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Handbook of Research on Open Source Software: Technological, Economic, and Social Perspectives

Book Review

—Reviewed by

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Index Terms—*Computer software, open source software, shareware.*

The *Handbook of Research on Open Source Software* is a reference book that belongs in every technical library; it held my attention for more than three months, and it probably will continue to do so for some time to come. The book is divided into seven sections, and each section contains five to ten chapters. As Stefan Koch, Vienna University of Economics and Business Administration, Austria, says in the Foreword:

This handbook succeeds in bringing together papers addressing the whole range of topics in the area of open source software. Given the diversity of this field, this is not an easy task, but researchers, managers and policy-makers will all find interesting answers and even more interesting new questions within the pages of this handbook. [p. xxvi]

The book is a rich source of research topics on open source software (OSS) that can be used in any computer-related curriculum.

The list of contributors reveals that the 103 authors (author count in parentheses below) are associated with universities in 20 countries: Hungary (1), Sweden (1), United Kingdom (1), Greece (2), Israel (2), Taiwan (2), Trinidad and Tobago (2), Uganda (2), Belgium (3), Canada (3), France (3), United Arab Emirates (3), the Netherlands (4), South Africa (5), Brazil (6), Germany (6), Australia (7), Finland (12), Italy (12), USA (26). The book contains 54 papers. Twenty-five (22.33%) of the authors are women, a statistic that I find quite alarming, considering the importance of computing in general

in today's society. According to the National Science Foundation, the number of B.S. degrees awarded to women in the United States was 28% in 2003, compared to 38% in 1985. It is to the credit of the editors that several of the papers in this handbook address the lack of inclusion of women and minorities. The global range is admirable, and the "About the Contributors" section, which provides short profiles of the authors, is an interesting read.

The nine chapters in Section I, "Culture, Society, and Open Source Software," provide a historical and contextual overview of free/libre open source software (FLOSS) and OSS. Starting with "Free Software Philosophy and Open Source," which provides the historical background of OSS, the section continues with "Greasemonkey and a Challenge to Notions of Authorship," in which Ballentine attempts to answer Michel Foucault's question: What is an author? The chapter foreshadows later chapters on licensing issues. Yeats explores the "Morality and Pragmatism in Free Software and Open Source," while Lin examines the lack of diversity of hacking communities and makes a case for "the importance of integrating end-users and minorities in this dynamic world (e.g., women, the vision-impaired, and people from developing countries)" into the process of open source innovation [p. 43]. Chapter 5, da Rimini's "Social Technologies and the Digital Commons," stands out because it opens up a window to other parts of the world—a world outside Google and Facebook. Da Rimini sets forth the idea that OSS is a way to "connect and mobilise diverse communities, interest groups, and audiences; spanning local, regional and global levels" [p. 47]. She discusses three examples of OSS used to create the Digital Commons:

Like Dyne:bolic and Streamtime, the Container Project harnesses social technologies with creative expertise to create a platform

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for cultural expression and exchange for disenfranchised communities. [p. 55]

Chapter 6, a collaboration of five authors, proposes a framework for the use of “an OSS-based environment supporting the execution of cooperative scientific experiments” [p. 71]. Chapters 7–9 discuss the practical application of OSS at Uganda Martyrs University [p. 79], the University of the West Indies, St. Augustine Campus in Trinidad and Tobago [p. 93], and in three technologically developing countries—China, South Korea, and India [p. 102].

In Section II, “Development Models and Methods for Open Source Software Production,” the five chapters (10–14) cover aspects of OSS communities, networking, patchwork prototyping, agile development, migration to the desktop, and social order, respectively. Chapter 12, “An Agile Perspective on Open Source Software Engineering,” examines the successful OSS Mozilla and Apache projects. The authors of Chapter 13, “A Model for the Successful Migration to Desktop OSS,” analyze

three case studies of desktop OSS in South Africa, one in the educational sector, one in the governmental sector, and one in a commercial organization. [p. 158]

They use a practical example to address “critical success factors... that are not addressed in the migration guidelines and frameworks identified earlier,” followed by a proposal for a “BRW Migration Model for Desktop OSS” [p. 159]. The chapter validates the existence of this handbook.

The ten chapters (15–24) in Section III, “Evaluating Open Source Software Products and Uses,” cover strengths and weaknesses of software products, evaluation of software, web portals, open source outside the software domain, GNU/Linux for Windows infrastructure, content management systems, prototyping, motives and methods for quantitative research, comparison of open source and commercial database management systems, and migration to open source software. The section has 242 pages and is the largest section of the book. Van den Berg’s well-written Chapter 16, “Open Source Software Evaluation,” overviews models and articles that are useful for evaluating OSS. She concludes that the process of evaluating OSS is developing and that

given how recent the rest of the literature discussed in this chapter is, it is likely that more will be published on the subject in the next few years. [p. 207]

Chapter 17, “Open Source Web Portals,” provides an overview of SourceForge.net, Apache, Tigris, ObjectWeb, and Savannah. Braganholo, Miranda, and Mattoso signed on as users of these portals, and using the provided documentation and exploring the restricted user areas of each web portal, they provide a useful comparison chart [p. 223]. Chapter 20 also has practical value because it compares and contrasts four OS content management systems: Moodle, Drupal, Xoops, and Mambo. The authors installed the management systems on local machines and did a comparison. The other chapters in the section are equally interesting; the only exception is Chapter 15, “Open Source Software: Strengths and Weaknesses,” which brings very little new information to the table. It might be better placed in Section I. The brief section on OSS business models, however, would make a great topic for a future paper.

