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* This monograph will be also published in Spanish (full version printed; summary, abstracts, and some articles online) by **Novática**, journal of the Spanish CEPIS society ATI (*Asociación de Técnicos de Informática*) at <http://www.ati.es/novatica/>, and in Italian (online edition only, containing summary, abstracts, and some articles) by the Italian CEPIS society ALSI (*Associazione nazionale Laureati in Scienze dell'informazione e Informatica*) and the Italian IT portal Tecnoteca at <http://www.tecnoteca.it/>.

Presentation

Libre Software under The Microscope

Jesús M. González-Barahona and Stefan Koch

1 Foreword

Libre (free, open source) software has evolved during the last decade from an obscure, marginal phenomenon into a relatively well-known, widely available, extensively used set of applications. *Libre* software solutions are even market leaders in some segments and are experiencing huge growth in others. Products such as OpenOffice.org, Linux, Apache, Firefox and many others are part of the daily experience of many users. Companies and public administrations alike are paying more and more attention to the benefits that *libre* software can provide when used extensively.

However, despite this increasing popularity, *libre* software is still poorly understood. Perhaps because of this, in recent years the research community has started to focus some attention on *libre* software itself: its development models, the business models that surround it, the motivations of the developers, etc. In this context, we (invited by **UPGRADE** and **Novática**, two journals that have shown for years a serious interest in this field¹) felt that the time was ripe to put together this monograph on "*Libre Software as A Field of Study*". Consequently, we issued a call for contributions, which led to a process in which each proposal was reviewed by at least two experts in the field.

2 Definition

The term "*Libre* Software" is used in this introduction, and in the title of this special issue, to refer to both "free software" (according to the Free Software Foundation, FSF, definition) and "open source software" (as defined by the Open Source Initiative, OSI). "*Libre*" is a term well understood in romance languages (i.e. from Latin origin), such as

Spanish, French, Catalan, Portuguese and Italian, and understandable in many others. It avoids the ambiguity of "free" in English, since "*libre*" means only "free as in free speech", and the term is used in Europe in particular, although its first use can be traced to the United States².

Libre software is distributed under a license that complies with the "four freedoms", as stated by Richard Stallman in "The Free Software Definition":

- The freedom to run the program for any purpose (freedom 0).
- The freedom to study how the program works and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbour (freedom 2).
- The freedom to improve the program and release your improvements to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this.

Therefore, *libre* software is defined by what users can do when they receive a copy of the software, and not by how that software was developed, nor by whom, nor with what intentions.

However, although there is nothing in the definition about how the software has to be produced or marketed to become "*libre*", the four freedoms enable some development and business models while making others difficult or impossible. This is why we often talk about "*libre* software development models" or "*libre* software business models". Both terms are not to be understood as "models to be fol-

The Guest Editors

Jesús M. González-Barahona teaches and researches at the *Universidad Rey Juan Carlos*, Madrid, Spain. He started working in the promotion of *libre* software in the early 1990s. Since then he has been involved in several activities in this area, such as the organization of seminars and courses, and the participation in working groups on *libre* software. He currently collaborates in several *libre* software projects (including Debian), and participates in or collaborates with associations related to *libre* software. He writes in several media about topics related to *libre* software, and consults for companies on matters related to their strategy regarding these issues. His research interests include *libre* software engineering and, in particular, quantitative measures of *libre* software development and distributed tools for collaboration in *libre* software projects. He is editor of the Free Software section of **Novática** since 1997 and has been guest editor of several monographs of **Novática** and **UPGRADE** on the subject. <jgb@gsync.escet.urjc.es>

Stefan Koch is an Assistant professor of Information Business at the Vienna University of Economics and Business Administration, Austria. He received a MBA in Management Information Systems from Vienna University and Vienna Technical University, and a Ph.D. from Vienna University of Economics and Business Administration. His research interests include *libre* software development, effort estimation for software projects, software process improvement, the evaluation of benefits from information systems and ERP systems. He is also the editor of the book "Free/Open Source Software Development", published by IGP in 2004. <stefan.koch@wu-wien.ac.at>.

lowed to qualify as *libre* software", but simply as models which are possible, perhaps common, in the world of *libre* software.

3 Aspects of Study

Taking this definition as our framework, there has been a great deal of research in recent years about development and business models for *libre* software, about the motivations of developers producing that software, and about the implications (economic, legal, engineering) of this new approach. In other words, *libre* software has become in itself a subject for study; a new field in which different research approaches are being tried in order to increase our understanding of it. How is *libre* software actually being produced, what room for improvement is still left, which best practices can be identified, what implications does *libre* software have for users and producers of software, how can *libre* software development be improved, which ideas and processes can be transferred to the production of proprietary software, what insights can be gained into open creation processes and user integration, etc. are just some of the questions being addressed by this research. Some of them are standard questions only now being put to the *libre* software world; others are quite specific and new.

4 Papers in This Monograph

This monograph issues contains seven papers that cover several of the topics mentioned above and make use of a great variety of empirical and theoretical approaches. The first paper, by **Andrea Deverell** and **Par Agerfalk**, is about the CALIBRE (Co-ordination Action for LIBRE Software) project, funded by the European Commission to improve European research in the field of *libre* software.

After this comes a paper entitled "*Libre Software Movement: The Next Evolution of The IT Production Organization?*", written by **Nicolas Jullien**, which discusses the dissemination of *libre* software. It argues from a historical perspective that *libre* software constitutes the next evolution in industrial IT organization.

