is being highlighted in the media as they “cover” the crises. But in fact the humanitarian use of OSM is constant, from flooding in Sudan to the recent earthquakes in Turkey.

However, one shouldn't limit this use to causes in far-away lands given that humanitarian action also takes place a few blocks away from our homes. We have remarkable case studies in France, among which the partnership with “SNCF Transilien” (the national railway company that services the Île-de-France region around Paris). This partnership allowed mapping of the accessibility of train stations for people with reduced mobility. Following an experimental phase, SNCF has industrialized the process, and contracted with students to map over 300 train stations in Île-de-France.

In and of itself this is not necessarily spectacular humanitarian action, but it nevertheless proved very useful. Using the map to make it easier for people with disabilities to reach the station is also working for the community.

## **How many contributors to OpenStreetMap are there in France?**

There are between 2,000 and 3,000 active contributors monthly, a good average compared with other countries. Consider the US, for example, where the very

***“Using the map to make it easier  
for people with disabilities to reach the station  
is also working for the community.”***



large number and the detailed nature of data records which have been published as open data have been slowing down the development of a very active community. While contributors in France tend to create data, for instance by including a new street or a new building, contributions in the US are more about correcting public data, which may seem less exciting or rewarding.

### **So the relatively late opening of geographical data by French institutions was pretty much to the advantage of OSM France, then?**

Ironically, it was! This delay allowed for community of people to be united, people who, for reasons of their own, needed specific geographical data. Since the offer was non-existent or incomplete, they started collecting their own data, and OSM became their tool.

### **To which extent is this contributory model viable?**

What's interesting about the OSM model is that all of us can contribute. When you show people a map of their area, they always have something to say. It may be that the flower shop went out of business a few weeks ago, or that the baker's opening hours don't match what the map shows.

You don't need to be an expert in order to know the environment in which you live, all the more contributing to OSM is pretty accessible to non-technical people. This ensures a constant renewal of our contributors, whatever happens. Incidentally, this is the basic difference between us and Wikipedia. At present,

***“Nobody will request you to hold a master's degree in geography in order to add a neighboring retail shop to an existing map!”***

to be able to edit an article on a certain topic, you need to prove that you are an expert in that field. Whereas nobody will request you to hold a master's degree in geography in order to add a neighboring retail shop to an existing map!

However, the more densely mapped an area is, the more the contributions tend to decrease. In areas where geographical data constantly needs to be updated, this is a problem. In the Île-de-France region, which is a well-chartered territory, one gets a misleading impression of completion, whereas many things still remain to be mapped or clarified. Every day, retail shops appear or disappear, new residential areas are built... We have data on the location of restaurants, but not on their accessibility, etc.

Another obstacle to contribution is the absence of culture about geographical data. You can see this even among developers, who know how to handle data, but in general are newbies with regard to geographical data. This is like switching from plumbing to electricity: you need to renew your toolbox.

## **How are your activities sustained?**

OSM is not aimed at developing any particular business model. We simply shape data in a voluntary and collaborative way. Services that are created from data records we publish belong to a field outside our work, which we leave open to other initiatives.

The OSM Foundation is financed by non-recurrent public and private funding, and manages the whole infrastructure. Administrative management as well as the management of servers is left to volunteers. Our worldwide annual budget is 100,000 to 200,000 Euros, which seems very little compared with other actors in the field such as Wikipedia or Mozilla.

At the individual level however, each contributor is free to carry out a professional or economic activity that is related to OSM. It is important to clearly distinguish the activity of the OSM community, taken as a whole, from the possible additional and individual initiatives of its members.



**During the State of the Map, your yearly conference, we were able to notice growing interest for OSM from public or private organizations. What are your thoughts on this?**

A project such as OSM isn't only meant to collect mapping data, but also to promote its use. We generally welcome this interest.

The major point which has to be examined is the spirit underlying the interest. Does it correspond to a rationale of predation, in a spirit of monopoly, or does it on the contrary take place in a spirit of sharing? We remind companies which fall in the first category and consume our data without complying with its license, for instance, that OSM is not merely a free data bank. A few rules need be observed in this game, among which are the attribution rule and the sharing rationale.

In most cases, we are able to come to an agreement which is advantageous for all stakeholders. The fact that some businesses are linked to our movement is also very rewarding to us as this amounts to validating the quality of our contributors' work.

**What relations does OpenStreetMap have with actors such as Mapbox or Telenav?**

These actors add value to the result of our contributors' work. They also act as facilitators, since they enable organizations to include OSM building blocks in large projects.

As I said, this is not part of our core mission. We do not claim this know-how. Everyone masters their own field of expertise, and is aware that ownership of data or code is not challenged at all.

However, Mapbox has investment capabilities which provide leverage for market dominance. We simply make sure that it does not set up monopolies that OSM would become dependent upon.



***“Government has understood that open data also improves internal efficiency, that it is a tool for collaborative governance that through sharing enables de-compartmentalization of institutions.”***

**The Paris Conference in 2014 was indicative of a new state of affairs. Open data has reached a turning point...**

Indeed. Only a short time ago, one tended to have an idealistic view of open data. We used to hear everywhere that open data was the new oil field, that it would trigger economic growth via the miraculous creation of start-ups, and that everybody had to join in. This “trendy” side of our movement had a deceptive aspect, because one could easily think that open data was not delivering on its promises.

Today, the communication effect has faded away, allowing us to address more important issues. The French government has understood that open data also improves internal efficiency, that it is a tool for collaborative governance that through sharing enables de-compartmentalization of institutions. And there are rising concerns about transparency and open government. Surely we have a long way to go yet, especially with regard to the opening of financial data and data about lobbies, but it is reassuring to note that this process is underway, and that the public actors are going in the right direction.

— *Interview by Chloé Bonnet*

— *Translation by Thérèse with the help of Antoine Martin-Regniault*



# “SIMPLE SOLUTIONS THAT BENEFIT EVERYONE”

INTERVIEW WITH **GUILLAUME CROUIGNEAU**  
(CEO OF CANAL TP, NOW KISIODIGITAL)

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*Canal TP is the digital subsidiary of Keolis group, the French market leader for realtime passenger information on commuting. Canal TP is a major player utilizing open data, prompting local authorities and public transport bodies to release their data to enhance the public transport experience.*

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**How did you adapt from running an IT company dedicated to public transport to an open data culture?**

We were already opening our data before the concept or the expression existed. Free and widely accessible public transport data is an integral part of our mission. The more digital information services you broadcast through web sites or mobile apps, the more physical users you acquire using the transport infrastructure. This seems obvious now, but it wasn't always the case over the last few years. We had to convince customers and partners to move in this direction.

**Today you are more like an open data broker between producers and users. How did this influence the business model?**

Our goal is to aid developers in data mobility to further optimize their services, by increasing the digital presence. In transport, the data structure is rather complex and multidimensional, combining space and time; it looks

completely different from the simple data gathered from the personal expenses of a Minister. Having worked with these software developers on open innovation projects, we realized that understanding and manipulating these data is not second nature for them and many of them were spending unnecessary amounts of time on this. We decided to create concrete solutions to make their lives easier.

## How?

The first idea was to put all the information in the same place, to provide a ready-to-use service, which we developed as Navitia.io. At the time of development, we had no fixed model in mind. Naïve as this was, we were convinced that if this platform could help a lot of people, we would be able to find a profitable business model.

If I had to now label the business model based on this platform, I would call it freemium. The free component is fundamental with open data and we fight to keep it this way. But we understand that once you start discussing big projects which require specific services and modifications, there are higher costs involved, and a paid model is a legitimate solution. This happens in two cases. Either when we have to commit to a certain level of services provided or when we are dealing with big user numbers which push up costs.

We do everything we can to make the model transparent and avoid having to charge a fee. Besides Navitia.io, which offers open, aggregated, and ready to

***“The more digital information services  
you broadcast through web sites or mobile  
apps, the more physical users you  
acquire using the transport infrastructure”***



use data, we also make open source technologies available to developers for use on their own servers. These ready to use and hosted functionalities are offered together with our commitment to continue to provide related services.

### **What are the obstacles in using open data for transport information, particularly for Navitia.io?**

The real problem is not only technical, but legal. As soon as you start combining geographical areas and means of transport with open data, you open up a Pandora's box of licenses, incompatibility, reciprocity, share-alike etc.... We are working on this question of legality, and we are perfectly aware that this needs a great deal of explanation among data producers so that simple solutions can be found to benefit everybody.

The other difficulty is making the data handling automatic. By definition, the data is constantly moving in the world of transport, making it inconceivable to manually process the data. Of course we implement manual checks, which we will continue to keep doing, but automatization is necessary, while at the same time very complex, given the need to continuously enhance public transport open data

Finally, I think there is a third and last obstacle we have to deal with, namely homogenization. There is obviously a multitude of data producers who have many different modes and strategies, which have a direct impact on the data. These differences are noticeable when the naming of stop points can differ from one producer to another. Producing homogeneous services from heterogeneous data structures is far from simple.

### **You opened the doors to your source code last April. How is this open source project affecting your API project?**

It is all a continuum. Open source and API are two interconnected projects that aim at facilitating open innovation and making this innovation available

to optimize public transport. We are convinced that the way people are now mobile in time and space is undergoing a radical change together with their relationship with transport.

The first aspect of this change is personalization. Travelers no longer want to adapt themselves to networks and different modes of transport, they want the transport infrastructure to adapt to their needs and journeys. The second aspect is that the type of transport vehicle used is no longer a main issue: taking the train or the car matters less and less. What the traveler really wants is to use the most fluid and efficient means of transport possible to get from A to B. The increase in car-sharing is a good example which illustrates this trend.

This revolution in terms of usage and personalization is responsive modes of transport: how to use the data and services to create the maximum amount of flexibility and agility throughout the different networks and means of transport so as to satisfy everyone's needs, in real time, by combining every way possible.

Navitio.io is obviously an indispensable tool for inventing responsive modes of transport services. But only building an open API is not enough. For us, open source is obvious, and we will continue using open source logic for all our products. It is fascinating to see the power of this community, its energy, and the effects of open data on agility and innovation.

— *Interview by Chloé Bonnet*

— *Translation by Guillaume Crouigneau with the help of Caitlyn Hutchison*



# **“Earn less economic value to create more social value”**

**MICHEL BAUWENS**

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*Michel Bauwens is a peer-to-peer theorist, author and speaker on technological and cultural innovation. For him, we have already started to see evidence of a space which exists for open business models.*

- *What are the most striking examples of free initiatives?*

- There are two sectors for which we have significant hindsight: software and open manufacturing with Arduino. In the case of open software, Linux and Ubuntu are good examples which clearly outline the questions of the contribution economy. Three quarters of individuals working on the core of Linux are full-time employees elsewhere. In these systems, commons is built by volunteers, very few employees, and the contribution of some companies. We can see that only few voluntary contributors live exclusively off their involvement. We find the same situation again in the Arduino ecosystem, albeit with one difference about the commons. Indeed, in open software, there are commons institutions, non-profit organizations protecting infrastructures, viability and production and diffusion (Linux, Wikimedia or Bitcoin foundations, by example). In open hardware, dependency on companies is more important. This is probably due to the material dimension of the product, which greatly increases production costs. There, commons institutions are less numerous, or at times even absent.

- *In these examples, how are contributors remunerated?*

- This is the precisely the problem. They do not find remuneration directly via their involvement in the production of commons. Individuals have to join the market economy to be able to provide for themselves. We need intermediate structures between foundations and companies. For now, those intermediate structures do not yet exist. We could imagine cooperative organizations linked to structures in charge of the construction of commons. It is today my priority to find and precisely describe which type of entities these could be. The fundamental problem is the tension between the need for scarcity in the market economy and the abundance created by digital technology. Companies base part of their economy on scarcity, which is inconsistent with the commons logic. Some initiatives try to go beyond this opposition, like GCoop in Argentina and OS Alliance in Austria. Wikispeed (*open source car, ed.*) is another interesting example: they refuse venture capital funding to keep control of their work and their independence. Extreme-manufacturing methods developed (and which are close to agile methods from software) are also particularly interesting. Always in open manufacturing, Open Tech Forever is a cooperative developing open agricultural machines. Finally, Protei, with the open project H2O, is the example of a project with a very strong scientific dimension, with an open license, while looking for a sustainable business model. When we design a product for the market,

***“Companies base part of their economy on scarcity, which is inconsistent with the commons logic.”***

the logic is scarcity, just like planned obsolescence. Instead, if a community designs a product, we naturally head towards a more sustainable path.

- *If the market is not suitable for the construction of the commons and if individuals cannot provide for themselves when being involved in it, what is the solution?*

- We can say that technologies we consider crucial for the future, for example those linked to new energies, must not be privatized. They must be a commons (possibly protected by Government). Recent events have shown us that, in the specific case of energy, energy and car-manufacturing companies and associated lobbies implemented strategies to delay the arrival of new disruptive technologies as much as possible and this, ironically, thanks to patents (see *Who killed the electric car?*, Chris Paine, 2006). Instead of promoting the spreading of these innovations, patents indirectly contribute to limit their spread when private capital bought patent portfolios and companies which owned them in order to prevent the spread of these technologies. In health care, the two examples of polio and AIDS, give us a similar demonstration in that when technologies are protected, they spread much slower than when available and open.

- *Which business models work?*

- As we don't monetize the commons, whether it be software or product design, we monetize the peripheral services. The peripheral services path is the most successful thus far. But it raises one concern, namely investment funding. Indeed, our economy is based on debt. Yet, the production of a commons does not generate ongoing remuneration, therefore it does not interest the majority of investors. Initiatives by commons investors are emerging like the Open Venture Movement (Hub Launchpad, London) or



Ability Capital (Melbourne, Australia) which fund open projects. These investors accept to earn slightly less economic value to create substantially more social value. They have a wide, long term vision of capital, not only economic, but also social and cultural. In Ecuador, the government declared itself ready for a transition toward an open knowledge society based on commons. Making investments in open projects is a way to engage this transition. It is also in this context that I am presently in this country where I work as Head of Research.

- *What needs to be leveraged in order to foster these open models?*

- First, we have to foster commons production practices. Open access and open science are examples going in this direction. We also need a strong legislative framework supporting open production. There are also important material conditions, as for example universal access to broadband and creation of small plant networks linked to open design communities. Intangible conditions are also required. We need an open system of knowledge qualification (especially for PhDs) and systems of validation and legitimization of produced knowledge. Finally, new management methods like open value accounting would enable us to identify, value and reward contributions. This question of valuing individual contribution is not simple. We know now that if we establish too direct a link between contribution and compensation, we impact the behavior of contributors, who will start to produce with a market logic instead of a commons logic. Sensorica is working on a financial remuneration system for contribution which dissociates earnings and contribution: each contribution is assessed by peers, which determines an individual rating. Then, money is possibly collected and distributed according to this rating. In this system, contributions are not technically goods. More fundamentally, we need to redefine the way we create and share value.

- *How do we achieve this?*

- We know we are able to exponentially increase the use value, and we know that at the same time economic value only grows in a linear manner. This is a problem. Facebook perfectly illustrates this phenomenon. The issue is one of capturing the economic value. The platform captures all the value. Nothing goes back to individuals who build this value. We reach a paradox in that peer-to-peer systems demonstrate a far more important productivity than merchant or hierarchical ones, and this productivity gain is captured by a

comparatively small number of actors who have placed themselves in a central position. In models we try to promote, those who contribute to the commons should be those who capture more of the value at the end. We want to create a business model which restores the link between value creation and value capture.

— *Interview by Karine Durand-Garçon.*

— *Translation by Anne-Sophie Payen with the help of Antoine Martin-Regniault*



# OPEN COMPANY: TRANSPARENCY ECONOMY

*Within the Open Company Initiative (OCI), a certain number of companies encourage more transparency and trust by sharing information and know-how in a collaborative environment.*

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It is a club promoting transparency. A club any company can join, provided it is willing to play by the rules of the open economy. A group of gift economy and free software pioneers.

## **How does it work?**

The OCI supports the Gittip platform – which is mostly a tool for independent developers – to take this community to the next level. The OCI, is itself funded through Gittip, and gathers a group of innovative companies who agree to share what's happening behind the scenes, by pooling their ideas and code, by discussing their successes and failures.

To transition from the individual stage to the organizational stage, the \$100 weekly limit for donations was removed. Far from being a strict certification organism, the OCI leaves it up to its members' responsibility to set their own rules of acceptance.

Along with constant online exchanges throughout the year (the OCI is a very busy group), members meet physically once a year for a big congress (in 2014 in San Francisco). The base-camp is the Saxifage School, a higher education laboratory settled in Pittsburgh – the hometown of Chad Whitacre, founder of Gittip. As you can imagine, all the members make an extensive use of GitHub to discuss, share and finance one another. Subscription fees are on a pay what you want basis.

## A matter of trust

Looking at the internal workings of OCI, we understand that trust is the central engine of the group. Members are connected cells working together to improve products and services offered to the community. The core idea is “take it further than the law”, as mentioned on their website. How? Maximizing transparency and openness as the rule of thumb.

The OCI was born alongside the Gittip and Balanced Payments companies. Each one had its own vision of the sharing economy. For Gittip, open is built on three rules: share as much as possible, pay as little as possible and do not compensate employees. For Balanced Payments what matters is great customer care (thanks to a dedicated IRC channel), public discussions and a process to use external ideas in product updates. Over time, these pioneers were joined by the Saxifage School, Sentry, The Open Company, Lincoln Loop and Bevry.

