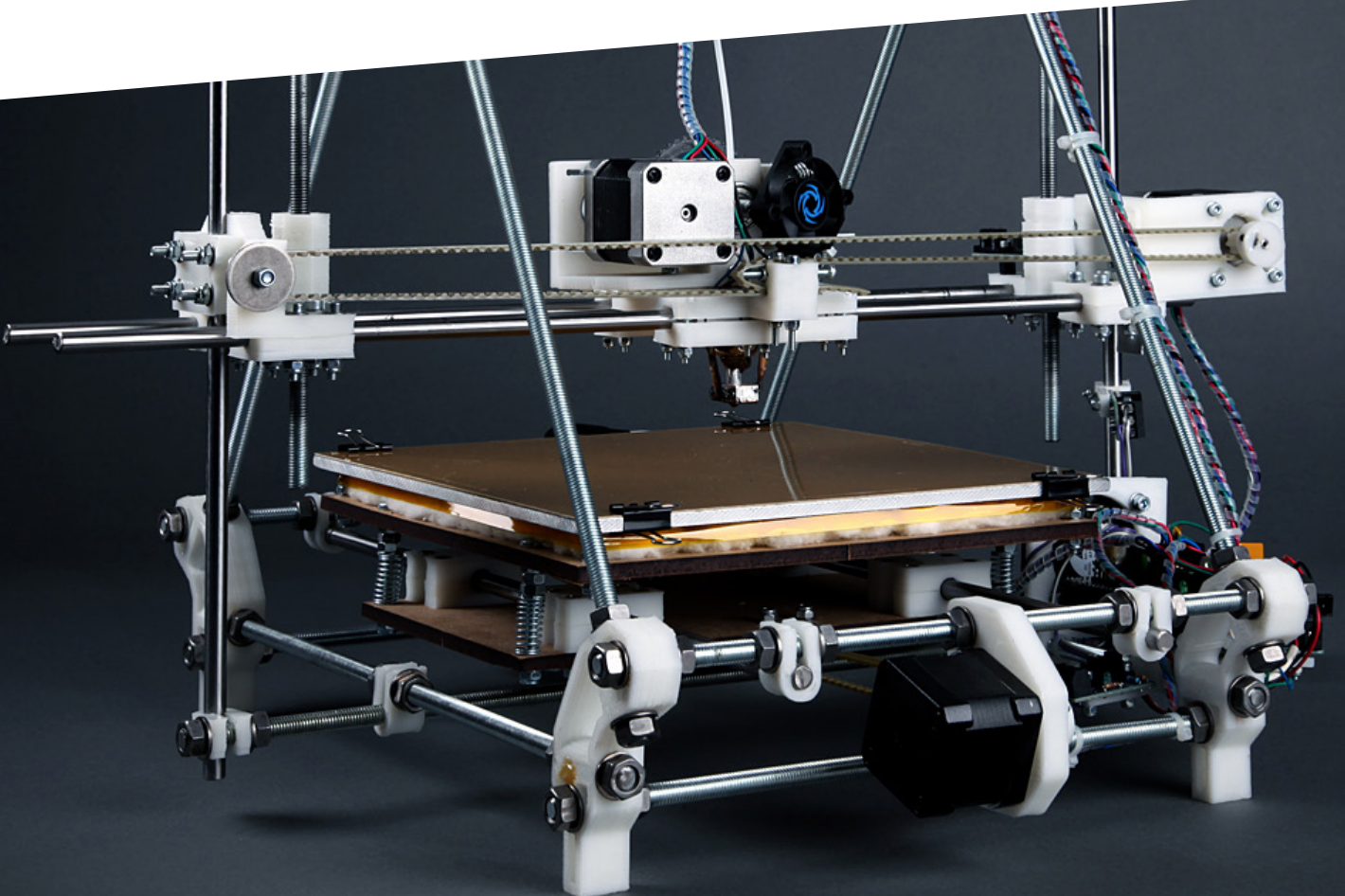Tobias Dupuch

Handout
May 2017

Innovation for all

01 Introduction

The image of the lonely innovator sitting in his basement with sketches or blueprints in front of him, working on the product the world has been waiting for – that will make him rich – might still be somewhere in the back of our heads.

