

## Preface

When I first came across the open source software phenomenon, I had no idea I would find it interesting enough to dedicate significant time and energy to writing a book about it. But I did, and in retrospect it's hard for me to say whether writing this book was more work or pleasure. The final product is a work, but writing it was certainly a pleasure. In some ways I've done what many programmers who voluntarily contribute to the development of open source software do: created something useful with a passion together with others who share the same interest.

The open source phenomenon basically started as a protest against proprietary commercial software and yet it is now under the widespread scrutiny of companies and governments. Millions of programmers make up the open source community, and universities, companies and governments around the world have become indirectly and directly involved in the phenomenon.

Why has open source software attracted all of this attention? Can it offer a new economically sustainable software development model? What are the social implications of this new model? Can it be exported to fields outside the software industry?

There is no doubt that the open source phenomenon has attracted attention because it brings together many of the other phenomenon that affect all of our lives daily: the digital revolution and economics of digital products, the controversies over intellectual property rights, the Internet, new ways of organizing the production of products and services, etc.. These phenomena bring up issues that can be studied from technological, economic, legal and sociological points of view.

Software is a digital product. There are certain characteristics of digital products that make them different from physical goods. Digital products are easy to copy and the results are as perfect as the originals. They are easy to transfer quickly to any part of the world, overcoming national borders, customs, etc. Finally, they can easily be modified to produce a new version of the original. Software is not the only product in the digital revolution. On the contrary, literary and artistic works, once they are put into digital format, take on the characteristics of digital products. The widespread evolution of digital products in many different fields has led to a heated debate on the protection of intellectual property.

Copyright and patent law were developed in an era when the products being invented were physical products and the works created were in a physical format. Clearly it becomes difficult to apply these laws in the same way to information goods and digital products. There have been two opposite reactions to this problem. On the one hand, the open source community has exploited copyright law and uses it to protect the freedoms to reproduce, modify and re-use software. On the other hand, commercial software companies are turning more and more to software patents to protect their intellectual property.

The open source community is not alone in promoting the philosophy of openness and free access. This philosophy is spreading to other areas of knowledge and human creativity and invention. New forms of intellectual property rights protection are being applied to music, photography, educational materials, etc., as is the case of the creative commons licenses. The basic idea behind this concept of openness is that sharing one's own work on the web not only offers greater opportunities for diffusion but for collaborating with peers on improving the work as well.

Internet potentially means the "death of distance", openness, freedom of access and expression, non-exclusiveness, no control, and democracy. Not all of these concepts have proven to hold true and, therefore, continue to be a sort of promise of what the Internet can still become. As the sociologist Manuel Castells has pointed out, the Internet was created in the context of a pre-existing need for being connected and for flexibility. The Internet is above all a tool for social communication. Many technologies are social constructions, but this is especially true in

the case of Internet technology since its reach is so vast that it has become an extraordinary social phenomenon.

The Internet has also brought about new forms of production organization. As Castells has observed, though networks might be more flexible than bureaucratic organizations, they have also proved to be less efficient than centralized organizations in guaranteeing the coordination of production. In the past, networks were a privileged form of interpersonal relationships while organizations were responsible for production. Today networks have become more efficient thanks to the flexibility the Internet and new ICT tools offer. They are now able to manage greater complexity and they can work alongside a centralized organization in managing production.

What is most interesting about the open source phenomenon is the possibility it offers to “produce” a product in a way that is completely new and different from the way production traditionally takes place in a company. Eric Raymond, in his work *The Magic Cauldron*, says that “[t]o many people, the successes of the open-source community seem like an implausible form of magic. High-quality software materializes ‘for free’, which is nice while it lasts but hardly seems sustainable in the real world of competition and scarce resources”. Products like the Linux operating system and Apache web server software have proved these “many people” wrong.

This completely different way of producing software inevitably leads to a series of questions and considerations regarding the evolution and transformation of our way of conceiving work organization, project organization and even company organization. The Information Revolution and development of networks have produced phenomena such as the growing connection between elements which are often extremely different from one another (computers, people, even smart objects). This has led to phenomena which cannot be planned according to a top-down logic, but, on the contrary, “emerge” from interactions between elements and therefore “from the bottom”. The approach most suitable for analyzing these phenomena is bottom-up thinking. With the development of information networks, and Internet in particular, it has been observed that not all phenomena which are developed can be

designed and planned. In other words, networks involve social structures which make phenomena, to a certain degree, “emergent”.

The way programmers in the open source community work may also lead us to re-think how we define work, or at least intellectual work. Their involvement in the open source community is voluntary and they dedicate their free time to doing the “work” of programming. The boundaries between work and pleasure are blurred. Linus Torvalds, the creator of the original Linux kernel, stated: “Linux was a hobby”. Or in Raymond’s words: “You need to care. You need to play. You need to be willing to explore”. We could even go so far as to speak of a new work ethic based on passion, freedom, openness, and the social value of what one does.

In many ways, writing this book I too have been influenced by this new ethic. Like programmers in the open source community, writing this book has been a mix of work and play, and a job I have done with a great passion. Finally, again like the programmers, I hope to have made a useful and interesting contribution to the general community.

I did not embark on this journey alone. First of all, I must thank Matteo Faldani, co-author of a book in Italian on open source software (*Open Source. Strategies, organization, perspectives*, Il Mulino, Bologna, 2004). Matteo researched many of the more technical aspects of open source software that appear, in an updated version, in this book as well.

I would especially like to thank Sarah Guth, an ESL teacher at the University of Padua. She initially became involved in the project when I asked her to help me translate the book. However, she was soon affected by my own passion and enthusiasm. She proved to be a precious companion in this journey, helping me not only translate but better develop concepts that were still not clear in the book. She also helped me carefully check the facts and figures in this book doing her own research.

Finally, I must thank many of the students in my courses who over the past two years have contributed to the contents of this book with their suggestions, research and papers. I never could have completed the book without the precious help of these people. Nonetheless, I assume all responsibility for the contents in the book.

The open source phenomenon is still quite young and is changing and evolving at a very fast speed. Therefore, there is no way around the fact

that some of the information in this book will become quickly outdated. Nonetheless, I hope that readers find the book useful and a stimulus for further research on this, what I consider to be, extremely interesting phenomenon.

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