Chad Whitacre has another idea in mind: Open journalism in the very heart of the OCI galaxy. Paid following the donation scheme, “internal” yet impartial and transparent reporters would investigate on the practices and outcomes of the members in order to share this information with the rest of the group. “Receive honest feedback is the only way to improve oneself”, reckons Chad Whitacre, defender of transparency at all costs.

— *Translation by Sébastien Nicolaïdis with the help  
of Antoine Martin-Regniault*



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*presented by*  
**LIONEL MAUREL**



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**ART & CULTURE**

## LIONEL MAUREL

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*Lionel Maurel is a jurist and library curator. Since 2009 he has been writing a blog called “S.I.Lex: at the crossroads of copyright and information science” under the pseudonym Calimaq. He is interested in legal changes in the digital environment, in particular in copyright and intellectual property. He attempts to redefine the principles of intellectual property in a way that encourages new uses. He is the co-founder of the SavoirsCom1 collective on Common Knowledge Goods, and is also a member of the Strategic Orientation Board for the association for the defense of digital freedoms, La Quadrature du Net.*

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# 7 OPEN BUSINESS MODELS IN ART AND CULTURE

BY **LIONEL MAUREL** (LAWYER AND LIBRARY CURATOR)

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## **Open business models in art, an impossible bet to make?**

I clearly remember a discussion I had with a movie producer who supported the fact that free licenses could only work in the field of software or online encyclopedias. Besides free software and Wikipedia, for him, cultural creations (books, movies, video games or music) exhibit too many particularities to authorize the adoption of lasting business models capable of assuring broadcast of the creation to the public while allowing its creators to be remunerated. It is undoubtedly due to this discussion that I wanted to write this text.

## **7 business models mapped**

Let's start with a detailed mapping the different business models identifiable in multiple fields of creation: films/video, music, books, photography, video games, television, media. Under the term "Open", I focused on projects which use free licenses and free circulation licenses and especially Creative Commons licenses that are the most widespread. This landscape is the result of the monitoring I undertook on open licenses over several years. In light of this mapping process, we notice that many open experiments in cultural creation exist, using a wide range of business models, way more than open source software and encyclopedias. Each field of creation (music, cinema, publishing, video games, etc.) has its own specificities, but we can identify a few recurring models:



- › **Crowdfunding**, which enables creators to get public funding for their to-be-launched projects in return for the commitment to open up their works under open licenses. This is done via platforms like Kickstarter in the United States, Ulule or KissKissBankBank in France.
- › **Crowdsourcing**, which permits open and public contributions in terms of content, generally gathered on a platform or a website like Flickr for photography.
- › **Disintermediation models** that enable creators to be in direct relation with their audience, without classical creation intermediaries (editors, producers, broadcasters, etc.). For example, Bandcamp for music.
- › Double dissemination models in which the digital version of an artwork is free under open licenses, whereas its physical format continues on being commercialized. For example, novels by the writer Cory Doctorow.
- › Different forms of “Freemium” in which the “raw” work is shared freely via open license, while its expanded version or its associated services are sold. For example, the hybrid business model of the movie *The Cosmonaut* (Nicolás Alcalá, 2013).
- › Models restricting the commercial usage of creations. These models cannot really be called “open” because the circulation of creations is allowed by their licenses whereas their commercial use is not. Even though individuals are authorized to share the creation, its monetization by economic actors makes a business model possible. For example, the photographer Trey Ratcliff.
- › Different donation-based models. Either the public directly gives the donation to the artists or it is given to a foundation or an association that organizes content creation. For example, the HumbleBundle platform for video games.



# WHAT OPEN MODELS FOR ART & CULTURE?



- Mainstream artists experiments
  - Nine Inch Nail, R.E.M, Paul Simon, Peter Gabriel, Moby, Gilberto Gil
- Crowdfunding
  - Amanda Palmer, Uniform Motion, Dan Bull
- Music sharing platforms
  - Dogmazic, Jamendo, Soundcloud, Revolution Sound Record
- “micro-patronage”
- Direct contact with audience
  - Wiseband, Bandcamp
- uniform motion: numerous experiments
  - Crowdfunding, couchsurfing during tours, collaborations with fans
- moby
- Limits
  - access to mainstream distribution channels
  - Competition with freemium models (in particular streaming with Deezer, Spotify,...)
  - Link with collective management



- crowdfunding —● Humble Bundle, Kickstarter: Haunts The Manse Macabre
- abandonware —● Glitch
- Limits —● Investments amounts
- Competition with free-to-play models

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- Crowdfunding —● Kickstarter: Ryan North, Robin Sloan, Ulule: Les Noénautes, Specialized platforms: Unglue.it, Leebre.org
- NC Licenses + traditional publishers —● Cory Doctorow, Dan Gillmor, James Patrick Kelly
- Associations/donations —● Framabook, Pratham books
- Self-publishing platforms + print on demand —● Lulu, In libre veritas
- Open Access academics —● Bloomsbury Academics, Knowledge Unlatched...
- Collaborative writing and publishing —● Sesamath, Lelivrescolaire.fr
- Limits —● Freemium model more difficult to implement



- Experiments
- Ridley Scott (Webseries Blade runner), Nina Paley
- Crowdfunding
- The Cosmonaut, Vincent Moon, The Tube Open Movie



- Limits
- Investments

- difficult access to movie theaters and TV
- difficult access to public funding

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- Channels: Aljazeera, BBC Air
- Audiovisual archives
- ABC Australia, Images for the future (The Netherlands), NRK (Norway)
- Évènements payants
- TED conferences
- Crowdsourcing
- Arte Creative
- Limits
- Complex rights management



- Citizen journalism —● Propublica
- Crowdsourcing —● Global voices, Nonfiction.fr
- Crowdfunding —● Mediavox, stories on Kickstarter
- Limits —● Monetization difficulties  
(common to all online press)
- Difficult access to public funding

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- 2.0 platforms —● Deviant Art, Flickr, Fotopedia...
- Crowdsourcing / Foundations —● Wikimedia Commons,  
Wiki Loves Monuments
- Professional photographers/  
NC licenses —● Trey Rattcliff, Jonathan Worth,  
Vinoth Chandar
- Crowdfunding —● Stories on Kickstarter
- Limits —● Opposition from traditional photographers



## Open beyond open

There is a formal definition of *open* given by the Open Knowledge Foundation (“Open Definition”/Definition of open Knowledge). It’s a definition where the term “Open” goes beyond the deep understanding of the word “Free” (not as in a free beer...), where only content, data, creations, and software placed under CC0, CC-BY or CC-BY-SA license (or equivalent, especially for software) are considered as open.

It is the authoritative definition of “Open” despite the fact that it is used only in specific areas like in open source software or in open data.

However, this definition of open cannot be applied to the open access (open access to scientific articles). In this case, “open” means “available online for free” and not necessarily “under open licenses”. Open access is sometimes under copyright and this is very much the rule in France. The debate about the legitimacy of this approach is raging. But let’s acknowledge that the advantage of this latter approach is to make things more nuanced.

In the domain of art and culture, I quickly realized I could not stick to the strict definition of the OKF. I considered projects as “Open” that were under licenses that are not “free” in its full meaning, those that are placed under licenses with NC or ND clauses. Purists might scream, but otherwise we miss two thirds of open models examples in the cultural sector.

There is also the open “beyond open”, in conventional sectors which use the license “Copyright: all rights reserved”. For example, the British author J.K. Rowling authorizes all “fan fictions” based on her saga Harry Potter, on the condition that they’re not erotic and have no commercial exploitation. Isn’t she, somewhere, in the open? *League of Legends*, the most played online game in recent months is derived from another game (*Defense of the ancients*), itself derived from *World of Warcraft*. It is accessible in free to play mode (we play for free and only buy bonuses) and its development largely relies on collaboration with the community. Another popular success is the game *Minecraft* that is in a way based on the same model, one that is strongly collaborative and yet not placed under free license.

The definition of open can therefore vary greatly, depending in particular on different themes (open data, open access, open design, open source, culture, etc.). In my view, this very interesting phenomenon of the spreading of open models beyond open should also be highlighted.

## Limits of open in art and culture

In addition to this identification and classification work, one aspect that also interested me is identifying limits or blockages encountered with open approaches in terms of cultural creation. Once again, it is clear that these limits vary greatly according to different creative sectors.

In the music sector, for example, it could be the difficulty to cope with collective management systems of rights that are very important for their creators. In cinema, blockages arise in the difficulty for creations under open license to receive aids supporting creation, which are nonetheless a key element in this sector, but also difficulties in getting into traditional distribution channels, especially in movie theatres. In terms of literature, difficulties reside in the absence of centralized platforms to enable authors to tackle problems related to lack of visibility (there is no Bandcamp for books yet, for example). Other sectors, like media or photography, face monetization challenges that affect these sectors on the Internet and impact both classical and open projects.

More widely, we can identify that “open” projects are starting to face the competition of actions initiated by traditional actors in cultural industries, juggling between free and paid models. However, every open business model relies on variations on freemium model which can offer free stuff to monetize on others. But today, this “hybrid tactic” sometimes exists on a very large scale, implemented by a “proprietary” culture. For example, musical streaming sites like Deezer or Spotify mainly focus on a kind of “opening” without using open licenses, but allowing a very wide range of free content.

In the field of video games, the booming of the free-to-play model was also due to “opening-up”, even without very popular games like *League of Legends* or



*The open in the cultural sector now faces a sort of competition resulting from the change in cultural industries, which gradually adapt to a digital environment and adopt its logic.*

*World of Tanks* being in open source. This shows the existence of open beyond open in the legal sense of the term: the Korean singer Psy crowdsourced Gangnam Style dance step and deliberately let the video of his song circulate on YouTube to gain popularity and monetize this circulation via advertising. There is indeed a kind of opening up despite the fact that the traditional system of “Copyright: all rights reserved” remains in place.

Consequently, the open in the cultural sector now faces a sort of competition resulting from the change in cultural industries, which gradually adapt to a digital environment and adopt its logic. No doubt that to find a second wind, open in art and culture has to build upon commitment to values by creating preferential relationships between creators and the public, thanks to opening of legal frameworks.

— *Translation by Anne-Sophie Payen with the help of George Husni*



# “CULTURAL INSTITUTIONS ARE IN NEED FOR HIGH FASHION BUSINESS MODELS”

INTERVIEW WITH **CAMILLE DOMANGE**

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*Camille Domange led the department of digital programs for the Ministry of Culture and Communication. In January 2014, he handed over a report entitled “Opening and sharing public cultural data. For a digital (r)evolution in the cultural sector”.*

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## **What is the Ministry of Culture’s commitment to digital and more specifically to open data?**

On November 7, 2013, Aurélie Filippetti (previous Minister of Culture, editor's note) announced that she wanted to put in place a strong policy in this area. The “Digital Fall”, which resulted in a series of new and innovative events in digital communities like Wikimedia France or Creative Commons France, enabled a ministerial policy for digital uses in the cultural domain to be formed. The goal was to highlight the fantastic vitality which permeates culture and to prove the power of innovation which lies with digital “hack-tors”. For a long time the digital policy was built only around access to cultural data (website, database, archives, etc.). Today in a paradigm shift we are changing rationale.



## **In other words?**

The citizens want to reclaim and create cultural, economic and social value based on this data and works in the public domain. We have to make this re-appropriation and reuse as easy as possible. The economics of the digital world are based on uses developed thanks to the creative and innovative power of people, not solely as the result of technological development. Digital technology is a revolution - or rather an evolution of our economy - which should not be thought of as the evolution of a sector or an industry, but on the contrary, it should be understood in a global manner. It turns the organizational and structural codes of all organizations upside down, especially in the cultural sector. The ministry has a support role for stakeholders of this digital transformation. When we understand that culture contributes seven times as much as the automotive industry to GDP, there are exceptional possibilities afforded by digital technology to make culture a strong sector in the future.

## **The report has been written in this context. What are its conclusions?**

This report is following Mohammed Adnène Trojette's report in November 2013 to the Prime Minister about the evaluation of license fees for public data reuse, which excluded cultural data from its scope. The new report was written following a collaborative process. We started in the summer of 2013 with a public consultation to collect citizens' opinions on open cultural data. In order to start working on this digital policy, it was important to know which data to focus our efforts on in terms of working on making them open. This study enabled us to identify three types: statistical and economic data of the cultural world, cultural metadata (for example, the Bibliothèque nationale de France records) and image files (for example, the picture of a painting which is in the public domain). This last point, legally complex, resulted in a number of additions to this report. We then sent a questionnaire to French cultural institutions, but also to foreign institutions, such as the J. Paul Getty museum of Los Angeles and the Rijksmuseum of Amsterdam, especially regarding their license fee policies for cultural data.

***“The economics of the digital world are based on uses developed thanks to the creative and innovative power of people, not solely as the result of technological development.”***

**And what did you observe?**

That only a handful of cultural establishments generate real revenues from license fees. The report fulfills an educational purpose by defining some important concepts. We observe increasing confusion when it comes to open data. In reaction to the news about big data, such as the PRISM case or the problem of privacy, there is much confusion and misunderstanding. This report also includes tangible measures enabling cultural institutions to address the crucial matter of business models. It also gives an international perspective on the opening initiatives taken in the United States, in Great Britain, in Poland and in the Netherlands. This is a recurring concern for museums, archives libraries and “GLAMs” (Galleries, Libraries, Archives and Museums). Some cultural institutions, in particular those in the United States, have already implemented very engaging opening strategies. Finally, this report aims to provide cultural institutions means for taking action and to urge cultural institutions to set up at least trial financial measures in order to track the positive externalities of a wider cultural data opening. The alternative between “all open” and “all closed” is paralyzing. The report encourages a gradual release, the development of innovation ecosystems and creations around particular license contracts.

**A significant part of this report is dedicated to business models for cultural institutions and culture in general. What are your main conclusions?**

Cultural institutions are in need for “high fashion” business models. We have to craft tailor-made digital policies that are adapted to the challenges these



institutions face and that support development strategies which take into account the drastic consequences of digital technology. With this aim in mind, institutions need to develop high-value services economy, backed by their digital data opening. This issue presents a digitalization financing challenge and issues relating to the means to be deployed to accelerate this reusable data opening. In addition to self-financing, the report reviews the different options such as crowdfunding, public-private partnerships and skills sponsorships. These are only a few examples. Other methods can and should be implemented. The example of the business model set up by Numalire.com is, in this respect, very interesting. More generally, open data is the base for more collaborative business models and contributes to building a creative and inventive sharing economy. The Bibliothèque nationale de France provides us with a great modern example, as it is the first cultural institution to carry out its action according to the framework of this report. It just released all the bibliographic data... more than 12 million data! It is a very encouraging sign which enables the Bibliothèque nationale de France to position itself as a reference institution for bibliographic metadata. What is clear is that this work on cultural sector digital data is a key issue which institutions have to address quickly in order to be able to adapt their strategies to digital challenges.

— *Interview by Louis-David Benyayer*

— *Translation by Julie Robles with the help of Caitlyn Hutchison*

# “IDEAS CANNOT BE ‘PROTECTED’... AND I HAVE NO INTENTION OF DOING SO”

INTERVIEW WITH **JULIEN SIMON** (AUTHOR AND PUBLISHER)

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*Julien Simon, founder of the publishing company Walrus, publishes digital e-books. Under the alias Neil Jomunsi, Simon launched the ‘Bradbury Project’, an initiative to publish a weekly short story over 52 weeks, all under a Creative Commons license. This is the testimony of a “free” author.*

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## **The Bradbury Project**

“It is too early for me to compare the trajectory the Bradbury project would have had under a traditional framework compared to that of the Creative Commons. As a matter of fact, this choice was mostly led by the meaning behind the project, which was an artistic and editorial reflection. I started with a very basic principle: that all I have learned came from the literature and art within libraries. My parents would drop me off twice a week, and I would gather as many books as possible, something we cannot really do with electronic books. Naturally, since I led the creation of a 100% digital publishing house four years ago, I couldn’t think of another format when I initiated the kick-off of this project. I would write a short story during the week, edit it,



and deliver it to the public at the end of the week. Each story is sold for 0.90 Euros, but distributed under a Creative Commons license. It means that you can then lend it to your sister, your mother, your neighbor. Utilizing this open license enables lending.”

## **An Experimental Business Model**

“The short stories are sold on traditional distribution platforms. At the beginning of the project, I was very well aware that I wouldn’t become a millionaire in three weeks. For 40 Euros, you can also have unlimited access to all the content as a subscription-based offer (instead of the 52 Euros you would spend if you are buying each week). It is more interesting and profitable for me, but also for the readers, as they have invested financially and committed with the intention of regularly consuming the content. When you have paid 40 Euros, the likelihood of you reading something is much higher than if you had it for free.”

## **Sharing Literature**

“With electronic distribution platforms, I can react to the feedback and adjust my plans and commercial strategy in real-time. I’m currently writing an entire novel by email and publishing a chapter each week. This week, I discovered a new way people use this project: a literary blogger offered to publish my writing on her blog, as it is published under an open license. Offering literature under an open license enables sharing.”

## **Why this type of license?**

“This is something I still think about. Given the energy and thought I put in before I make a decision on where to position a comma, or when to end a sentence, I don’t want people to take my writing and change it as they will. Having said that, if someone wants to use the topic of one of my stories, the ideas cannot

be ‘protected’... and I have no intention of doing so! My ideas are also inspired by what I have seen on TV, what I have read in a book... I am not against remixing. There are certainly things I miss about the traditional framework, but this seemed like the right license for this project.”