Yet most people probably know for a fact that innovation is made behind closed doors in big companies that have teams whose genius is only surpassed by their secrecy.

But like the innovator in his basement, this too is an image that can't possibly be described as accurate anymore. Terms like open-source, open innovation and open design pop up. Information about how a product works can be looked at profoundly, much more often than one might think. Be it a machine that you can use to reproduce a large part of itself without having to pay a dime in royalties or Google's open-source operating system Android. The questions arise: Who opens up innovation and what are their agendas in doing so?

02 Machines making machines

The RepRap project

The Replicating Rapid Prototyper is a project that has it's roots in the University of Bath, England. It was started by Dr Adrian Bowyer, a senior lecturer in mechanical engineering in 2005

It is an assisted self-reproduction machine. Which in this context means, it is a machine that is able to reproduce a significant part of it's components by itself but needs assistance for the assembly.

The RepRap is basically a 3D-Printer, that uses fused-filament fabrication techniques, much like the now infamous MakerBot. However it's key to success lies in the fact that it is by design completely open source and requires no royalty payments whatsoever. Thus can be reproduced freely.

The Idea and the philosophy behind it

Opposing to what one might think, the process did not start with the goal of finding solutions to the technical difficulties that are faced when creating a
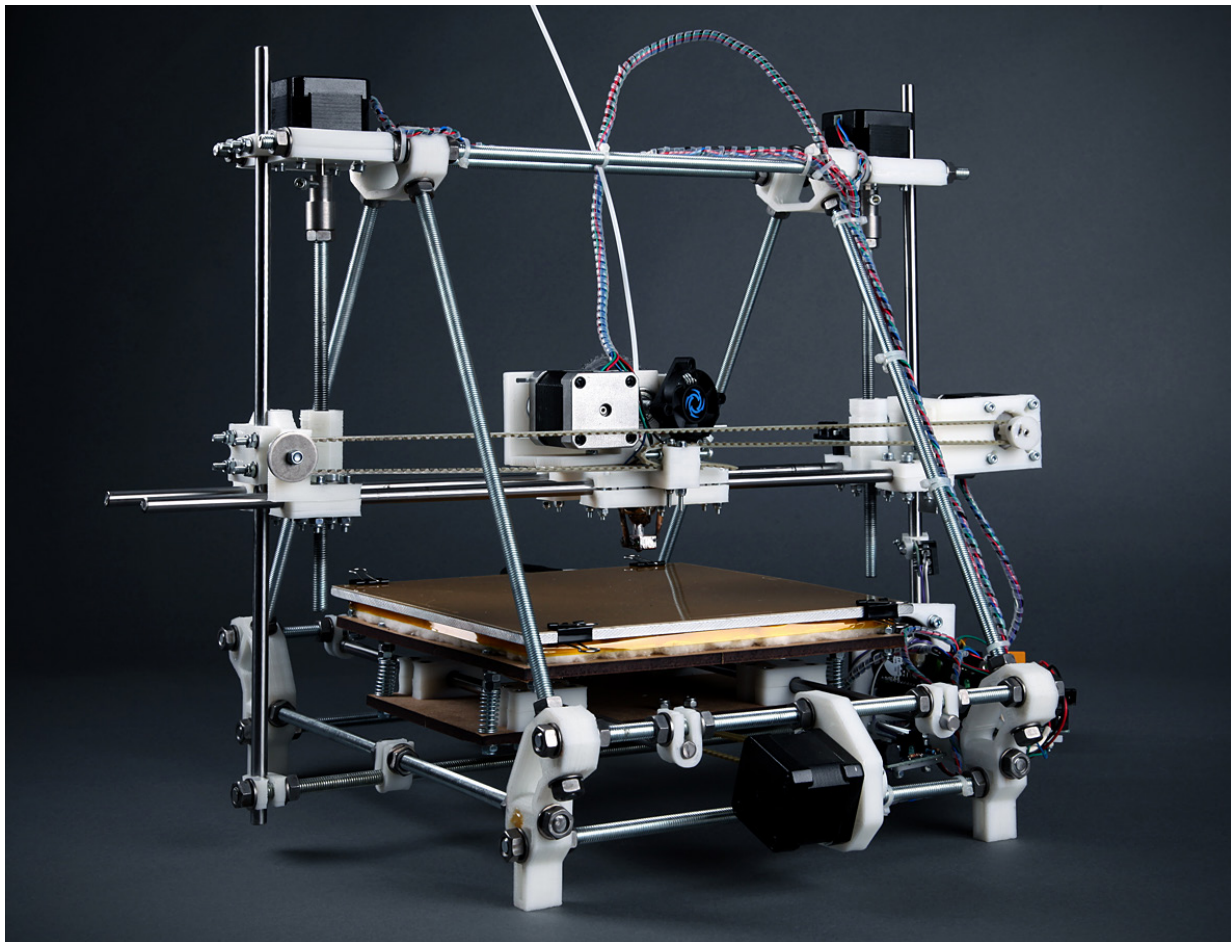
machine that can recreate itself. The seed that started the project was the idea of mimicking naturally evolved strategies of reproduction.

