

Understand **OPEN SOURCE-MANUFACTURING** in 30 minutes

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As part of the REMODEL programme, we have curated a collection of articles and video which help you understand open source and some of the ways it can be applied within a manufacturing context.

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In collaboration with a range of national and international partners, Danish Design Centre has launched the REMODEL programme, which explores the potential of using open source principles in business models for manufacturing. The term 'open source' originates from the software industry, but has since had an impact on many other industries, and is part of the huge digitization wave we are in the middle of as a result of new, disruptive technology.

For a business to be able to discuss strategic perspectives of new technology it is important to be able to stay fully informed in new developments of the digital landscape. Nevertheless it can be hard to find the required time to keep oneself up to date, especially as a director or decision maker of a busy company. This is why we, as a part of REMODEL, have created this reading/viewing package which can be consumed in half an hour and will allow you to understand open source, along with the potentials the concept has for your business.

We start off with a short video from Danish company Socialsquare, which explains the meaning of open source and how it works in practice in five minutes using LEGO

bricks: “What is open source explained in LEGO”



What is open source explained in LEGO

Let's now have a look at how these ideas can be applied in a business context. In the article [‘Why content sharing might just be good for business’](#), American lawyer Sarah Hinchliff Pearson explains how the internet opens up for possibilities for creating completely new connections to clients and potential co-creators, and how new perspectives on copyright allows for new ways of doing business. The article is primarily concerned with digital content, but a lot of the points are valid when it comes to physical products as well.

The next resource is an article by Canadian Paul Stacy, one of Sarah's colleagues, and with whom she is currently working on a book on the subject. In the article [‘What is an open business model and how can you generate revenue’](#), he deals with an essential aspect of applying the open source concept in business: It requires a business model which ensures that openness is an integral part of your business and that it is clear how the interaction will be

beneficial to both your clients (co-creators) and your company.

This innovative approach is furthermore discussed by British Charles Leadbeater in his TED-talk 'The era of open innovation':



Charles Leadbeater: The era of open innovation

Leadbeater points out how innovation rarely occurs within companies behind closed doors, but rather in society in general through collaboration and co-creation. This is called open innovation and is often a precursor to open source-driven business models. Not just for software and virtual products, but increasingly for physical products too. This development is in large part driven by new digital manufacturing technologies such as additive manufacturing (3D printing), robotics and artificial intelligence.

This development puts the open source concept into a business context and points towards the technology-driven manufacturing of the future. With the concept of the 'Zero

Marginal Cost Society' (and a great book by the same name), American author Jeremy Rifkin explains exactly what this development means for all companies, especially concerning manufacturing:



Jeremy Rifkin: Zero Marginal Cost Society

Currents within the field of open source business

We are starting to see some emerging patterns across the many open source-based business models appearing around the world. French researcher and author Louis David Benyayer has written about this and has identified these main categories by mapping out hundreds of business models:

- Platform: The company creates a platform that allows clients and contributors to interact and create open source products, and thereby create value for themselves. The company can select the best contributions and commercialise these. Example: Furniture company [OpenDesk](#).
- Hybrid: The company creates an open source product, to which the public has free access. While

the company doesn't earn money directly, they create the opportunity to earn money from additional products and services. Example: Tech-giant [Google](#).

- Dual: In the dual models, the company uses different licenses for different purposes. In other words, the licenses specify how their open products can be used in various contexts. This might mean that the customer is allowed to use the products for free for non-commercial purposes, but that commercial use costs money. Example: Cardgame producer [Cards Against Humanity](#).
- Contributory: With this approach, a community of co-creators surrounds the product, and the company's research and development is placed externally in such a way that the community is where updates or brand new products for the company are developed, while also allowing the company to use the ideas and content created. Example: The software system [Linux](#).

Louis David Benyayer has written a very relevant book by the title Open Models, which contains multiple examples and case studies. [Buy the book here](#).

Exciting international cases

When it comes to examples, Denmark does not have a lot of companies that has distinguished themselves by their use of open source business models for manufacturing - yet. But there are many interesting examples across the rest of the world worth taking note of:

- Open Desk (England): [Read more about Open Desk's model](#).
- Arduino (Italien): [Read more about Arduino's model](#).
- Tesla (USA): [Read more about Tesla's model](#).
- River Simple (UK): [Read more about River Simple's model](#).
- Local Motors (USA): [Read more about Local Motors' model](#).

Read more:

Learn more about the topic

There are many opportunities if you want to explore the concept of open source further. We've collected an extended list of resources here:

- The IO best TED-talks about [‘Open source, open world’](#) and especially [‘The New Open Source Economics’](#) by Israeli author and Harvard professor Yochai Benkler.
- The video series [‘Open Source Business Models for Circular Economy’](#), created by Lars Zimmermann and Open It Agency in Berlin, who is a REMODEL-collaborator.
- The book [‘The Zero Marginal Cost Society: The Internet of Things, the Rise of the Collaborative Commons, and the Eclipse of Capitalism’](#) by Jeremy Rifkin, as well as [this article](#), which sums up the main points and [this interview with Rifkin from the BBC program Hardtalk](#).
- Yet another book: [‘Open Models: Business Models of the Open Economy’](#) by Louis David Benyayer. The book can be bought as a paperback or read for free online.
- Follow the open source business expert [Gil Yehuda on the social platform Quora](#), where he answers questions from all over the world.
- The book [‘Open Design Now: Why Design Cannot Remain Exclusive’](#) by Bas van Abel, Lucas Evers, Roel Klaasen and Peter Troxler, the latter who is also part of the panel of experts REMODEL works with. The book can be bought as paperback, or be read for free [online](#).
- The toolkit [‘Best practice for open source hardware’](#) by Open Source Hardware Association, which has some good examples of elements of physical products which can potentially become open source.
- Last, but not least, P2P Foundation has a particularly useful wiki about open business: [Overview of new open business models](#) (also for manufacturing), [perspectives on open business models](#), [quotes from leading experts](#) and [an overview of a broad series of other resources](#).

The complexity of open source, open models and licenses

Before we wrap up this article, we'd like to point out that

when we, the Danish Design Centre, work with exploring open source-based business models and talk about openness, open models and open source in general, we've chosen to focus on the larger trends and examples that illustrate these. Therefore, we chose not to focus on the complexities that are naturally present when it comes to copyright and IP protection.

For example, Tesla Motors, who we've referred to multiple times in this article because they announced last year that everyone is allowed to use their patents, is not open source in the classic sense. They are simply acting somewhat accordingly, and as such worth taking into account when it comes to open source as a global trend. We chose not to focus on the degree of openness or legal foundations in the chosen examples, but stick to a pragmatic larger perspective which allows us to spot tendencies and learnings from all degrees of openness.

If you wish to make your product open source legally, you need an open license and it is a good idea to get familiar with the legal issues. You can do this by consulting the material found at [Open Source Hardware Association](#) (hardware and physical products), [Creative Commons](#) (content) and [Open Definition](#) (data and content). There are tonnes of good licenses and good resources, so get started with the above and let the web guide you from there. At the Danish Design Centre, we will be able to refer you to good lawyers who are experts in open source.

Contact

Have we missed something?

Do you know of any resources we should include in this package, or wish to know more about REMODEL and the work we do at the Danish Design Centre? Please contact Programme Director Christian Villum at cvi@ddc.dk.