— *Translation by Tuan-Minh Nguyen with the help of Caitlyn Hutchison*



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*presented by*  
**BENJAMIN TINCQ**



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**MANUFACTURING**



## BENJAMIN TINCQ

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*Benjamin Tincq is a specialist in peer-to-peer models and digital transformations. He is the co-founder of OuiShare, an international collective which is both a think-tank and a do-tank dedicated to the collaborative economy where he coordinates strategies, partners and studies. His research work is directed in particular toward the economic, social and environmental promises of the new production system linked to distributed manufacturing and open source hardware. Benjamin is a trained telecommunications engineer, and worked for five years as an innovation strategy consultant before deciding to "job out" and co-found the OuiShare project.*

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# OPEN SOURCE HARDWARE BUSINESS MODELS

BY **BENJAMIN TINCQ** (OUISHARE) & **LÉO BENICHO** (ENGIE)

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## Humanity's “common pot”

Over the last thirty years, free and open source software has become the dominant industrial model in the IT sector. It is based on the free and open sharing of source code, developed by a community of contributors which is often backed by a commercial structure that creates market value above and beyond the “commons”, in particular by service provision (consulting, training, support, etc.). The undisputed success of this development model calls into question one of the foundations of industrial capitalism which considers patents and intellectual property as the key tools of business competitiveness.

At the same time, this contributory dynamic has gradually become used across the board for all types of intangible production – the “knowledge commons” or “digital commons”. Digitized information is produced by peers, from free software to contributory encyclopedia Wikipedia, OpenStreetMap's map data, or even the creative and scientific content published under the Creative Commons and open access licenses. But for a few years now, the focus of this production method has gone largely beyond the digital and software spaces to reach material products, hardware.

Like software source code, a physical object can be described by one or more digital files such as designs, diagrams, tutorials and in particular 3D files ready to be brought to life by a 3D printer, a laser cutter or a CNC (computer numerical control milling machine). Sharing files under free license, together with the widespread availability of digital manufacturing tools (especially via places such

as fab labs and makerspaces), enable physical objects to be distributed, replicated, improved and reshared. We refer to open source hardware and also open design.

The model doesn't seem to have any limits and has impacted almost all sectors: electrical components (Arduino, Sparkfun), high-tech (OpenReflex, Phone-Bloks), vehicles (Wikispeed, OSVehicle, XYZ Cargo), drones (DIY Drones, Protei, OpenROV), machine tools (RepRap and associated tools, LaserSaur, Open Source Ecology), interiors (Wikihouse, OpenDesk...), textiles (OpenWear, OpenKnit) or even connected beehives (Open Source Beehives) and aerospace (MakerPlane, Copenhagen Suborbitals)!

Open source hardware and open design promise many things, including projects contributing to "humanity's common pot", cooperative R&D, fast innovation cycles, product cost/quality ratio, replicability and adaptability, distribution of production methods, product sustainability, etc. One critical element remains however under analyzed, that of open source hardware business models, which are not yet completely stabilized.

Even though marginal manufacturing costs place a physical limit to the replication of the free software business model, their reduction via development of digital tools and manufacturing sites has enabled some of the players mentioned earlier to identify a durable business model, even in a niche market.

## **From Software to Hardware**

If open software and hardware are comparable in many ways in terms of industrial development (R&D intensity, technical complexity of objects, strategic nature of design and engineering roles, etc.), the actual production of material goods adds a layer of complexity to the open hardware business model.

**MARGINAL PRODUCTION AND DISTRIBUTION COSTS** are still far from the zero marginal cost predicted by American theorist Jeremy Rifkin. In fact, even if the cost of labor and machines (hence capital) has a decreasing structural trend, the materials remain a cost item which cannot be reduced, especially in the context



of diminishing natural resources. The economic equation of an open hardware project must therefore take this fact into account.

**A FRAGMENTED AND COMPLEX VALUE CHAIN** where industrial R&D, design, production, distribution and service functions require different skills and tools which can be split between several geographic and/or legal entities. Management of a logistics chain with multiple suppliers is also much more complex than the integration of third party developed software functionalities. Finally, once the product is assembled, it must be physically transported to the place it will be used, unless the manufacturer chose to produce it locally. An open hardware project must therefore ask itself what role it wants to assume in the value chain and the level of distribution of the production methods it want to use.

**STRICTER QUALITY PROCESSES AND STANDARDS.** It may seem difficult to be hurt by a web application, however with a physical product such as a car, the risk is very real. This is the reason why the responsibility of manufacturers of physical products is much higher than that of a digital solutions provider, which means that there are various norms, certifications, tests and quality processes which add greater complexity to the distribution of an open hardware product in comparison to a free software product.

## **Types of business models**

Having explained these three limitations, let's analyze the business models currently being used in open source hardware by looking at six "archetypes".

***What most of these models have in common is a strong relationship with their user community, who undertake part of the product R&D.***

## **The non-profit or “foundation model”**

This model is now a classic in the free software sector and is based on having a foundation that supports the promotion and development of a free technology as well as the management of an ecosystem of businesses around the technology. The most well-known examples are the Apache, Linux and Mozilla Foundations which obtain income from donations, public subsidies and private partners.

Even though this model is still in its infancy for hardware, there are some examples such as the OpenH2O Foundation which develops open hardware technologies for oceans. They are used in particular by Protei, which develops marine drones to clean the oceans (OpenH2O originating from Protei) and OpenROV, which sells kits for the construction of small robots for underwater exploration. Other examples include the open source construction system Wikihouse, which aims to become the “wikipedia of objects”, or Phonebloks, which is developing modular electronics standards, in particular for smartphones, in collaboration with industrials such as Google, ZTE and Sennheiser.

## **Monetizing open source hardware**

For most open hardware players, the sale of products remains the main revenue stream, whether they are sold in kits or pre-assembled. The margins on the sale of material fund R&D and distribution costs (online sales and/or resellers). This business model makes sense in that for many types of products, the majority of users (individuals, amateurs, etc.) don’t have the time or the desire to source the components and materials themselves in order to save on the manufacturing margin. In this case the heart of the open hardware value proposition is in the guarantee and confidence brought by being able to “open the bonnet” to better understand the operation of the initial product, and even to make modifications so as to adapt it to a need or a specific context.

What most of these models have in common is a strong relationship with their user community, who undertake part of the product R&D. This is most often done on public forums through discussions about the design selected,



functionalities and support or “debugging”, which naturally encourages continuous product improvement.

It is however important to identify sub-models, according to three variables: the role assumed by the project in the value chain, the format of the product sold (kit or pre-assembled) and the “degree of openness”, namely the nature of the licenses used.

### **Variable n°1: designer, manufacturer or distributor?**

**DO THE DESIGN, SUB-CONTRACT MANUFACTURING:** Just like Apple products “*designed in California, assembled in China*”, it is common for an open hardware player to sub-contract manufacturing in order to focus on the design. This is the case for well-known Arduino microcontrollers which are developed in Turin but mass produced by three partners, the main one being Italian-based Smart Projects (hence the *Made in Italy* label). Some models are also assembled by Americans Sparkfun and Gravitech. Only cards produced by these three players can be sold under the Arduino brand, the only element of intellectual property that is protected. Arduino guarantees the quality of its products to its clients and the support of its international community of makers and entrepreneurs, a claim that enables it to secure a comfortable level of sales (300 cards in 2011). Arduino products are then distributed directly by its three manufacturers which supply resellers around the world, as well as through the Arduino online store.

**MANUFACTURE AND DISTRIBUTE YOURSELF:** Other players assemble and distribute their products themselves, but also do so for third parties. This model is typical for amateur electronics and is embodied by Americans Sparkfun and Adafruit or the French Snootlab. These players design, manufacture and distribute a large range of electronic components for all kinds of projects, for amateurs and entrepreneurs. Sparkfun for example, distributes its own designed products and products designed by others, whether they are assembled by Sparkfun (Arduino Pro/Mini, Makey Makey) or not (Arduino Uno). The product catalogue is 100% open hardware. At the TEDxBoulder conferences in 2013, founder Nathan Seidle explained that Sparkfun creations were often cloned in six weeks, driving

them to focus their energy on the next product. He concluded: *“You may think I’m naïve or that I’m crazy, and that an open source hardware company is unsustainable. That’s ok. My 135 employees and I, our 75 million in revenue and our 431 unpatented products wish you the best of luck.”*

**INDUSTRIAL EFFICIENCY AS A BUSINESS MODEL:** For players that manufacture and sell open hardware products, the optimization of industrial processes obtained by the standardization of the components can prove to be an advantage in terms of safeguarding their business model. This is how Open Source Ecology, trained by Wikispeed in the agile methods of extreme manufacturing, became the leader in the superfast manufacturing of its agricultural machinery. Some machines, like the brick press, can be assembled in one day by a small team, allowing it to be sold at a fraction of the market price, yet with high hourly productivity.

### **Variable n°2: kit products or pre-assembled sale**

The majority of open hardware projects sell their products in kits, in a format that contains a pack with all the components required for manufacture, along with a free license notice. Many only offer products in this format, like the OpenROV underwater exploration robot and the Open Energy Monitor smart meter, because pre-assembly demands much greater resources. Players operating today, such as Chris Anderson’s company 3D Robotics which sells drones from the DIY Drones community, started out selling kits before adding pre-assembled models to their catalogue, at double the price.

### **Variable n°3: 100% open or with restrictions (NC, closed core, dual licensing)**

Some projects safeguard their competitive advantage by protecting part of their intellectual property. The first approach is to limit commercial usage, by using a Creative Commons CC-BY-NC license, for example, as the XYZ Cargo (open source cargo bike) project has done, or by using a dual licensing model. This model is popular in open source software, allowing for free use under a copyleft



license (compulsory identical resharing, including for spin-off products), or unrestricted paid usage. One last variant, still theoretical, is the commons reciprocity license put forward by Michel Bauwens, which allows free use by non-profit organizations and companies contributing to the commons, but which imposes a fee payment by companies that do not contribute to the commons.

The second method consists quite simply of partially restricting intellectual property. This is what 3D Robotics has done on the automatic pilots that their drones are equipped with, or Makerbot which has “restricted” its latest 3D printer models. It goes without saying that this approach has been criticized by the open source hardware community. Makerbot in particular, was initially built on the RepRap model, an open source 3D printer developed by a very active community, which felt deeply betrayed at this about face by the manufacturer. Makerbot was in fact acquired by Stratasys for approximately 400 million dollars.

### **Monetizing intangible (knowledge) with open source hardware**

Monetization of knowledge and skills is open source software’s main business model. While this is impossible to easily translate to the open hardware space, several projects are currently experimenting with this concept, sometimes as the sole revenue stream, sometimes as one of the components of a larger business model.

### **Selling expertise, advice, support**

Monetizing expertise via support services remains one of the simplest ways for an open hardware player to generate revenue. At the start of the Arduino journey, Massimo Banzi used his community’s creations to respond to the needs of his digital design agency clients. The Italian company then developed an offer for traditional players wanting to develop products on an Arduino board, like Intel which announced the launch of its Galileo microcontroller at the “Maker Faire” event held in Rome in 2013.



Another example is Wikispeed, a low energy consumption open source car which is designed and manufactured using extreme manufacturing. This method was adapted from agile methods of IT development. With its super-efficiency that is much higher than industry standards, it is a dream from many manufacturers. Players such as Boeing or John Deere are asking Wikispeed and some of its key team members to help them rethink their industrial processes, which will ensure that some of the team are remunerated (the project being non-profit up until now).

### **Selling experience and training**

Another type of intangible value that is relatively easily monetized is training and more generally, construction experience alongside an open source hardware project team.

Tripalium, a non-profit association, distributes an open source wind turbine, while Ti'Eole, a commercial arm attached to the project, finances it via the organization of internships providing hands on experience in the construction of the Piggott wind turbine. The interns pay for access to the theory and practical knowledge which, in addition to remunerating the two trainers, keeps a mobile workshop up and running. The cost of materials is paid by the apprentice who will acquire the wind turbine, and who benefits from the labor of the other interns free of charge. Ti'Eole adds to its revenue by providing installation and maintenance services for small wind turbines.

Wikispeed, mentioned earlier, only builds its cars to order for individuals, who are directly involved in their construction. Part of the value proposition is in the experience provided to clients, who contribute to each stage of the design and manufacture of their future vehicle alongside the Wikispeed experts.

### **Monetizing another product with open source hardware**

One indirect way of generating revenue with open hardware is to sell products that are peripheral or additional to the main open source project, which is itself



not necessarily “open”. Relevant examples include the classic case of numerical control machines, 3D printer consumables, or electronic components for Arduino handymen, as well as that of Tesla Motors.

Elon Musk, serial entrepreneur and CEO of the electric vehicle manufacturer announced that in June 2014 his company Tesla Motors would abandon the use of patents, making its cars open source. Beyond considerations regarding the practical reality of these statements, especially the lack of precision on the licenses used, keen observers would have noticed that with this bold announcement, Tesla Motors is in reality about to impose its technical norms to the whole sector, thus facilitating the sale of its batteries and charging stations. The manufacturer is in fact currently investing several billions of dollars in the construction of a battery “mega-factory” in America.

### **Managing an ecosystem: the platform model**

A unique model that is still emerging in the open hardware space, but likely to develop in the years to come, are the so-called “platform” models. In these models, a central player coordinates an ecosystem of designers, manufacturers and distributors around a common purpose or common specifications. This is the case for OpenDesk which enables designers to place the plans for their creations (offices, chairs, armchairs, etc.) under a Creative Commons license, whilst offering individuals the opportunity of ordering the furniture of their choice online and to have it “cut-out” by CNC at a makerspace or fab lab in their vicinity. Payment is then divided between the designer, the platform and the makerspace partner, who taps into an additional source of revenue and traffic.

***Elon Musk announced that  
in June 2014 his company Tesla Motors  
would abandon the use of patents.***

OSVehicle, another car example, the Italian-Chinese project officially launched in 2013, went beyond the sale of the Tabby kit, to offer an “open source hardware platform” for the creation of open source vehicles, to which different players will connect to form a “participative value chain”. This will allow the value created to be distributed between R&D, design, industry or service players.

## **Maker guidance**

Following the lead of machine tool and component suppliers, this last emerging model consists of the development of an offer designed for open source hardware itself, but this time at a support level. This can be in the form of makerspaces specifically oriented towards “entrepreneurs” including machine-time hire, training on tools, or technical guidance on projects. This is the model used by American chain TechShop, which could be compared to a Gym Club where “dream coaches” help you fulfil your dream by simplifying access to the machines, and giving you the knowledge required to use them. This is an approach that is also used by L’Usine in Paris. Open hardware incubators and accelerators such as Lemnos Lab and Highway 1 in San Francisco are also in this category.

## **Conclusion: toward a post-industrial production system**

Open source hardware may today still be a niche market with regard to traditional industrial practices, but in light of free software’s development, we can imagine that it might follow down the same path. Business models and development strategies implemented by communities and “free material” entrepreneurs are promising.

The sector as a whole must however meet many challenges, including how to enable projects to identify an appropriate position in the value chain, lessen the burdensome certifications and product quality processes prior to commercialization, put in place a new licensing system to “protect opening” of physical products (similar to patents), develop financing and support tools specific to



open hardware. It must also more contribute to widening the DIY culture and digital manufacturing to all, both of which are necessary for the growth of the sector.

Open hardware and distributed manufacturing are the seeds of a post-industrial production system in which goods will be produced locally for the most part, whereas knowledge will be exchanged freely at a global level. By relocating production, facilitating the repair and development of modular products, and by distributing capacities in a way that removes the boundary between producer and consumer, this system holds the promise of better wealth distribution and preservation of our natural resources.

— *Translation by Nicola Savage*

# WIKISPEED, THE OPEN SOURCE CAR

*Joe Justice began alone in his garage, the starting point of many American success stories. But for this 34 year old former management consultant, the location is apt. His flagship project aims to build and distribute a highly energy efficient, powerful open source car: the Wikispeed.*

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In 2010, Joe decided to participate in the Progressive Insurance X Prize, a competition offering a reward of \$10 million to the team which can develop a car capable of doing 100 miles per gallon of gasoline (a consumption of 2.3 liters per 100 kilometers). At that time, the only vehicles capable of this performance were more like bobsleds than cars, they could only accommodate one passenger and, above all, were not approved for road use.

From the beginning of the project, Joe shared his experience on social networks. Very quickly he found that he was not really alone in his garage. Forty volunteers from four different countries helped him to present a first working prototype within three months.

Designed and built for a derisory sum and with no real experience in automobile construction, the car moved up to 10th place in the general public category, ahead of a hundred big budget competitors such as Tata Motors, Tesla and MIT.

## **Like a Lego brick**

This “orange shoe box” was the starting point of ambitious development plans. The basis of the project is the implementation of a process, which is the



complete opposite to the bulk of traditional industry, where investments in production lines and standardized parts are usually so expensive that any changes are quickly discouraged. Joe Justice's team expanded quickly. From this point on, more than 150 volunteers from 18 countries, formed a pool of developers. There were former Apple employees, anonymous hackers, utopian geeks, and together, they designed the car in the same way that software is produced. Computing replaces the assembly line. The "agile method" of extreme manufacturing allows, by sharing information and real-time targets, to launch very short development cycles. Every seven days, "Sprints" are launched in order to arrive at an improved design model. It is work in progress based on continual simulations. So here we see a car designed like a Lego model. The eight components remain compatible regardless of improvements to each part. For example, a new off-road chassis can be designed in Thailand, while an Italian colleague refines a new-look dashboard.