Based on the biological fact that almost every species on this planet is somehow dependent upon another species in some way for its survival and breeding, Bowyer – in contrast to most research into artificial reproduction – asked the question if it is important for terrestrial reproducers to be as autostrophic as possible.

Among others, the red clover and it's dependency on the humble bee is referred to specifically. Partly because of the way the bee is rewarded with nectar which makes a perfect analogy to how the RepRap could work.

The machine can easily make objects accurately, repeatably and tirelessly. The human hand can solve manipulative tasks without any problem. The rewarding nectar would then be that while the machine is not reproducing itself, it can produce products for the human.

By releasing everything under a software libre license that doesn't require any form of payment the RepRap should then evolve trough artificial, rather than trough natural selection. The Plan was to get users to improve the design of the printer and re-uploading it, so the improvements can be adopted.

03 Open everything

Open source & open design

The term open source was coined in 1998 in Paolo Alto, after the release of the Netscape source code. Open source software, as opposed to proprietary software comes with an open source license. These usually give everyone the right to use, study, modify and distribute the software. Since by design, open source software promotes collaboration and sharing, it is common that it comes with a so-called copy-left license. This means that anyone who releases an edited copy of the program must also release the modified source code.

The term open design is used much more for hardware and physical products like the RepRap Project, or for 3D printed open licensed products overall.

Motivation

While the open source movement still does stand for sharing and collaboration and a lot of times it's sole motivation actually is innovation – proof for this are various web technologies like apache – there are companies using open source software to indirectly benefit in the market. Google's operating system Android for example, is completely open source and free to use. Thus phone manufacturers modify it and sell it with their devices. Google then "offsets" it's cost through revenue they generate by distributing their Google apps via those android phones.

Open innovation

Other than open source, open innovation is a term that is much more linked to business strategies. In fact, it was coined by Henry Chesbrough who is an adjunct professor at the Haas School of Business at the UC, Berkeley and the Author of the Book "Open Innovation: The New Imperative for Creating and Profiting from Technology".

While traditionally a company would put a lot of time and money into research and development internally. The idea of open innovation is to either bring external ideas into the firm, by investing in startups or individuals or by giving academic facilities insight in processes, or by allowing un- or under utilized ideas and technologies go outside of the firm into others' innovation processes.

04 Conclusion

The open source history and the fact that open innovation even is a business strategy proofs that opening up the process of innovation does in a lot of cases drive it.

The open source movement has brought us the Internet as we know it today and shows no signs of stopping. It actually is more often than not working for progress and nothing else.

Based on the example of Google, there clearly are companies who use this environment for their benefit. In April 2015 the European commission initiated formal antitrust proceedings against Alphabet, Google's parent company.

The RepRap project had a totally different purpose. It's openness was part of the concept and even though one could argue that the fraction of the parts by count of the machine that it makes for itself is only 48%, it was a great success and an incredible example of open and collaborative innovation.

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