The next few papers deal with workings within *libre* software projects. **Juan-José Amor-Iglesias**, **Jesús M. González-Barahona**, **Gregorio Robles-Martínez** and **Israel Herráiz-Tabernero**, in their paper "*Measuring Libre Software Using Debian 3.1 (Sarge) as A Case Study: Preliminary Results*", show empirical results from one of the most popular and largest projects in existence, based on an analysis of source code. **Charles M. Schweik** tries to identify design principles leading to a project's success or failure; in his paper "*An Institutional Analysis Approach to Study-*

ing Libre Software 'Commons'" he presents a framework for analysing the institutional design of commons settings to be applied to *libre* software projects. Finally, **Sandeep Krishnamurthy**, using Mozilla Firefox as an example, challenges the view that in *libre* software projects, anyone can participate without hindrance. He coins the term "closed-door project" for projects with a tight control and explains why such a strategy might be adopted in his paper "*About Closed-door Free/Libre/Open Source (FLOSS) Projects: Lessons from the Mozilla Firefox Developer Recruitment Approach*".

The issue concludes with two papers which aim to put *libre* software and its development in the context of 'mainstream' software engineering practices. **Alberto Sillitti** and **Giancarlo Succi** in their paper "*Agility and Libre Software Development*" evaluate the relationship and commonalities between agile software development methodologies, in particular eXtreme Programming, and *libre* software development. **Christian Neumann** and **Christoph Breidert** present a framework for comparing different reuse strategies in software development. In their paper titled "*The Challenges of Using Open Source Software as a Reuse Strategy*" they give special consideration to the required technical and economical evaluation.

Acknowledgments

As with any work, this monograph would not have been possible without the help of several people. Naturally, the most important work was carried out by the authors themselves, and the reviewers also devoted their time to help in selecting and improving the submissions. In total, 16 authors contributed submissions, and 16 people provided valuable feedback and assistance by helping with the reviewing. Following the ideals of *libre* software development, these reviewers are named here in order to give special recognition of their contribution: **Olivier Berger**, **Cornelia Boldyreff**, **Andrea Capiluppi**, **Jean Michel Dalle**, **Rishab Ghosh**, **Stefan Haefliger**, **Michael Hahsler**, **George Kuk**, **Björn Lundell**, **Martin Michlmayr**, **Hans Mitloehner**, **Martin Schreier**, **Ioannis Stamelos**, **Ed Steinmueller**, **Susanne Strahinger**, and **Thomas Wieland**.

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¹ **Novática**, in addition to have a section dedicated to this field since 1997, has published three monographs on it – 1997, 2001, and 2003 – jointly with **UPGRADE** in the last two cases (see <<http://www.ati.es/novatica/indice.html>> and <<http://www.upgrade-cepis.org/pages/pastissues.html>>).

² For a brief study of the origins of the term "*libre* software", visit <<http://sinetgy.org/jgb/articulos/libre-software-origin/>>.

Useful References on *Libre* Software as A Field of Study

In addition to the references included in the papers that make part of this monograph, readers who wish to understand the *libre* (free, open source) software phenomenon in greater detail may be interested in consulting the following sources.

Books


- C. DiBona, S. Ockman, and M. Stone (eds.). Open Sources: Voices from the Open Source Revolution. O'Reilly and Associates, Cambridge, Massachusetts, 1999. Available at <<http://www.oreilly.com/catalog/opensources/book/toc.html>>.
- J. Feller and B. Fitzgerald. Understanding Open Source Software Development. Addison-Wesley, London, 2002.
- J. Feller, B. Fitzgerald, S.A. Hissam, and K.R. Lakhani (eds.). Perspectives on Free and Open Source Software. The MIT Press, Boston, Massachusetts, 2005.
- J. García, A. Romeo, C. Prieto. La Pastilla Roja, 2003. ISBN: 84-932888-5-3. <<http://www.lapastillaroja.net/>>. (In Spanish.)
- S. Koch (ed.). Free/Open Source Software Development. Idea Group Publishing, Hershey, PA, 2004.
- V. Matellán Olivera, J.M. González Barahona, P. de las Heras Quirós, G. Robles Martínez (eds.). Sobre software libre.

Compilación de ensayos sobre software libre. GSYC, Universidad Rey Juan Carlos, 2003. Available at <<http://gsvc.escet.urjc.es/~grex/sobre-libre/>>. (In Spanish.)

- E.S. Raymond. The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary. O'Reilly and Associates, Sebastopol, California, 1999.
- R.M. Stallman. Free Software, Free Society: Selected Essays of Richard M. Stallman. GNU Press, Boston, Massachusetts, 2002. Also available at <<http://www.gnu.org/philosophy/fsfs/rms-essays.pdf>>.

Web Sites

- Opensource, a collection of publicly accessible papers about *libre* software. <<http://opensource.mit.edu>>.
- Slashdot, the community site for the worldwide *libre* software community. <<http://slashdot.org>>.
- Sourceforge, the largest hosting site for *libre* software projects. <<http://sourceforge.net>>.
- Free Software Foundation. <<http://fsf.org>>.
- Open Source Initiative (OSI). <<http://opensource.org>>.
- BarraPunto, the community site for the Spanish *libre* software community. <<http://barrapunto.com>>.



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