## **Co-creator customers**

This open planning approach allows open participation in the innovation and manufacturing process. Customers are in fact the co-creators, involved in the car's improvements, each unit of which is unique. Using the Scrum method, which allocates each person a role, and open source software, Wikispeed has already managed to produce a sports car model for \$17,000 (selling for \$25,000). The performance is impressive: consumption of 2.3 l per 100km, 239km/h top speed and acceleration from 0 to 100 km/h in 5 seconds. All with innovative and ultra-light materials, simple electronic systems and engines based on the latest technical advances. This car, now approved for the road, should eventually come from micro-factories scattered across the planet (tests are underway to limit the manufacturing space to a simple rectangle painted on the ground) and will eventually cost \$1000 each. However, Joe Justice is not only fixated on cars as Wikispeed is simultaneously developing open source vaccines and medical devices.

— *Translation by Guillaume Barbareau with the help of Lucy Knight*

# TABBY, CARS IN KIT FORM

*Since Spring 2014, the Italian company OSVehicle has been marketing the very first open source automobile specifically designed for urban use. A revolution in the way of thinking about and manufacturing automobiles.*

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Until now, Ferraris – valued for more than 1 million Euros by catalogue retailers – used to be the most well-loved brand by consumers. But an astonishing machine sold in kit form for less than 2000 Euros could soon change the game. Tabby, delivered without any car body parts, is the brand new racing car inspired by transalpine car designers.

Since 2008, Francisco Liu (from Macao, ex-Cagiva and Pininfarina) and Ampelio Macchi (ex-Aprilia and Husqvarna) have been dedicating their energy to creating the very first kit car in this market. However, it could actually be defined as an “engine-powered platform” given that their machine is so simple and adaptable. The project branding clearly shows the philosophy behind it: “OSVehicle”, standing for “Open Source Vehicle”. This is a customizable car that is fully in line with the free software ideology.

## **A customizable car delivered as a kit**

Tabby will be delivered to customers, packed in cardboard boxes – much like the well-known Ikea furniture. Indeed, the buyer will also have his own role to play when putting the pieces together correctly. Just as if he had to deal with a giant Lego model, they will have to assemble the engine, with suspension parts, steering system, brakes and seats... then they will be free to select a car body, and to improve the designs, depending on whether this acquisition is for personal use or intended for resale.

If we consider the history of the automotive sector, Tabby’s heritage comes much more from the Ford Model T rather than the Testarossa. With a similar approach



to the Model T, which introduced optimization and rationalization through low cost manufacturing lines, Tabby is a cheap product whose manufacture is always triggered by a purchase order.

It can be assembled (at home) “in 41 minutes”, with basic tools. When they receive the product, the buyer has many building options, they are free to choose between 2-seater or 4-seater configurations, with 2, 3 or 4 driving wheels!

Tiny city car, golf cart, commercial vehicle or compact off-road vehicle: Tabby can take many forms and can be re-programmed over and over. All the plans and blueprints for Tabby are available under a Creative Commons license, and can be downloaded from the website’s download section.

### **“Let’s hack automotive industry”**

This vehicle designed for urban use, available for sale since spring 2014, intends to meet the expectations of both car enthusiasts’ and third party manufacturers’. In addition, it should also fit with emerging countries’ needs such as being low cost, taking a small area to build the product, requiring very limited workforce and resources, or being easy to adapt to face changing needs.

*“Let’s hack the automotive industry!”* is the catch cry of founders Francisco Liu and Ampelio Macchi. *“Innovators face large costs in acquiring standard vehicles, modifying them, and delivering them integrated with their services. We will enable this multi-niche transportation industry by building and adopting a set of basic, open, customizable and modular hardware platforms for vehicles that can be built and marketed through a distributed production network.”*, explains OSVehicle on its website.

The Tabby collaborative project, identified as the first to really take hold in the automotive sector, is part of many other 2.0 cars initiatives, such as Local Motors, Riversimple or Wikispeed (mentioned above). To go a step further, Tabby’s founders will still have to deal with regulatory requirements and comply with standards relating to road traffic safety concerns. For this next challenge, they will need, again, creativity, lobbying and perseverance to finally succeed in “hacking” high-speed roads.

— Translation by Cédric Belardi, with the help of Lucy Knight



# PROTEI: AN OPEN SOURCE MARINE DRONE TO CLEAN THE OCEANS

BY **BENJAMIN TINCQ** (OUISHARE)

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*Conceived by the young French-Japanese engineer Cesar Harada, Protei is a marine drone that can clean the oceans. It is entirely made of open source hardware technology, and was collaboratively developed by an international community. A product development approach which on many levels is very similar to free software.*

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Many of us still remember the horrible images of the spring 2010 oil spill that happened near the shores of Louisiana. Cesar Harada was there. Even more than the view of this black, viscous liquid flowing from the burning BP platform and staining the Gulf of Mexico, this young French-Japanese researcher was shocked by the ineffectiveness of the means used to clean up this pollution.

When he was working at the famous Massachusetts Institute of Technology (MIT) in a team that was developing a cleaning solution for the oil spill, Cesar came to the conclusion that the proprietary technology his lab was using was clearly not the most appropriate, while being also locked up by numerous patents. He then decided to leave MIT to design his own solution – an open source marine drone able to clean the oceans.



## **A funny kind of fish**

Looking at the cleaning boats using tons of fuel to recover only a tiny fraction of the oil spill (around 3%), it is clear that the room for improvement is enormous in terms of efficiency. But also in terms of health concerns. The current process is extremely dangerous for the marine officers carrying out these operations. Direct exposure to toxic chemicals is directly threatening their life expectancy at a worrying level.

Cesar's goal is simple yet ambitious: to develop an alternative oil recovery process that relies on clean propulsion, is capable of absorbing much more oil, is low-cost and does not threatens anyone's health.

The solution he came up with is Protei, a marine drone with a long tail acting as powerful oil absorbent, powered by the combined forces of the waves and the wind, and that can be controlled from the ground with a remote control. After several iterations, Protei now resembles a big fish with sails and its hull curves and rolls with the waves.

## **Open H2O, an international community**

Yet Protei's biggest strength is not only its technology, but the way it was developed, through the Open H2O community. Sailors, researchers, engineers, designers, entrepreneurs and industrial experts from all over the globe, came together every week to synchronize their work through a video-conference.

Technical drawings sent from South Korea, prototyping in the Netherlands, and the ongoing sharing of skills and experiences within an international community... this is what the open source hardware model enables.

## **A business model inspired by free software**

At the end of 2012, Cesar made the decision to split the non-profit and for-profit parts of his project. On one hand, Protei Inc., a robotic startup that manufactures

*Develop an alternative oil recovery process that relies on clean propulsion, is capable of absorbing much more oil, is low-cost and does not threatens anyone's health.*

and sells the drones and on the other, the OpenH2O community then incorporated as a foundation. The goal of OpenH2O is to develop open hardware technology for the oceans, that would be used not only for Protei, but also for other projects such as OpenROV (which makes small exploration submarines). The foundation would bring together a whole ecosystem of companies, some of them targeting a market similar to that of Protei itself.

The reason for this split is simple. Cesar wanted to protect the openness of his technology, with the end goal of serving the environment and human beings first, making this a priority before profit. Furthermore, the two organizations do not have the same objectives, the same time constraints, the same customers or governance. The split was motivated by ethical reasons as much as pragmatic ones.

The synergy between the two entities is a win-win relationship. Protei clearly benefits from the support of the global community for the R&D of its product, while OpenH2O receives financial and in-kind support from Protei, as well as feedback from the field that is necessary to improve the technology.

In order to secure a temporary competitive advantage, Protei publishes the open hardware sources of its products shortly after its commercialization, and not during the development. Doing this allows the startup to benefit from a short period during which it can generate a profit from its investment by selling drones before they can be copied. This approach is a bit similar to the iconic open hardware startup Sparkfun.



By separating non-profit (open source R&D) and commercial activities (product development and sales), Cesar Harada has mimicked in hardware a model that has already been proven in the FLOSS (free libre and open source software) industry. Indeed, the goal of foundations such as Linux, Apache or Mozilla is to “protect” the integrity of the source code and the community, while allowing a dynamic ecosystem to create commercial value that goes beyond the commons. This principle of synergy between the “knowledge commons” and the entrepreneurs, has been largely theorized by Michel Bauwens, founder of the P2P Foundation. Bauwens insists, however, that a “renewed public partner” should be the “enabler of the co-operation infrastructure to build and sustain the commons.”

### **On the road to success**

As a flagship promotion for the Protei project, Cesar finished in 2014 a boat world tour with the crew of Unreasonable at Sea, a floating incubator which gathered 10 innovative hardware projects with high social impact. Today, the Protei drone is 6 meters long, and pulls a 25-meter long absorbing tail which is able to collect up to 2 tons of oil and sea waste. Let’s hope that in the future it will embark on a journey to the “seventh continent”, this gigantic island of floating plastic that pollutes the Pacific Ocean.

— *Translation by Benjamin Tincq with the help of Nicola Savage*

# “THE COMMUNITY IS THE BEST TOOL TO DEVELOP AN OPEN PROJECT”

INTERVIEW WITH **CESAR HARADA** (PROTEI)

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*With the help of an international community, Cesar Harada has been developing Protei, an open source sea drone, since 2010. He explains why he made that choice and how he manages to fund this project.*

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**The Protei drone was developed by an international community and with open source logic.  
Why this choice of an open model?**

I come from a background where the open source approach is natural. When I had the opportunity to conduct research at MIT, my wish was to carry it out using that same approach. But after the first few minutes, I understood that would not be the case. My first contact with the team involved signing an NDA (Non-Disclosure Agreement) which prevented me from any exchange with the outside world about my research. So I decided to leave MIT to continue my work differently. This proprietary mindset seemed to be contradictory to the goal I pursue, that if we want to have a positive impact on the environment, we must do everything to easily make available what we develop to the largest number of people. The widest possible distribution, that's what allows an open approach.



## **What did you do after you left MIT?**

Once that decision was made, I found myself without the infrastructure to develop the project. Funding for patent expenses was incompatible with the resources I had. So I chose the CERN open hardware license, which I had contributed to since 2010. In this community, I feel among peers, we share the same aspirations, the same values, the same problems, whatever topics we work on. However, there is a concession I made to the old world, the Protei mark is registered. I was inspired by Arduino, which adopted this approach, openness around design and brand that allows us both to share technology and to ensure the quality of a brand, and the identity of our community. Open design also allows a faster diffusion of technology, unlike a patent which has a long lifecycle. If the technology connects with a community, the spread can be very quick and inexpensive. An open model also promotes improvements, diversification and forking of the original technology. You cannot get that shock wave in a closed model, unless you have a huge amount of resources to create and sustain it. An open model was a way for me to ensure the sustainability of the technology. When it is open source, technology has a life beyond the person whose idea it was or the company or the structure that supports it. Even if the organization fails, the technology stays and remains available. Last but not least, it is more pleasant to work in an open environment. It's unbearable for me to treat contributors like potential thieves and that's kind of what I felt when they asked me to sign the NDA at MIT. Transparency of work within a team is a real pleasure.

## **The difficulty faced by many open projects is to sustain their funding, especially in the case of products that require the material and industrialization. How did Protei manage to finance itself?**

We went through different phases, and we changed the funding model several times. We are in a story rather than in a model. At the beginning, in 2010, I was alone and I had self-financed the development for the first year. I used my personal resources (\$10,000) to manufacture prototypes in a garage in New Orleans. When I had things to show, individuals gathered around the project

***“If the technology connects  
with a community, the spread can be  
very quick and inexpensive.”***

and contributed. When the dynamic was there, I made an appeal to this community, “who would be able to leave their job to work full time on the project if funding was found?” In 2011, we launched a Kickstarter campaign, which allowed us to raise \$33,000 dollars. This funding allowed us to continue the work for almost a year, between 2011 and 2012.

### **After That?**

The following year was catastrophic. Protei’s darkest year. We arrived at the end of the resources and the investment funds that had expressed interest dropped us at the last moment. I spent 6 months in London without resources, trying to continue development in very precarious conditions. The winds changed in our favor when we won a \$100,000 grant from a US institution (Savannah Ocean Exchange) to finish the development. We used this funding to meet with boat users and build prototypes with them, during a four-month world tour, with a technology incubator aboard ship, the “Unreasonable at Sea”. We decided to settle in Hong Kong, and we found a partner who would design all Protei electronics as open source - SeedStudio in Shenzhen, China. In a few months we will be able to start selling boats. We invested our last resources in the industrialization process.

### **Where does your income come from? Sales only?**

Our income will of course come from the sale of products, but we also plan to develop applications and a platform. Another possibility is also the sale of analytical services based on the information we are collecting.



**The technology is open and now that the design is almost complete, a more or less well-meaning actor could therefore take up and market your technology. Is it a risk for you? How do you deal with it?**

We build boats in the way that they would be manufactured in a fab lab. We are heading towards a distributed generation model, which is one way to guard against that type of risk. More generally, this means that we have to be better and faster than those who would copy us. We could even say that being copied strengthens us. This is what happens with Arduino. There are so many copycats, the fact is, the more they multiply copies, the more the original grows and becomes reliable. What is important is to have a technology, but especially a community that supports it.

— *Interview by Louis-David Benyayer*

— *Translation by Guillaume Barbareau with the help of Lucy Knight*



# OPEN & AGILE MANUFACTURING: OPPORTUNITIES AND OBSTACLES

BY **MARTIN KUPP** (ESCP EUROPE)

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When talking to executives from manufacturing companies, especially large industrial goods companies like Siemens, Bosch, or Schneider Electric, they seem to have one common question: how can we gain speed, become more agile in a fast changing environment and, last but not least, become more open for new developments, both in technology and customer needs?

It is important to understand the drivers of this development. For the last five years since I have been working closely with companies on the challenges of becoming more agile and open, I have heard mainly three reasons why these topics have become so important. First of all, many large companies that have built excellence in producing large volumes up to detailed specifications observe that requirement changes during the product development process are becoming more and more common. The german automotive supplier Bosch, for example, is experiencing this in China where not only the lead-time is dramatically shorter than in Europe or the United States, but Chinese car manufacturers are also frequently changing their requirements shortly before the start of production. This is also supported by research and has of course tremendous impact on the manufacturing process. With last minute requirement changes it becomes more difficult to secure enough lead time for manufacturing. A second trend is smaller order sizes. With a lot more product variations being introduced in a short time, order sizes shrink and the manufacturing process has to be more agile to react. The so-called “long-tail” effect is one example for this. The german company Dräxlmaier is an extreme case. They are producing customer-specific wiring harnesses for the automotive industry. Customer-specific means that



there are no two cars produced on the same day or even week with exactly the same wiring harnesses. Each wiring harness is produced to the specifications of the end-user! Last but not least, we observe that the distinction between hardware and software is becoming obsolete with more and more software being integrated in hardware. Nest, the company that builds thermostats and smoke alarms and was bought in January 2014 by Google for a mere 3,2 billion US dollars, is on the one hand a hardware company building home appliances but at the core is a software company allowing the seamless integration of these devices with the internet of things and services. With traditionally faster development cycles for software, companies have to come up with ways to adjust the hardware development cycles accordingly.

This raises an interesting question: is manufacturing going full cycle? Are we going back to what manufacturing was at the beginning? What I mean by this is that, when we look into the history of manufacturing, the beginnings were what we would call today agile and often also open. Order sizes were typically rather small, customization common, partnerships with suppliers and customers normal. It was only during the industrialization and especially with the invention of the assembly line and the popularity of Henry Ford, that we saw large scale manufacturing and finally mass manufacturing.

There are, of course, some technical answers to the above mentioned challenges. Companies have developed technologies like the standard for the exchange of products (STEP), concurrent engineering, virtual manufacturing, lean manufacturing, object oriented architecture of products, agile product development and also found new ways of working together like scrum. Apart from these more technical solutions I would like to share three success factors that I have seen in companies tackling successfully agility and openness:

### 1. People over process

For good reasons, the mantra people over process is also the first value of the agile manifesto, developed in 2001 by a group of software developers. Companies have to think about new ways of making work stimulating and self determined. Agility and openness can not be forced on people.

## 2. Involving supplier and customer and community management

I truly believe that companies should start with their suppliers and customers when opening more up. They are not only the closest to the company but also the most crucial for success. This is a big difference to software companies where suppliers are often not as important. Key to successfully managing suppliers and customers is to start giving before asking (proactive attention) and to be very responsive once you do get feedback (reactive attention).

## 3. Good quality data

Last but not least, the quality of the data that companies collect and analyze during this process will determine their ability to react quickly and effectively to changing markets and technologies, smaller order sizes, and an ever faster innovation cycle often driven by software developments.



**“Those who do not  
engage in open  
and collaborative models  
are not in a position  
to win the digital battle”**

**GILLES BABINET**

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*Gilles Babinet is an entrepreneur. He represents France at the European Commission as a "Digital Champion". He published The Digital era, a new age of humanity, 5 changes that will turn our lives upside down (Le Passeur, 2014). His credo? Go far from ideologies, experiment, discuss, fail, and try again!*

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- *Your book is filled with open and collaborative approaches which you describe as "evolutions inherent to the digital economy." At the same time, you make a clear observation about the difficulty of certain players to assume openness and collaboration. How do we promote and strengthen these open approaches? What tools do you plan on using?*

- It is true that some institutional economic players have major difficulties taking into account the changes driven by digital solutions. Some disruptive initiatives, in education for example, have not yet found their way to sustainability. It is certainly experimentation that reinforces these open and collaborative approaches. In many areas, one would benefit from getting out of the ideology and getting closer to science: build hypotheses, test them, analyze the results, and repeat until you find a model that works.

In education in particular, the United States has followed this path. They started off with an experiment in Florida and analyzed the results. Today they are trying to expand nationally. In France, we tend to remain stuck on ideological positions, we oppose them, and feed a debate that generates too few experimental initiatives that would enable us to better understand and define paths to follow. Effective dialogue can also be leveraged. The Internet helps people think about an issue together. It is through dialogue, by bringing together start-ups and large groups as well as politicians and citizens that we will improve our understanding of these phenomena and these paths to follow. In this way, we will together be able to define experiments to carry out.

The typical digital way is to try. Try and fail. The great plans and great strategies driven by ideology are inconclusive.

- *In your book, two types of actors occupy prominent places: the innovators and the digital giants. However, old corporates are virtually absent from your thoughts. Does it mean that they have no role to play in this new era, have they already lost the fight?*

- On the contrary, they have a big role to play. Together with Nicolas Colin I wrote an article about the difficulties groups listed on the CAC 40 face with regard to digital solutions. Following this article, I had the opportunity to meet with many CEOs and I must admit that the crushing majority of them do not fully understand what is happening. What I describe in my book applies to institutional actors and policy makers as well as to leaders of big groups. This is not surprising in that they have similar education and as a result make the same mistakes.

- *Do you have an example?*

- Yes, a story illustrates this misconception perfectly. I met with the manager of a hotel group. He talked to me for an hour about the repositioning of his brand and his marketing strategy. After this long speech, I questioned his views on the changes occurring in his sector and the place digital intermediaries occupy today, highlighting that they hold 25% of the market in terms of value. He replied that he does nothing and that there's nothing to do about it. He adds that some of his competitors contacted him to suggest jointly driven actions but that he declined. It's a triple mistake. Thinking we can do nothing, doing nothing and staying alone. I do not always feel that there is the necessary awareness from these big and established groups. However, digital players increasingly attack them. They act relatively little and experiment even less. They are taking a big risk.

- *Is this problem specific to France?*

- No, this is not a French peculiarity. We find this attitude in other countries, even in the United States. However, some groups like General Electric stand out, groups who led several significant initiatives in terms of mobilizing the masses (crowdfunding, partnership with Quirky...). Some actors have understood the move towards "corporate platforms". They are few. It's also a conditioned reflex from the ones whose positions are threatened. They devote most of their efforts defending the model that allowed their domination and little of their efforts – or none at all – are devoted to making their model evolve.

*“I had the opportunity to meet with many CEOs and I must admit that the crushing majority of them do not fully understand what is happening.”*

- *With this new digital era, we can see two possible scenarios: emancipation of the individual and domination by platforms. What will bring us more towards one or the other of these extremes?*

- Regulation has a determining role to play and is twofold: promote initiatives that contribute to emancipation and regulate dominant positions. Regarding the first role, the state may establish regulations favoring crowdfunding, for instance, and more generally favoring the sharing economy. It can also give incentives to companies implementing open APIs. Finally, it can provide a framework to the contribution principles in place at Wikipedia for example. Regarding the second, it concerns the mandate of competition authorities in Europe and in the United States. The problem is that dominant firms are legally heavily armed and that authorities sometimes struggle to follow. This is a critical issue as we must avoid creating dominations leading to disproportionate income, which is particularly effective in network economies. It seems normal that innovation outweighs the established order, but it is less normal when those who have deep pockets win because they have more available resources and can suck others dry via dumping. More generally - and it is the topic of a section of the book - upcoming regulatory changes are enormous. It is very likely that we are about to see a significant regulatory cycle.

- *In which areas?*

- Labor law, the workplace, intellectual property rights and taxation. The principles that guide us today emerged from the Second Industrial Revolution. They had already disrupted those of the first Industrial Revolution. There is little doubt that they will again be redefined during this new digital era.

- *The book ends with an observation: the lack of utopias. Where to find them?*

- To be a little bit provocative, I will mention some of my friends, who have been involved for many years in the Larzac communities. These communities have very structured operating rules and particularly interesting exchange rules. These rules are not only based on ideology, they also embody a utopia. Whether or not one adheres to it, whether one agrees or not with its assumptions, this utopia is useful to public debate. One would benefit from involving the leaders of this utopia in public debate, especially as those who drive and follow a dream are rare and often have the ability to debate and argue differently. We all have to learn from dreamers.

— *Interview by Louis-David Benyayer*

— *Translation by Céline Conrardy with the help of George Husni*







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*presented by*  
**YVES ZIEBA**

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**EDUCATION**

## YVES ZIEBA

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*Yves Zieba studied strategy at the ESCP Europe and marketing at HEC Montreal. He has worked for Arthur D. Little, Safran, Total and Thomson Reuters. Over the past few years, his consulting work has led him to run strategic programs for clients in many industries (banking, high-tech, commodities, energy trading, asset management, etc.). He has lived and worked around the world (Berlin, Paris, Montreal, Casablanca, New York, Singapore, Hong Kong and London).*

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# MOOCS: 8 BUSINESS MODELS TO UNDERSTAND THE MONETIZATION TACTICS

BY YVES ZIEBA

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*Traditional learning systems are undermined by the emergence of online courses, the now famous MOOCs (Massive Open Online Courses). But this generic term actually covers a wide variety of business models.*

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## How do MOOCs change the business models of education?

Courses and online social interactions between learners are growing strongly. MOOCs disrupt the traditional standards and methods of knowledge transfer. The technology allows a new approach to training and pedagogy and could make it potentially available for most of us. Movers and shakers use new technologies to destabilize old-fashion ways of teaching. Market players are experimenting with new possibilities, leading them to question current models and to search for economically viable models for the educational content they produce. As is often the case with cutting-edge innovation, new services and new players are emerging. A new model with a less centralized and a more distributed ecosystem of education is appearing and we are seeing multiple challenges caused by MOOCs, notably:

- › Customer segments: B2B (training) and B2C (teaching)
- › Offer structure: the professional production of media content, specialized training or individualized tutoring.

- › Distribution channels: new distribution platforms of educational content
- › Key resources: analytical skills and data security, community creation, design and management
- › Revenue streams: selling the data
- › Value proposition: tests, certificates and credentials to guarantee a level of quality and expertise.

Each of these elements has its own mode of operation, and many new specialized players logically appear. There is not one single business model for MOOCs, there are many. There is an economic model for the delivery platforms for content distribution (like Coursera, edX, FUN...) and another model for universities, business schools, and training institutes, which create and own content and a body of knowledge. Similar to the publishing industry, there is a business model for the distributor and another business model for the content editor.

## **1. The traditional B2C or B2B teaching model**

B2C model (Business to Consumer) is essentially based on certification. After successfully passing their exam, students must pay for their certificates, their accreditation (“quality assurance” for taking the course). The platform offers identity verification services for those wishing to obtain an official validation of their results. On the platform, the more you increase the value of MOOC certification, that is to say, the perceived likelihood of the learner’s future employability, the more revenue you can generate from the platform. But who benefits from these revenues? The platforms, the universities, or both? Learners who wish to graduate must pay a fee once they have passed all stages of the course (on Udacity for example, taking the exam costs \$89, while Coursera uses the concept of a “verified certificate” fee). Ideally, a business model MOOC has a higher completion rate (i.e. more students take the course until the end), especially if the revenues depend on the issuance of the certificate. Some courses must be prepaid and this increases the rate of learners who complete the course. According to Coursera, 20% of learners are willing to pay to get the official certificate attesting their success.



B2B teaching model (Business to Business) based on traditional public-private partnerships where ministries, NGOs or businesses pay to create their own online courses for different purposes. For example, a large multinational with thousands of employees considering online courses for corporate training. Universities and corporations could also work together to co-create educational content.

## **2. Reaching out to a new audience, new communities of learners**

MOOCs allow education to be an industry where entrepreneurs and investors can bring new ideas and resources, something unthinkable only few years ago! Many companies are working to create online courses to platforms and distribution services for employers. The number of courses in the global directory is likely to explode quickly. Reaching new learners means accessing new revenue stream opportunities. MOOCs also target a wider audience, whose needs are not fully covered by traditional lifelong education institutions. For example, entrepreneurs who generally do not have a taste for e-learning participate in MOOCs for networking, french speaking African students participate in MOOCs' business and engineering schools without having to pay tuition fees, or do several years of preparatory classes. Everyone can now take a course at Harvard or Stanford online.

## **3. The free model: open, free and responsible**

This third model, the basis of the MOOC phenomenon, offers students easy access to content and courses. To make education accessible, the online "course" and access directory are totally free for learners. How then can we at least cover video production costs and pay teachers or authors? How do we pay for the production of these courses if the entire margin is taken by the platform, and who will pay for teachers? By donations or foundation funding. The most famous example is the Khan Academy. Different players have positioned themselves specifically and differently simply because they do not all have the same constraints. Coursera, for instance, is a technology

startup that has chosen not to be open source. Coursera dominates the market in terms of number of learners, but some voices regret the growing complexity of its approach to design courses. edX is the other leader in this market. It is a non-profit organization, which also launched OpenEdX, its open source equivalent. For both leaders, the revenues are shared between the platform and providers of educational content. FutureLearn is a private English spin-off, created by a public university close to the BBC, which is not facing the same financial constraints. It has equivalents in many European countries, including France (Fun), Germany (Iversity), Italy (Federica) and Spain (MiriadaX) even if each project has its own specific advantages.

#### **4. Poker model - Different visibility levels: you pay to see!**

The program directory is generally visible, with paid or free courses. Sometimes, learners must subscribe to access the full online course directory, with different service levels. In this case we can refer to the “Netflix” model, that is to say, a business model of on-demand content with recurring revenue. This is the model proposed, for instance, by Lynda.com (acquired by LinkedIn) or OpenClassroom packages (monthly or annual packages). In exchange of a subscription, the learner has access to all videos and new courses every week.

For example, in Canva, academic or corporate content providers collect all income related to the course they create, but they pay for a license, a right to use the Canva platform. Pricing factors and commercial strategies can then include the prestige of the institution, the duration of the course, the teacher’s reputation, the production cost, the video quality level, and the number of videos offered by a given MOOC.

#### **5. The mixed training model or “blended” model**

Online “courses” are made available to learners as free supplements to the traditional courses. It’s an improved version of the good old blended learning (mixed). This model exists for educational companies that still depend on



their old business models, and are trying to transition towards a MOOC model without cannibalizing their existing traditional income streams.

The MOOC then serves as a “marketing teaser” or promotes “branding elements” to attract new learners into the traditional admissions process. In this case the content available inside the MOOC is at a basic level. The learner is then encouraged to register for a normal on-campus, and more advanced follow-up courses. Alternatively, the learner can be offered a personalized educational curriculum with customized fees.

## **6. The two-sided model**

The course is free for the student because the student is not the client. The platform “offers” the course to the learner, but resells the learner’s data to advertisers, employers or recruiters. This is why it is important to read the terms and conditions of the contract to understand if the protection of personal data and intellectual property is acceptable to the user. In this case, the exam results for each learner and their current portfolio of courses (taken, failed or successfully passed) are stored in the cloud for companies (possible employers, headhunters, investors) to be able to access them. A large number of clients - academic or corporate - are not very sure of what is happening when a platform like Coursera or edX decide to “share” their users’ data. A “recommendation” service for the best learners can thus be created and of course monetized.

## **7. Freemiums and additional paid services**

The video resolution quality is highlighted, as well as the quality of the teaching methods, the level of the teacher’s reputation, optional access to lecture notes, or to case studies, or alerts about new courses available, can all become additional paid service options. What could be included for free in a course can also become a paid option. Tutoring also becomes the premium of several freemium models. Strong growth can also be seen in service



networking and social activities associated with the MOOCs. For example, Coursera and edX multiply meetups in every city, and business schools invite project holders spotted in MOOCs to join their Facebook groups.

## 8. External services

A company that does not have the experience to create a MOOC outsources online course production to an existing platform, with internal and external stakeholders (a community manager, a project manager, developers for specific sections, data scientists for big data, analysts, business consultants). A company or an educational institute can even acquire its own platform to produce its own MOOCs. Given the scale of investment, it should think carefully about the relevance of this decision and to be able to compete with other existing offers.

As each player comes from different backgrounds (publishing, video, academia, media, corporate), it is likely that these models and others will continue to co-exist. The new entrants continue to innovate in terms of business models to challenge existing dominant market players. This should speed up the transition of the education industry towards the digital space, and the colossal transformation of knowledge so well described by Michel Serres (*Thumbelina*, The Apple Tree, 2013) and Bernard Stiegler in comparison with the written alphabet and printing revolutions.

— *Translation by Yves Zieba with the help of Andi Argast*



# THE KHAN ACADEMY: THE ONLINE SCHOOL FOR ALL

*Free access and open to all, the Khan Academy is an online school consisting of a database of over 4000 video tutorials. Whilst it first focused on mathematics, this teaching method is now available in all fields and in all languages.*

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There is no doubt: Salman Khan is the most popular mathematics teacher in the world. This 37 year old American, of Bangladeshi and Indian origin, with a collection of MIT degrees, teaches over 80 million students around the world. He never gets angry and you never see his face. It's now been seven years since this super tutor revolutionized the ways of learning theorems, fractions and other geometric problems via YouTube videos (under a creative commons license) .

Everything started by chance in 2004, when Salman's cousin Nadia asked him to help her with mathematics. Using Yahoo's Doodle notepad, he developed his first methods. The results were encouraging and, after two years designing his online classroom project, Khan launched his now famous "Academy" in 2006, before finally quitting his job in finance in 2009, to focus his efforts full time on his new project.

## **Over 4000 videos**

The Khan Academy, mainly financed by sponsors (including Bill Gates, a big fan from the outset), now includes over 4000 mini video lessons. In mathematics of course, but also tutorials on economics, history, biology, computing, etc. All this content is operated according to the same pedagogical model which has become the Khan galaxy's trademark: ten minute videos

featuring an animated blackboard, as if it was positioned horizontally next to the student, with a voiceover (albeit often in quite a serious tone) explaining the issues as if telling a story.

If this virtual and free school thus removes the teacher as a person from its “tutes”, Salman Khan’s goal is not to eliminate the need for human teachers and close down schools. On the contrary, he sees his program as a support for the theory taught in the classroom, acting as a complementary tool alongside practical exercises in class. His classes have left the home computer to join computer labs in many American schools and act as a base for programs run by many NGOs around the world, especially in India.

## **Translation work**

Today, the Khan empire continues to expand. The goal of the founder of the most famous MOOCs is indeed to create “hundreds of thousands” of new tutorials. Even though he remains at the head of his eponymous method, he now has a team of around fifty employees working from a very cool open space in Silicon Valley, in order to improve his videos and promote teaching. A pool of PhDs is also working on new lessons, under the supervision of an *ad hoc* scientific committee. But Salman Khan does not intend to limit himself to tutorials in English. His new project relates to translation of his online courses. The goal over the next few months is to make them accessible in the most widely spoken languages in the world. In France, it is with the support of the Bibliothèques sans frontières (BSF) - Libraries without Borders association, that the translation project was launched in September 2013. From primary to high schools, one thousand online courses are already available. And that’s only the beginning.

— *Translation by Nicola Savage*



# UDACITY: THE DIGITAL UNIVERSITY IN COMPUTER SCIENCE

*By emphasizing student experiments, Udacity  
– a collection of free online courses, has become  
a leading learning center in new technologies.*

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On a resume, graduating from Stanford is a guarantee of excellence. 3 alumni from this famous Californian university are on the way to promoting a new international label, an aboveground training, with no campus nor admission fees: Udacity, the private education site they created in 2012, has become the reference in e-learning.

Sebastian Thrun, David Stavens, and Mike Sokolsky started this venture after attending a class in search-engine creation and self-driving car programming. Their goal was to design and implement an e-learning platform for everyone. Developed in Python, Udacity offers a hundred courses, from beginner to advanced levels. You can learn how to start a blog, build a software or program robots.

## **A flexible university**

At the beginning, the Udacity service was quite inflexible, following traditional university standards such as scheduled courses, pre-registration, automated corrections, no feedback... But step by step, the service introduced interaction and flexibility which has now become the trademark of this online university. With more than 1.6 million students, the service has become a real community. Once they join, the user can converse with their teacher, corrector, and classmates – who can all take the same course anytime and anywhere around the globe,

provided they can access the Internet. Ads, wiki, forum... Each module is an environment in its own. You can browse videos, tutorials and pass quiz tests on-demand, at your own learning speed. Here, a “TA” (Teacher Assistant) drives the practical exercises, checking for good comprehension of each stage.

### **“Learning by doing”**

Udacity chose to play it fully digital, and delivers a certificate after completing the exams, providing credentials that add value to a resume and that are now becoming a real advantage in recruitment. Pioneering the MOOC movement, Udacity connects flexible e-learning with real-life usage. Applying the *learning by doing* principle, the program supports student projects and emphasizes tangible applications: build your own search engine, or your own artificial intelligence for example. In the fall of 2013, Udacity jumped into corporate courses, based around big data challenges.

So here we see how anyone can become an advanced coder without leaving his sofa. Mentioning a Udacity degree on your resume will bring you the pride of graduating from a global university – in addition to wearing an American college style Udacity “U” tee-shirt of course. A partnership with Pearson VUE, a company specialized in credentials authentication, now allows you to validate your online or IRL (In real life) academic record through an examination sat at an affiliated center (in France, Nantes and Paris).

— *Translation by Huy-Canh Duong*



# “A MOOC CREATES SOCIAL TIES”

INTERVIEW WITH **PHILIPPE SILBERZAHN** (EMLYON BUSINESS SCHOOL)

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*How do MOOCs question the business model of business schools? Some answers from Silberzahn Philippe, Professor of Entrepreneurship, Strategy and Innovation at EMLYON Business School and researcher at the Ecole Polytechnique. In November 2013 he created the first French MOOC on Entrepreneurship, dedicated to a new entrepreneurial logic called “effectuation”. The project brought together about 20,000 participants across three versions. Philippe Silberzahn presents his vision, between pedagogical motivation and innovative business model.*

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**One can imagine that for a teacher of entrepreneurship, the issue of MOOCs is two-pronged: it is an educational device for teaching but also an innovation for the industry. How do you understand this phenomenon?**

Creating this MOOC on entrepreneurship came primarily from a desire to innovate. I am interested in innovation and I work in an institution, the business school, whose business model is losing momentum and is surrounded by initiatives that attack it. Corporate and peer-to-peer universities are just one example. I got interested in MOOCs in the summer of 2012 with the desire to explore a business model innovation track for a player who has to respond to a changing environment. I was lucky enough to get the go-ahead to create a first MOOC in the fall of 2013. It was primarily an experiment to understand what changes would be required in educational and economic terms. Of course, being a teacher, I am interested in pedagogy, and the MOOC is a new way to teach to a new audience, but my primary motivation is that of innovation, not education.

**After this first experiment, what are your conclusions?  
What does a MOOC create?**

There's a real pedagogical impact. The testimonials of participants prove it. Many people express themselves spontaneously to explain how they were impacted. The second important aspect is the collective dimension in that a MOOC creates social ties! This is a collective emotion similar to that of a concert. Beyond watching the video, it is the exchanges that take place on the platform that make the MOOC a really impactful experience. The peer-to-peer learning is a powerful reality.

**You speak almost as if you were a new entrant in the sector.  
We imagine that in an established institution, the dynamics of openness  
induced by a MOOC are not obvious, requiring changes, disruptions...**

Clayton Christiansen, disruptive innovation theorist, already identified the fact that it is very difficult to accept a new business model within an established existing institution. A MOOC in a business school is no exception to the rule. It's really difficult to integrate as it does not correspond to a line of business or an academic department. In addition, some insiders may perceive such initiatives as a threat to existing businesses. It is clear that most institutions are in a similar situation. They were pushed to make one or two MOOCs and now they all wonder about the integration of this innovative method in their model. Some have partnerships with MOOC platforms like Coursera to establish a presence with minimal resources. We initially wanted to control our own technical solution so we worked with a platform provider with an unbranded solution. But this is difficult to maintain, as the institution is reluctant to invest more, so our future MOOCs will be on Coursera.

***“The peer-to-peer learning  
is a powerful reality.”***



## How do you imagine the future of this educational innovation?

For all the disruptions brought about by MOOCs, and these are real, it is likely that existing schools will maintain an important role in education, especially for gaining qualifications. I also find that the classroom has virtues that distance education don't have, and I imagine that a hybrid model has some relevance. The impact on the higher education business will certainly be important: there will be new sources of value, new entrants with different models... The landscape will be changed, and not only in pedagogical terms.

— *Interview by Louis-David Benyayer*

— *Translation by Philippe Silberzahn with the help of Ian Watt*



# “MOOCs ARE PART OF OUR DIGITAL STRATEGY TO ASSERT OUR LEADERSHIP”

INTERVIEW WITH **OLIVIER FARON** (CNAM)

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*Olivier Faron is deputy head of the Conservatoire National des Arts et Métiers (CNAM). He discusses what is at stake in new educational formats for the CNAM, which has embarked on the MOOC adventure.*

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## **What has motivated CNAM to create MOOCs?**

The CNAM has been in education and training for several centuries. Today, we are a major stakeholder in distance teaching and we are active throughout France with around thirty centers. The topic of education and teaching methods is part of our DNA and it seemed natural to take an interest in MOOCs as a teaching method. The concept of MOOCs fits into our digital strategy, for which we invest significant resources and which will enable us to hold our leadership position in the training sector. Finally, it is a way to meet our audience's expectations in France and in French-speaking countries.



*“This dynamic of openness and partnerships influences our existing activities.”*

### **What were your achievements and what were your conclusions?**

We launched four MOOCs which are available on the state-run FUN platform. In every instance, these MOOCs were the result of the intersection between, on one hand, the team's desires and, on the other hand, public expectations. Those four achievements are very different in their content, their methods and their audiences. They enabled us to deploy a full-scale test of our technical platform. We then have been able to assess the interest in MOOCs in terms of the appeal of our other programs. Moreover, and it was not foreseen, we see another activity taking shape, that of adapting content into MOOC formats for third parties.

### **For instance ?**

The MOOC “From manager to leader” is the most successful one. We counted around 40,000 subscribers with an attendance rate of 20%, which is in the average of what we observe for other initiatives. The epidemiology MOOC attracted 50% of its audience outside France, primarily from French-speaking West Africa. There are four dimensions to the MOOCs: the content, the technical platform, the educational presentation and the learners' community. The content is our main strength and today the technical platform is no longer a differentiating factor. We are focusing our efforts on the last two points: educational presentation and, even more importantly, community management. A MOOC that works is efficient in those four dimensions. We are currently learning and making progress on which tools and methods we need to develop to guide and follow up with the learners during and after the lesson? Finally, beyond our own initiatives, we can clearly see that the topic of the editorial line

matters. With the content growth it has become crucial to enable people to find their way within this content, to make their choices and to ensure progress. When we produce content, it has to be in relation with the existing material.

**To what extent are the MOOCs, which are free, cannibalizing your other teaching offers? How do they fit within your other offers?**

The training we offer leads to a qualification and this is our main activity. The MOOCs are an important tool for visibility and communication, but do not directly compete with our other offers. Furthermore, as I already mentioned, we could even develop a new activity around MOOCs. The topic that drives us is convergence. MOOCs are a tool amongst others and our challenge is to give those tools consistency so that they support each other and contribute to one another. The risk is putting offers next to each other that do not connect. For example, we also have invested significant resources in serious games and we are committed to synchronizing our actions for MOOCs with them. Finally, those new initiatives will enable us to interact with new stakeholders who we did not speak with before, in France as well as abroad. This dynamic of openness and partnerships influences our existing activities and these new initiatives contribute significantly to greater opening up of our institution to the outside world.

— *Interview by Louis-David Benyayer*

— *Translation by Julie Robles with the help of Ian Watt*



# “OPENNESS IS OPENCLASSROOMS’ DRIVING FORCE”

INTERVIEW WITH **YANNIG RAFFENEL** (OPEN CLASSROOMS)

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*Yannig Raffenel is the head of the editorial team at the open education platform, OpenClassrooms. He explains his platform’s business model, which reconciles openness and an economic balance.*

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**OpenClassrooms is part of a group of new actors forming new methods of education. How did the adventure begin for you?**

At the beginning, Mathieu, one of the two co-founders, could not find any relevant content on learning HTML, the computer coding language. So he managed on his own, picking up information and using tools from all over the place, and then he put a tutorial online with the tools to make other tutorials. He was 13 years old at that time and so all this began through the frustration of a pre-teen!

**And then?**

Then there were many other people following him and using his tutorials, and some of these followers were people who also created educational content online. 13 years later, 730,000 people are registered on the site and 1,000 courses are available online. About 10,000 people are connected at the same time all

day long, and the site has 2, 5 million unique visitors every month. Initially, course topics were mainly linked to IT development tools and were progressively broadened to include science and entrepreneurship.

### **What are the necessary skills to run a learning platform such as yours?**

The three main skills are technical administration of the platform, editorial skills, and monetization. The technical administration mobilizes a team of 12 people and all of our developments are open source. The task of the editorial team I manage is to build the pedagogical engineering platform which will ensure that the course will be followed and optimized for success for the greatest number of people. We assist content producers by bringing in dedicated pedagogical engineers so that they design the best modules and we organize the assessment between peers. It is less talked about, but another innovative part of our activity comes from trainees who grade the tests. The learner is also the corrector. This is what allows us to grade 5,000 tests in 48h for our most popular modules. The last activity is communication and promotion of our courses which is through management of our student community (registered on the site or not) and monetization.

### **Access to the site is free. What is the business model of OpenClassrooms?**

Concerning revenues, our model has evolved over time. In the first years, advertising provided the funding for costs linked to the technical operation of the site. For the past five years, OpenClassrooms publishes the content of courses offered on the platform as books and e-books. These publications represent 50% of our revenue. Over the past 6 months, we have launched a *premium* subscription offer. In this offer anyone can, for a 9, 99€ per month subscription, use the site without ads and download unlimited videos and up to 3 e-books a month, and, above all, be eligible to take all certification exams. This offer was launched in September of 2013 and we will certainly go beyond our goal of 10,000 paying subscribers before the end of the year 2014. Of course, our content stays fully available for free with our freemium offer. In



***“Some people forget  
that one of the O  
in MOOC means ‘open’.”***

addition to the courses produced by the members of our community, who are experts in their field, we have more and more partnerships with producers of professional content (for example professors and educational institutions) who we co-brand content with. We are not a MOOC agency, we do not provide services to create resources, but we co-produce the MOOCs with these partners, then we share the revenue equally between all content authors who are our co-producers.

### **Beyond free access to content, what is the openness dynamic at OpenClassrooms?**

It is true that we sometimes feel that some people forget that one of the O in MOOC means “open.” This is particularly true in terms of time. Almost all MOOC platforms are quite closed in this regard in that courses start at a set date and time and have a predefined rhythm that is the same for all students. We opened 60 MOOCs in 2014. They can all be started anytime and their modules can be followed at the user’s own pace. Why does the one who has time and feels like following one module per day should be slowed down by those who can or want to follow only one per week?

— *Interview by Louis-David Benyayer.*

— *Translation by Anne-Sophie Payen with the help of Caitlyn Hutchison*

# EDUCATION RELOADED: DISRUPTIVE BUSINESS MODELS IN EDUCATION

BY **MARTIN KUPP** (ESCP EUROPE)

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New business models are disrupting industry after industry. One industry where everybody is expecting big disruption and new business models is education.

Very often, these business models are driven by newly available technologies that enable producers to get in contact with consumers without a middleman (e.g. EBay, Airbnb), new forms of cooperation along the value chain (open innovation, mass customization), new revenue collecting mechanisms (crowdfunding, PayPal, square) just to name a few.

Education as it is today is broken and this is well documented. It is elite, typically one-way, not personalized, and expensive and is reaching – even in developed countries – too few people. The big disruption that everybody is talking about are so-called Massive Open Online Courses (MOOC). They are obviously not elite, they are open to everybody, and reach a lot of people – some MOOCs have more than 130,000 students).

But experience has taught us that industries are rarely disrupted by a single new business model but with a whole array. And while MOOCs solve some of the issues in education, they are still typically a one-way learning experience and elite in so far as up to now only very few elite universities have the means and ambition to produce and distribute them. And personalization very often only goes so far as allowing students to learn at their own pace.



But what they learn in which order is still imposed upon them.

We therefore see the opportunity for other business models in education to be established. One that we have been working on at ESCPEurope for the last 8 years is what we call Open Co-constructed Courses (OCC). These courses, for example our Paris Factory program, are open and free (or at minimal cost) to everyone, highly personalized as they are co-constructed, not elite, and most important of all multi-directional which means that teaching and learning is done by and for everyone.

## **Open**

Here, open means that everybody that wants to learn and share can take part in the program. There are no academic or other pre-conditions. Everybody can apply by explaining what they are interested in and what they are willing to share. But as the program is not online, there is as for now a restriction due to the room size and number of chairs in a room. But we are working with larger and larger settings.

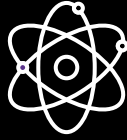
## **Co-constructed**

The program is co-constructed. Besides the overall topic and a sort of a general frame (number of hours, dates, some general topics) the content is to a large extend co-constructed by the teachers, current students, former students, and the larger entrepreneurship community in Paris. An important part of the program is the so-called “teach it yourself” slots, where we openly invite people to offer workshops on topics related to entrepreneurship where they feel that they are experts. This year, we were able to offer xx workshops on different topics like financing for start-up, using crowdfunding, finding developers and many more. These workshops were offered by some students from the current batch, some former participants of the program, start-up from our incubator Blue Factory, and others.

We are just at the beginning of the disruption of education and the future will show us many different business models. We are really interested in your opinion about OCC. In our next blog, we will go deeper into the different elements of the business model of OCC.







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*presented by*

CÉLYA GRUSON-DANIEL



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SCIENCE

## CÉLYA GRUSON-DANIEL

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*Célya Gruson-Daniel is a former neuroscience student who discovered the Web, Science and Education and then the free culture and that of the collaborative economy. At OuiShare she puts her thinking cap on to understand the changes that the Web and open culture are bringing to Science and Society. She is passionate about current transformations (open science, open access etc.) in research and she is seeking to get involved, in particular through the “Hack your PhD” community that she co-founded in 2013. She is currently the MOOCs (Massive Open Online Courses) coordinator at the Virchow-Villermé Centre (a Franco-German public health centre), whilst at the same time undertaking a PhD in the field of Information and Communication in the open science movement.*

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# MAPPING THE OPEN SCIENCE ECOSYSTEM

BY CÉLYA GRUSON-DANIEL

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*What is the place of open science in recent research? Who are the players, what products and services are they offering? Here is a first map of the landscape to understand how open science is revolutionizing science as a whole.*

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## Research today: from Science 2.0 to Open Science

Today, it seems clear that the Web (particularly Web 2.0) changes our knowledge consumption, production, and exchange. Some people even refer to a new age (the “Age of the Multitude” or the “Age of Access”). The research and academic knowledge production system are not immune to these transformations.

The Web — and more generally Information and Communication Technologies (ICTs)—enables the sharing of online scientific publications, data, and code at almost zero cost. These practices and uses are sometime called “Sciences 2.0”.

However, the opportunity to make knowledge available online for everyone highlights the privatization of knowledge based on intellectual property rights, patents, or private monopolies (e.g. pharmaceutical companies, scientific publishers).

### ***“Publish or perish”***

The research and innovation systems are part of the current knowledge economy, which is based on the transfer of knowledge and competition to obtaining funding through calls for proposals or grants. For the researchers, it leads to a publication race, the so-called “publish or perish.” Articles are indeed the main evaluation criterion. The incentive for collaborative work and knowledge sharing is thus strongly reduced.

In response, the expression ‘Open Science’ has been used more and more in recent years. This term might seem superfluous. “What is Science, if it is closed?” These two words thus point out a system where knowledge is considered as a marketable good, with a value to be captured.

### **New players**

Today, Open Science consists of a movement whose purpose is to make research more transparent, open, and collaborative. It tries also to facilitate interactions between science and society. The Open Science movement shares similar ideas with the commons (the informational and cognitive commons).

But behind this unifying term, various initiatives tend to cluster as groups depending on the services they offer or the structures they are based on (companies, non-profit organizations, collectives). In this way Science 2.0 and Open Science have led to the creation of digital companies (start-up), academic or non-academic (advocacy) and new research infrastructures. These actors and practices tend to transform the research system. They also raise new questions related to existing business models and potential new ones.

### **A first step: mapping the open science ecosystem**

The Open Science movement is strongly linked to Science 2.0 and takes the shape of a network. To get a better understanding of this movement, we deemed



it important to develop a systematic approach to assessing the interdependences and the co-evolutions of this system.

In order to do so, we completed a first map of the Open Science actors thanks to the help of an online survey and 15 contributors, we listed more than 66 initiatives from May 10 through June 14, 2014. For each, the date of creation, services offered, and associated keywords were gathered. The data supplied by the association Givewell “OpenScienceField” were also integrated. From the initial database, we created a relational database with the platform Table2Net (i.e. structure nodes-links, necessary for the structural network). The map was generated with Gephi (algorithm ForceAtlas) then clustered (algorithm Modularity). This map represents Open Science and its associated keywords.

### **How to read the map**

*(The map is displayed p.185 in the website [openmodels.fr](http://openmodels.fr))*

On this map, five clusters can be distinguished:

- › The green cluster corresponds to open access (Online and free access to scientific publications) associated with the peer-review process (evaluation by peers). Open access seems to be at the heart of the open science ecosystem. The open access movement has developed over the last ten years. Researchers were some of the first to make claims against the monopoly of scientific publishers such as Elsevier (c.f. The Cost of Knowledge) and prompted the creation of non-profit (e.g. PLOS) and for-profit (e.g. PeerJ) initiatives (in France HAL is the national open access repository) around this subject. Linked to open access, new peer-review activities are growing to modify or to complete the traditional peer review process, for example, Open Peer Review (F1000) or post Peer-Review (PubPeer).
- › The light blue cluster represents initiatives around open data in scientific research and its management. Open data extends the field of open access related to scientific publications. Open data concerns research data collection and production (raw data, figures, photos etc.), and also data storage and management.

For-profit (Figshare) as well as academic (TheDataverse Network), national (HumaNum) or international (Zenodo) platforms are dedicated to open data. The open access and open data clusters overlap with the development of specific research. On the map, we find initiatives concerning the management of these infrastructures (CCSD in France or Open Aire in Europe). These two notions will certainly be increasingly connected, together with the business models of related companies.

› The dark blue cluster is another key part of the network. It includes initiatives around bibliographical reference management, scientific social networks and also alternative metrics (Altmetrics). All these initiatives share services relating to the reputation of the researchers (research impact). The Zotero and Mendeley platforms are “traditional” referencing tools used to manage articles (authors, titles, journals, etc.) New systems such as altmetrics (Impact Story, Plum Analytics) offer other reputation criteria around articles. Scientific social networks help to connect researchers according to their field of study and interest.

› The pink cluster corresponds to new research configurations, which integrate non-professional researchers in the research process. This takes into account the societal dimension associated with open science. Citizen Science is one of first representative links relating to the interactions between Science and Society. Responsible research emphasizes interaction with social entrepreneurs. Also present in this cluster are new research spaces such as bio hackerspaces or open labs. Open notebooks and protocol-sharing platforms underpin a more open and transparent research process (Ipython Notebook, protocol exchange).

› The yellow cluster includes initiatives related to open science (Force 11) and open access (SPARC) topics and to research in general.

### **This is only the start!**

This map is a first research work which itself borrows an Open Science approach. With this article, we want to show the “research in process”, so comments and critiques are welcome to subsequently help refine the work.



Your comments and suggestions on this map or the survey will help to add new initiatives and improve this research project. This first step as part as a PhD project will be cross referenced with other methods and data to give a more precise overview of this ecosystem, its dynamics, and its impact on the current research system.

— *Thanks to Franck Ghitalla for the creation of the map  
and to Pascal Jollivet-Courtois for his help with the data analysis  
and his precious proofreading.*  
— *Translation by Matthieu Le Chanjour with the help of Andi Argast*



# “KNOWING HOW TO MANAGE BIG DATA”

INTERVIEW WITH **JULIEN THÉRIER** (SHAZINO)

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*Shazino is a start-up developing innovative applications to improve knowledge sharing and collaboration between scientists. Shazino is part of the “Science 2.0” wave and Julien, its founder, explains here how the freemium model allowed him to address a large audience, while at the same time still generating revenue.*

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## **What is Shazino’s business model?**

Shazino offers various applications. Three are free and designed for biotechnologies (colony counter, a plasmids manager and a laboratory “timer”) and two other applications which generate most of our income. We took a chance on the first three apps to get traction which allowed us to then communicate on Papership and Hivebench. Both apps use the freemium model, meaning that part of the functionalities are free of charge. Papership is an iPhone / iPad app which can be added to a free reference management tool such as Zotero and Mendeley. For example, it facilitates the exchange of articles via SMS or email which are not open access without breaking the law. Papership helps scientists organize their articles, and makes them aware that they can’t do things like sharing them through a site without having the rights to do so. It is a way for us to change these barriers.

With Hivebench, our goal is to highlight open science. The platform is an online laboratory notebook. The open science version is free of charge and



everything takes place online, in the cloud. In an informal way, we push the users to open their research online for the benefit of other communities. For that purpose, HiveBench is connected to other open science platforms such as Figshare, PeerJ, ELife and F1000. We also created an open protocols database. If users wish to install Hivebench on their own server and add intellectual property, then they have to pay, and this mostly concerns laboratories and universities. The fee charged is compensated by the fact the system is closed and not accessible to the outside world.

### **What are the limits to openness?**

For me, we cannot make open science if we don't endorse this approach ourselves. It is a question of ethics. So we decided to share a part of our projects in open source. Unfortunately without having much benefit in return because researchers do not easily understand this concept. In my opinion this situation leads to deviations, such as the scientific social network ResearchGate. Their model is closed but it advocates on the other hand for article sharing between scientists. In open source communities this situation would be impossible. But researchers often only look for a website's design and its user experience without really considering the ethics or lack of that is behind it.

### **And why is only a part of the code open source?**

As we address communities which are not sensitive to this open source approach, if we opened everything, some companies might take the code without giving anything in return. I see open science just like the situation open source was 20 years ago. The leading actors in the research market, like publishers, are wondering about this model and do not really fully understand it. They see too much risk in it. They prefer to opt for open innovation. Meaning they create a consortium from 4 to 5 big actors, each of them collaborating in a specific section of the value chain.

***“If we opened everything,  
some companies might  
take the code without  
giving anything in return.”***

### **In your view, what are the challenges that Open Science faces?**

In Shazino’s core markets biology and biotechnologies, numerous start-ups have developed themselves using the open science model, these include Figshare, Authorea etc... Here, big data and its management is at stake. Scientific publishers, such as Elsevier Nature Publishing group understood these stakes as well. They have started to buy start-ups and/or are creating partnerships. In my view, we will not disrupt these big publishers. On the other hand, the change will be that the business model of open science will not rely on paywalls but on data management. For open science, a major issue is rewarding researchers for these new sharing practices. Today, “open” work is not credited. The researcher is not sufficiently incentivized. We see for example that postdocs are the ones who actually share the least. Why? Because being a postdoc implies greater competition on the job market. Sharing your own data is not a criterion of evaluation in this selection.

### **Is there still reason for hope?**

Yes, European financing projects such as the Horizon 2020 in favor of open access and open data are a step in the right direction!

— *Interview by Celya Gruson-Daniel*

— *Translation by Matthieu Le Chanjour with the help  
of Antoine Martin-Regniault*



# “SOSCIENCE IS SERVING SOCIAL ENTREPRENEURS”

INTERVIEW WITH **MÉLANIE MARCEL** (SOSCIENCE)

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*Co-founder of SoScience, a start-up which promotes responsible research while favoring high level scientific technological development for social entrepreneurs, Mélanie Marcel believes that before looking at profitability, it is necessary to first convince that open science is useful to society.*

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## **What does SoScience offer?**

SoScience is delivering high-level scientific research with a strong social and environmental impact. We're setting up research projects with international social entrepreneurs and French engineering schools. SoScience is striving to develop technologies adapted in the laboratory.

## **What is the business model?**

Since February 2014, SoScience has operated under a SARL model (company with limited responsibility). The first ideas around this project started at the end 2011 and I've been working full-time on it with Eloïse Szmatala, my co-founder, since September 2013. So we're two managers and we're functioning in the start-up bootstrapping mode. For the moment, we've decided not to remunerate ourselves and so we're not looking for investors.

## **What services does SoScience provide?**

SoScience offers different services. We're setting up research projects for social entrepreneurs with some labs in order to come up with a final product. The entrepreneur pays according to their financial capacity – knowing that the price of our services is far below the cost of traditional R&D expert advice. Funding must not be an obstacle for social entrepreneurs, but because of this aspect, this service is not profitable.

## **How could it become profitable?**

We're offering two more services, which have become our sources of income. First, we're setting up paid training programs with engineering schools for students including courses, conferences and workshops. We're also offering training programs to big companies looking for our know-how to facilitate in-house innovations. Second, we've created expert advice and consulting offers for companies wishing to develop their research more responsibly.

## **Have you thought about other sources of funding?**

We don't exclude any new funding sources. But for the moment, we're not looking for investors. We're still "small" and we want to keep our freedom and horizons open. Concerning calls for projects, we're interested in European projects H2020, a funding source related to responsible research and innovation.

## **What is the link between your responsible research missions and open science?**

Our mission is directed specifically to social entrepreneurs. We're adapting by following their decisions in terms of intellectual property, which can be patented for example. However, we insisted in having shared patents with all stakeholders – which will increasingly become part of the long-term revenue



for SoScience. Some of them are 100% open, and in these cases, the lab's copybooks and research results are available online and there is no patent on the technologies. This is the case for Cesar Harada's Protei project, founder of Open H2O group, offering to remove ocean pollution using open source drones.

Some other projects offer open source software, but the product (hardware) is closed. These choices are linked to the beliefs of entrepreneurs and the business models they have chosen to put in place. For me, a strong link with open science refers to accessibility in that entrepreneurs want to make their technology available for the greatest number. This results in projects that can be put in place by people themselves. We're following a project of do it yourself solar ovens in Argentina, SolarInti. This open hardware policy is very important to restoring the confidence of population. Similarly, in medicine, accessibility is synonymous with low product costs. For example, UNITAID association is thinking about giving access to HIV treatment at a very low cost, even if the research linked to this objective are not, themselves, in open science.

**Does open science also include the plan to open research in other areas of study? Does this align with SoScience's values and goals?**

Yes, absolutely! We come from the world of academic research and are very attached to it. We're acting as interpreters. We make researchers and students understand they have high scientific skills, but that entrepreneurs also have a better understanding of the field. It is often a meeting of two worlds which have a lot of problems communicating with each other. Our role is to carry out this work of translation and intermediation.

— *Interview by Célya Gruson-Daniel*

— *Translation by Anne-Sophie Payen with the help of Caitlyn Hutchison*

# “OPEN SCIENCE ENCOURAGES REBELS AND CREATIVES”

INTERVIEW WITH **ALLAIN RALLET** (RITM LABORATORY)

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*Allain Rallet is an economist at the RITM (Réseau Innovation Territoire Mondialisation – Network Innovation Region Globalization) laboratory in Paris Saclay. He brings a new perspective on the knowledge economy and on digital technology's impact on research. Using crowdfunding as an example, he shows that digital transformations are not only occurring at the financing level, but that in particular it is the emergence of innovative organisations able to foster creativity that is at stake.*

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**What are the commonalities between new business models developed with digital technologies and those based on research?**

Digital technology offers the possibility of witnessing the emergence of other business models involving new ways of producing and distributing services and products. Take cultural industries for instance, the economy is based on stars and bestsellers that reap most of the benefits today. Other artists can often hardly earn a living as writers, producers or musicians. With crowdfunding, artists look for funding that the industry cannot provide. Although they are talented, they do not fit the required standards. Crowdfunding allows the development of an ecosystem and also an audience



where funders are also subscribers and broadcasters. These micro-communities provide support for authors and artists who can meet their audience and earn their living with a new source of income. Digital technologies make those opportunities possible but don't guarantee them.

We can also apply this model to research, which is increasingly formatted by "publish or perish" rules. This is a major concern for creativity and innovation.

Can digital technologies enable other production, publishing, distribution and validation of knowledge? This is a major question that concerns all fields of activity, but also research. Open science and all its variations (open knowledge, open research) could provoke the emergence of other kinds of organizations based on collaborative practices. Today, although it is inherent in science, the collaborative and cooperative characteristics of scientific production are jeopardized by the privatization of knowledge.

### **How do the new models relate to the existing, dominant ones? Have they developed as competitors or as additional models?**

As with crowdfunding in the cultural industry, we can ask ourselves if these models are an alternative organization which will become a substitute for the existing one? Could we imagine a system without public subsidies, for example? In the field of research, subsidies are justified by the fact that science produces externalities. With only free market, we would have an underinvestment. Indeed, investors do not have any certainty of recovering all the value-added effects produced by knowledge.

Public subsidies are thus necessary even though nowadays they are linked to trade deals, which are in reality management and transfer of knowledge for private companies. This is the case, for instance, with a large number of scientific publishers. Open science raises an essential question in terms of strategy. If it becomes mainstream, it is necessary to support the guarantees of its emergence. By trying to substitute open science for the actual system, the risk would be to suffocate this initiative.



***“The collaborative  
and cooperative characteristics  
of scientific production  
are jeopardized by the  
privatization of knowledge.”***

**Could we finance research with crowdfunding instead of public subsidies?**

In terms of subsidies, I think that today the answer is no. On the other hand, crowdfunding can fund research fields that today encounter difficulties because of the financial norms at the national and European level. Furthermore, crowdfunding can also be considered as a way to organize and to strengthen scientific communities. They already exist but are in the hands of associations that ensure the application of standards and rules. Communities could act in a more informal, self-organized ways at the level of knowledge publications as well as the peer-review process. Behind all this, there is a strategic issue that arises, and is common to all fields of activity (i.e. business, health, education) namely, under which conditions will these technological opportunities help to develop innovative organizations?

**What are the challenges behind these innovative organizations based on open science?**

These initiatives can provide more diversity in knowledge. The pioneers in the field of science are not the ones who repeat the same task. Yet today, if we throw away 70% of articles published, knowledge of humanity would not decrease. Research today doesn't mean creativity.

Open science would be a way to encourage dissidents, creative people, new ideas or methodological contributions. We know that the history of science is related to the rebels, the people on the fringes who put knowledge forward.



Interdisciplinary research is a good example. French and European funding supports interdisciplinary projects. But when considering evaluation, the framework remains disciplinary, which is to the disadvantage of researchers. Could these new modes of organization create new spaces for interdisciplinary work? The current situation would be opened up thanks to new incentives for publication and evaluation.

It is of course important to be cautious regarding crowdfunding that only funds projects that support dominant opinions. These new models encourage “out of the box” bold research, even if they do not guarantee full funding. It is a good way to stimulate creativity in the field of science.

— *Interview by Célya Gruson-Daniel*

— *Translation by Matthieu Le Chanjour with the help of Andi Argast*

# TROUBLES IN UTOPIA: HOW OPEN ACCESS HAS BEEN LOCKED DOWN (AND HOW THIS CAN CHANGE)

BY PIERRE-CARL LANGLAIS

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*Pierre-Carl Langlais acknowledges himself as a “wikipedian”. As such, he is well placed to distinguish between commodified scientific data and contributions to knowledge commons. According to this open access activist, commercial scientific journals are interfering with free knowledge, but new horizontal structures based on peer-to-peer relations are also reaching an unprecedented scale. This gives us reason to be optimistic.*

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The open access movement was born from an exclamation: “Open access! Let's free knowledge! All knowledge! Now!”. It was a spontaneous appeal stirred by a deep paradox: while most people in academia (let alone the general public) can less and less afford to have access to original research (with single electronic articles reaching the price of several books), production expenses have decreased at an unprecedented rate. By switching to all-electronic distribution, publishers' activities are approaching zero-marginal cost: formatting, evaluating and distributing publications are mostly delegated to researchers or processed by algorithms.

And then Utopia sprung up. This grand idea that researchers could immediately publish the result of their investigations and be read, with no additional cost, not only by their peers, but by everyone.



This utopia has not vanished, but everything has become more complicated. While the technical possibility of universal free access should have freed researchers from the external control of publishing industries, we have witnessed quite the reverse trend. The main players in the field, Elsevier, Springer or Wiley, are more powerful than ever and remain wholly undisturbed by the possibility of switching to an open access economy. Calls for a wider reform than the mere free distribution of research have increased over the last few years, within a wider reflection on the advent of knowledge commons in the digital age.

### **Displacing the value extraction**

The conversion to open access has accelerated a pre-existing progression where leading scientific publishers are gradually being transformed into cultural industries. They do not sell journals anymore (in the way that journals would be a “commodity” with an autonomous value), they trade with fetishes.

The objective value of a publication and its productions costs has been replaced by the subjective value of its social reputation. If the electronic journals that cost less and less are getting sold at higher and higher prices, that is because they represent something else: an evaluation index. Back in the 1960s, Eugene Garfield initiated a precursor to Google for scientists, the Science index, where every journal was rated according the extent to which it was quoted elsewhere. This early implementation of the PageRank system is called the “impact factor”. For half a century, scientific communities have been progressively locked into a “culture of citation”, whereas career advancement depends greatly on the ability to get published in the right journal.

By holding a sizable chunk of qualified journals, a publisher like Elsevier generates lasting, powerful revenue. Researchers are paid to write in the “good” journals, they frequently pay (themselves or via their institutions) to be published in the most prestigious ventures, while public libraries are buying back these very same publications. With such a multi-layered source of income, scientific publishing turns out to be an immensely profitable industry. Elsevier’s profits are close to 40% of its revenue and most

of its main competitors achieve comparable margins (reaching 45% for Taylor and Francis).

The conversion to open access seems unlikely to threaten this profitable business. Facing a possible loss of subscriptions, publishers have put additional emphasis on “Article processing charges” – the *gold* model for open access. Researchers are buying rights to publish, so that the article can be distributed free of charge (usually under a free license, such as CC-BY). In such an inelastic market, nothing can really stop publishers from fixing higher and higher prices. A right to publish is merely a reflection of the “prestigious value” of the journal, that has been firmly locked up by the emergence of the vicious circle of the “impact factor”. The more a journal is quoted, the more easily it will draw contributions from stellar scientists.

## **An industry of data**

Scientific journals have not completely morphed into a superfluous manifestation of symbolic value extraction. While, in a gold open access model, articles are unlikely to be sold as piece of written knowledge, they can be cut up into a set of data.

Scientific text mining is a very promising field of activity. The digitization of academic corpora on a massive scale has made them available to a new class of readers, namely algorithms. Text mining tools and scripts are able to identify the synthesize a whole corpus of literature generated by a discipline or a preeminent field. In just a few years, the Text2Genome project has therefore been able to

***The objective value of a publication  
has been replaced by the subjective value  
of its social reputation.***



## *This represents the definite move from a data industry to a metadata industry*

map the collective knowledge of 3 million articles in genomics, by indexing all the relevant information linked to the genes or DNA sequences. Concretely, this results in significant time gains. A human research team could have come to a similar result, but probably after more than a century of close reading.

The publishing industries are keen on capturing the value of what could become a thriving activity in the near future. In 2013, Elsevier and Springer undertook significant lobbying campaign at the European Commission to enforce contractual licenses, that is a standardized technical and legal framework through which “distant readers” could access their textual data. The Terms of Use enacted by Elsevier in January 2014 are akin to a privatization of intellectual property law. Contrary to usual provisions against the private holding of mere “facts” and “ideas”, Elsevier restrains every commercial use of the “outputs” of the text mining project and obliges every user to adopt an Application Programming Interface (API) burdened with restrictions (no more than 200 characters, when some genomic or chemical names have many more).

Finally, all the projects willing to mine data have to register. This represents the definite move from a data industry to a metadata industry. With its API, Elsevier can record all queries and connect them to what it knows about the user. All these inputs can contribute to the elaboration of a considerable dashboard of worldwide research and can be cross-referenced with numerous other relevant metrics (such as statistics on article views in Scopus, the Elsevier database for distributing articles).

The ability to track most of the online activities of researchers is much sought-after by new stakeholders. The business model of academic social networks

is based on the parallel extraction of bibliographic information (by storing articles) and personally identifiable information (user metadata, interactions). Like Facebook or Twitter, these specialized networks aim to exploit all these datasets for marketing purposes. Furthermore, they try to play a significant part in the redefinition of metrics and evaluation tools. Researchgate has for instance developed premium services to increase the notoriety and the “quotability” of its users. The underlying objective would be to establish a “locked” system comparable to the impact factor, that would firmly establish them as key players in order to guarantee a profitable academic career.

### **Beyond free use: research as a commons**

While all these new ventures claim to promote open science, openness is nothing more than a selling argument. The forceful call for an enhanced access to publications conceals a wide number of emerging enclosures on parts of scientific knowledge, the reuse of which was never restricted before. These include databases, textual data, bibliographies and metadata.

Yet, the intensification of the commodification of knowledge has inspired unprecedented actions. Spontaneous movements like *The Cost of Knowledge* have proven their ability to federate thousands of international researchers against the oligopolistic power of leading publishers. Recently, a Kazakhstan-based Russian scientist created the largest scientific library in the world, Sci-hub, a massive collection of 50 million articles, which were illegally gathered. Sci-hub currently faces a tense trial against Elsevier. It is unlikely to win the case, but it is also unlikely to be actually shut down given its remote location.

And so a - not so utopian - thought arose: to harness the power of digital tools in order to create knowledge commons, that would be managed in a similar way to the collectively-owned forests of the medieval commoners. The social efficiency of algorithms may well serve the interest of hierarchical companies, but it can also ensure the development of autonomous communities on an industrial scale. Wikipedia shows an inspiring example of “communification” of knowledge. While it was initially conceived as the small fork a commercial encyclopedia,

Nupedia, it gradually outdistanced all its leading competitors and, in the end, transformed the billion-dollar encyclopedia market into a commons. Scientific publications are already partly a common. The writing or evaluation of articles are not commodities given that researchers are often not explicitly paid for these activities. Yet, it is a trapped common: in the end, all these non-commodified activities will only enrich the capital of publishers.

The emerging potential for data management or text mining could serve as a strong motive for a deep reorganization of the way we publish science. Elsevier or Springer have, so far, failed to develop efficient infrastructures to link up the multifaceted productions of contemporary scientific writing (database, code, data visualization) and connect this output to the wider web of semantic knowledge. New community-driven projects (such as the Wikipedia of data, Wikidata, or the Self-Journal of Science) and public-funded projects (such as OpenAire in Europe) currently seem much more capable to respond to these emerging challenges and combine them with innovative processes to evaluate research (such as open peer review).

Ultimately, the achievement of Utopia rests on scientific communities and their ability to address changes beyond the inherited reflexes of their textual culture, and to promote effective reforms on a political level. Since 2012, the mobilization of researchers has directly contributed to the development of open access laws and text mining exceptions in several European countries. A constant, day-to-day mobilization is now necessary to transform science into a thriving, lasting common.

—*Translation by Pierre-Carl Langlais with the help of Corine Waroquiers*







# LICENSES AND BUSINESS MODEL

INTERVIEW WITH **BENJAMIN JEAN** (INNO<sup>3</sup>)

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*Benjamin Jean is a well-known lawyer in the world of open source, open data and more generally within open models. President of the company inno3, Benjamin is also a consultant within Gilles Vercken's firm, senior lecturer at Sciences Po, and highly involved within the community ecosystem (co-founder of the European Open Source and Free Software Law Event [EOLE] and of Veni Vidi Libri, administrator of Framasoft and "Libre Accès" and president of the Company of Acceptance and Allocation of Donations [SARD]).*

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**There are many open licenses (open source, open data, etc.), but they differ depending on sectors or contexts where they are used. How do you not get confused?**

Open licenses appeared in the mid 80's, when copyright was adapted and extended to software. Open license usage characterizes a way for the author to ensure his rights. They essentially deal with copyright, but these licenses were adapted to fit broader issues of intellectual property rights.

There are more than 70 open source licenses certified by the open source initiative. In practice, we can count several hundred of them and not all of them are actually certified. Moreover, authors can modify these licenses (so several versions of the same license coexist), and users can also choose to adapt these licenses to their specific needs.

With this in mind, the first two big external projects (Linux and Perl) which utilized the GNU GPL (General Public License) prepared by the Free Software Foundation, did so by modifying it. There was certainly an idea of reappropriation in doing so, but what was clear above all else, was the evidence of great variety and heterogeneity of the emerging ecosystem.

License creation rates have greatly accelerated since 1998, when Mozilla wrote its own license to open its code. It was at this time that the industrial field realized the potential of open source. Unfortunately, the Mozilla Public License (MPL) initiated a wave of proliferation of licenses because it was written so that it could not be used in its current form. Big companies like IBM, SUN or Alcatel then prepared building their own open licenses on MPL.

Now, this kind of multiplication not encouraged within the community because of the incompatibility generated by this proliferation (the combination of several components is impossible because of their respective licenses). IBM was the first to give up old licenses to give preference to common and interoperable licenses.

### **What is the success factor of a given open license?**

The success of a license is linked to its intrinsic qualities, but also to multiple external factors (the industrial or community “supporters”, the language, leading projects, etc.). In this respect, in the cultural goods sector, when Creative Commons licenses appeared in 2001, they weren’t the first to be interested in digital creations. It was because of communication and generalization efforts that users adopted them and made them the standard (at the expense of most of pre-existing licenses which disappeared).

In so-called open source licenses, we can distinguish two classes: copyleft licenses and “permissive” ones. Within a copyleft license, contributions and modifications must be inserted under the same license. Permissive licenses, like BSD or Apache, allow the distribution of the final creation

or of collaboration under any other license, as long as certain and generally unrestrictive obligations are respected (for example, at minimum keep the license text and indicate the name of author).

### **“Traditional” commercial companies are using more and more open licenses to distribute their production. What motivations do they have to do this?**

In some cases, companies are compelled to do so because they use bricks or developments that are created under licenses that impose this kind of distribution model (copyleft licenses already referred to).

In other cases, they do it for reasons that are related to practicality and efficiency. The equation is simple. It is in their interest to rely on something that pre-exists and is used by a large community because they are not the ones who have to take a big risk to reap the benefits. The value of the final product also comes from other factors such as know-how, knowledge, combination, but also from the company brand or services it associates with.

In any case, these companies are more focused on leveraging opportunity and minimizing risk than voicing ideological beliefs. Licenses are tools used to gain a result. And yet we still notice that these kinds of open approaches can have consequences far beyond R&D, initiating a cultural change by generalizing collaboration, not only with regard to its partners but also to its employees.

### **What is the link between licenses and business models?**

There are a lot of links. The first justification is directly intrinsic to intellectual property, as the main purpose of these licenses. Intellectual property rights sit at the crossroads of law and economics, and are one of the most important assets of our economy – and I would add human capital to this as well. It's no surprise that the management of this intellectual property through open and open source licenses will have major consequences for organizations which decide to use them.

Next, the license gives a framework detailing the rights and duties of the stakeholders for a one-off or repeat collaboration. Licenses establish what each contributor can do with the common creation. It is in this way that they create a framework to ensure sustainability and collaboration (with the rights being managed).

The license presents the shared rights – in principle, everything that is not expressly shared and retained – and conditions associated with its use, with transparency. Some business models are impossible to build and maintain in the absence of specific rights. It is only the holders of initial rights who can define their business strategy with the least limitations but even these are being compelled to think in terms of the creation and production chain (the license used on their component will impact the reuse of the latter). For example, the RedHat company cannot use dual licensing (that is to alternatively offer a business license) because the licenses of components they use impose an open source distribution. *A contrario*, some companies select their components strictly to ensure such a freedom.

We can then say that licenses follow the business model as much as they determine it. This is why some projects start under business licenses and begin to develop under open licenses.

### **What are possible practices within contributive projects as hackathons? And what about collective projects conducted within fablabs?**

For some time, I worked on ideas carried out on this topic by NUMA, a Parisian space dedicated to the digital stratosphere. The objective was to define a legal framework which reassured each stakeholder about the use of results at the end of an event. This requires the preparation of certain agreements between multiple actors.

More recently, we had the opportunity to work together with the members of *l'Équipe* who wanted to organize a hackathon. This enabled us to define some “well-balanced” rules by participants and organizers alike. If some were continuing their project they had to do it with consent of the

organizers. The agreement also stipulated that from the second day, when projects were beginning to materialize, teams had to meet to choose an open license to apply to their creation.

The idea was not to take their rights away but, on the contrary, to inform them and especially to explain that, by default, co-creation status is the most complicated legal status that exists. This is because joint creation becomes common co-ownership for all contributors, which means that nothing can be done without everyone's consent. Gathering all co-authors and agreeing on a common operation framework is very complicated *a posteriori*, if not impossible.

Some work remains to be done to help optimize understanding and acceptance by everyone. But this first and foremost involves a strong sense of trust. This is the basis for discussion. The main objective of a license is to build trust in order to encourage contribution. Licenses themselves also often operate on the basis of trust. This is why the choice of the license must be thought through (the use of an exotic license will raise suspicions) and is also what explains that potential contributors will have far more confidence in a license prepared by the FSF (Free Software Foundation) than in a license prepared by a company which also publishes commercial software competing with the main open source projects (Microsoft especially, but this applies to many other companies).

— *Interview by Karine Durand-Garçon*

— *Translation by Anne-Sophie Payen with the help of Caitlyn Hutchison*

# 14 PROPOSALS FOR AN OPEN ECONOMY

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- 1 DEVELOP NEW LICENSES IN LINE WITH PEER PRODUCTION & RECIPROCITY LICENCES  
.....
- 2 DEVELOP A TOOL/PLATFORM OFFERING AN OVERVIEW OF ALL EXISTING LICENCES  
.....
- 3 DEVELOP PLATFORMS AND NETWORKS WITHIN LOCAL AUTHORITIES  
.....
- 4 PROMOTE OPEN SOURCE LICENSES IN PUBLIC PROCUREMENT  
.....
- 5 IDENTIFY STAKEHOLDERS WILLING TO WELCOME OPEN INITIATIVES  
.....
- 6 DEVELOP KEY INDICATORS THAT PLACE VALUE ON CONTRIBUTIONS TO “OPEN” PROJECTS  
.....
- 7 MATCH CROWDFUNDING CAMPAIGNS WITH PUBLIC FUNDING  
.....
- 8 LINK PUBLIC UNIVERSITY FUNDING TO THE NUMBER OF OPEN SOURCE  
AND OPEN ACCESS PROJECTS DEVELOPED  
.....
- 9 CREATE AN INDIVIDUAL RIGHT TO CONTRIBUTION  
.....
- 10 CREATE THE “1%OPEN” FUND TO FINANCE EMERGING OPEN PROJECTS  
.....
- 11 VALUE OPEN RESOURCES IN COMPANY BALANCE SHEETS  
.....
- 12 CREATE A COMPANY RANKING PROMOTING INVOLVEMENT  
IN OPEN APPROACHES  
.....
- 13 INFORM ABOUT THE ECONOMIC EFFICIENCY OF OPEN APPROACHES AND PRACTICES  
.....
- 14 DEMONSTRATE THE POSITIVE EXTERNALITIES GENERATED BY OPEN APPROACHES



## Explain existing licenses and creating new ones

Open models are developing new approaches to intellectual property and copyright. Existing licenses are not all well-known and understood, and some are also difficult to implement. Another concern is that they do not always allow opening with reciprocal terms and conditions.

**Proposal 1:** Develop new licenses in line with *peer production & reciprocity licences*.

**Proposal 2:** Develop a tool/platform offering an overview of all existing licences and patents.

## Involve public authorities

The State, communities and governments can play a key role to support the development of open approaches. Firstly, as a consumer of goods and services itself, the State may choose to favor those that are produced in an open way. Also, it may influence the criteria used by financing bodies for project selection and qualification. And finally, it may support these initiatives financially. Furthermore, as is already the case today with the *Etalab* open data approach, the State may drive an internal transformation of its own to undertake its activities using more open practices.

**Proposal 3:** As a priority, develop platforms and networks within local authorities, steered independently from the central administration.

**Proposal 4:** organize public tenders in such a way as to promote open source licenses (code, design, content) and not only digital aspects. More drastically, make open source a mandatory criteria; or, in a less radical way, raise the open share to at least 30% of the project valuation. Similarly, include an open data section in each public tender, to at least allow project management transparency (open data ensures fair access to public markets and fosters innovation).

**Proposal 5:** Identify stakeholders in administrations and communities willing to welcome open initiatives.

**Proposal 6:** Develop key indicators that place value on contributions to “open” projects (as opposed to indicators related to the number of patents or scientific papers published).

**Proposal 7:** Systematically match all crowdfunding campaigns meeting certain criteria with equal public funding.

### **Foster and promote contributions to open projects by individuals and organizations**

Individuals, companies and universities are the drivers behind the development of open initiatives. However, administrative or economic constraints may hinder contributions to open initiatives, while existing incentive mechanisms penalize them all too often.

**Proposal 8:** Link all - or part - of public university funding to the number of open source and open access projects developed (ANR financing).

**Proposal 9:** Create an IRC (Individual Right to Contribution), based on the model of the IRT (Individual Right to Training), to allow employees to spend time contributing to open projects.

**Proposal 10:** Create a fund entirely dedicated to open projects based on a business contribution (the “1% open” contribution) that could match funding (on a one-to-one basis) for open projects demonstrating a true benefit for the community. Along these lines, how about creating a fund at the European level?

**Proposal 11:** Allow the valuation of open resources in company balance sheets (in the same manner as associations can include the value of voluntary work in their own balance sheets).

## **Expose the purpose and impact of open models**

The benefits of open models are sometimes unrecognized. Popularizing them, demonstrating their positive externalities, and promoting public knowledge about open strategies can help to close this gap.

**Proposal 12:** Highlight the value of contributions to open approaches, based on the same model as Corporate Social Responsibility (CSR). Create a company ranking promoting involvement in open approaches.

**Proposal 13:** Inform companies and large funding bodies about the economic efficiency of open approaches and practices, and share advice on methods to implement them.

**Proposal 14:** Demonstrate the positive externalities generated by open approaches by means of a research study (ANR).

*— These proposals were put together in June 2014 during a workshop organised by Without Model, as part of Lemoine mission on the digital transition, attended by about fifteen experts including some contributors of this publication.  
— Translation by Jérôme Mizeret with the help of Corine Waroquiers*



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He co-founded Without Model in 2012. He is now a researcher in strategy at the ICD Business School and ESCP Europe, and a contributor to many

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# thanks

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# OPEN MODELS

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## BUSINESS MODELS OF THE OPEN ECONOMY

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OPENNESS IS GAINING GROUND EVERYWHERE. AT FIRST IT WAS USED BY A SMALL PASSIONATE COMMUNITY, BUT NOW THE FULL FORCE OF THE OPEN PHILOSOPHY IS IMPACTING THE “TRADITIONAL” ECONOMY. IN EVERY AREA, FROM INDUSTRY, EDUCATION, CULTURE, AND SCIENCE TO OF COURSE INFORMATION AND DATA, WE ARE SEEING OPENING OF DATA, KNOWLEDGE, AND TRADE SECRETS. WHY?

BECAUSE A NEW WAVE OF COLLABORATION IS CRASHING OVER THE WORLD, BUT ALSO IN PARTICULAR BECAUSE THE OLD CLOSED, VERTICAL MODELS HAVE SHOWN THAT THEY ARE POWERLESS IN AN ECONOMY SHAKEN UP BY THE INTERNET AND TECHNOLOGY.

THIS BOOK PRESENTS A FIRST OVERVIEW OF THIS MAJOR SOCIETAL CHANGE. IT DECRYPTS THE MOST EVIDENT EFFECTS OF THIS SUBSTANTIAL PARADIGM SHIFT.

WITH THE HELP OF DOZENS OF EXPERTS AND PRACTITIONERS, THIS BOOK SEEKS TO MAKE THE NEW OPEN BUSINESS MODELS VISIBLE IN A PRACTICAL WAY. IN IT INFORMED READERS AND NOVICES ALIKE WILL FIND ANSWERS TO THEIR QUESTIONS, ALBEIT ONLY “SOME” ANSWERS, NOT “ALL” THE ANSWERS AS WE HAVE NOT YET CALCULATED THE FINAL IMPACT OF THIS OPEN WAVE.



*In collaboration with*  
**Usbek & Rica**