Section IV, “Laws and Licensing Practices Affecting Open Source Software Uses,” has four excellent chapters that provide a solid overview of the legal issues: Chapter 25, “Legal and Economic Justification for Software Protection,” by de Vuyst and Fairchild; Chapter 27, “The Road of Computer Code Featuring the Political Economy of Copyleft and Legal Analysis of the General Public License,” by Cunningham; Chapter 30, “Examining Open Source Software Licenses through the Creative Commons Licensing Model,” by Lin, Lin, and Ko; and Chapter 28, “The Evolution of Free Software,” by Klang. The title of the last chapter should really be “The Evolution of the Free Software Foundation General Public License (GPL)” because Klang does an admirable job of describing the GPL and its evolution to its second version. However, I find that at least two of the seven chapters are not in the correct section. Chapter 26, “OSS Adoption in the Legal Services Community,” by Agostinelli, would be better placed in Section V, “Public Policy, the Public Sector, and Government Perspectives on Open Source Software,” because it describes the implementation of a government-funded OS template that is used by several states to help pro bono lawyers collaborate. The same goes for Chapter 29, “Free Access to Law and Open Source Software,” by Poulin, Mowbray, and Lemyre, which describes the evolution of several communities that make legal documents available for the public at large. Both chapters discuss the community rather than the legal aspects.

Section V, “Public Policy, the Public Sector and Government Perspectives on Open Source Software,” is a thought-provoking section

containing six chapters. Chapter 32, "On the Role of Public Policies Supporting Free/Open Source Software," and Chapter 33, "Use of OSS by Local E-Administration: the French Situation," mostly focus on the European Union and the difficulty of integrating software across the many-layered French government and include concerns about privacy. Chapter 34, "Issues and Aspects of Open Source Software Usage and Adoption in the Public Sector," can serve as a strong platform for further investigation. Chapter 35, "The Labor Politics of Scratching an Itch," seems miscategorized. It would be better placed in Section I, "Culture, Society and OSS," where it would be a good companion for Lin's "Hacker Culture and the FLOSS Innovation." I also feel that Chapter 36, "Open Source Technology and Ideology in the Nonprofit Context," would be better placed in the "Laws and Licensing" section. In the introduction, the author makes a case for the social responsibility of proprietary software companies, but the cases presented are related to security issues and the circumvention of laws across country borders. Chapter 37, "Governance and the Open Source Repository," is a well-written paper that would be a great opening chapter for the "Evaluation of Open Source Software" section because Stephens builds an excellent structure on which to hang an evaluation project. A case can be made for putting the chapter in the section on business as well because the author gives a good framework that can be used for keeping track of how OSS applications fit into the business perspective.

Section VI, "Business Approaches and Applications Involving Open Source Software," provides a plethora of topics about business and OSS community interaction. First, Stam and van Wendel de Joode's "Analyzing Firm Participation in Open Source Communities," and Langdon and Hars's "Open Source Software Business Models and Customer Involvement Economics," explore positive cooperation of businesses with OSS communities. In Chapter 41, "Investing in Open Source Software Companies: Deal Making from a Venture Capitalist's Perspective," Puhakka, Jungman, and Seppänen surmise that

it seems that rather than putting effort into further understanding valuation methodologies, entrepreneurs should seek help in learning better negotiation skills. [p. 539]

Chapter 42, "Revenue Models in the Open Source Software Business," uses "Redhat and MySQL, both of which illustrate the complexity and heterogeneity

of solutions and options in the field of OSS" [p. 541]. The section would be well placed in a business curriculum. In "Open Source for Accounting and Enterprise Systems," Tribunella and Baroody give a good overview of the available "small to medium and enterprise-scale business systems" [p. 559]. In Chapter 44, "Open Source Software and the Corporate World," some of the disputes between OSS and proprietary software companies are brought to light. This chapter is also of interest for its legal information:

In 2005, Columbia University law professor Eben Moglin formed the Software Freedom Law Center to help protect OSS development from similar litigation. [p. 573]

The section closes with a description of how the declining proprietary software company Novell revived itself by going the OSS route.

The eight chapters in Section VII, "Educational Perspectives and Practices Related to Open Source Software," cover support and promotion of OSS in a university environment, selection of OSS for use in school, OSS course management systems, journal management software, innovative OSS desktop implementation, industry-sponsored, OS-based infrastructure for university classrooms, wikis used for OS learning, and software engineering education with OSS. Chapter 49, "Open Source E-Learning Systems: Evaluation of Features and Functionality," presents an excellent in-depth comparison of ten course management systems. Chapter 52, "Rapid Insertion of Leading Edge Industrial Strength Software into University Classrooms," provides an overview of the Shared Software Infrastructure Program (SSIP), an industry-sponsored infrastructure. The program not only provides the software, but it also provides servers on which the students can test their applications. The section ends with Chapter 54, "A Perspective on Software Engineering Education with Open Source Software," which suggests guidelines and discusses the MIT OpenCourseWare and Rice Connections initiatives.

Because I expect that many readers of this review are members of the IEEE Professional Communication Society (PCS), I cannot end this review without commenting on the handbook from a professional communication point of view. I understand that the task of putting together a large handbook is enormous. However, this book contains copyediting errors. For example, the title of Chapter 31, "FLOSS Legal and Engineering Terms and a License Taxonomy," indicates a very useful

chapter, but editing would improve the chapter's readability. Well-written research papers, such as those by Reijswoud and Mulo, van den Berg, Cunningham, Stam and van Wendel de Joode, and Solomon (to name just a few) are examples of good writing, yet even these chapters contain spelling errors, missing words, duplicate pictures [pp. 221–222], and missing table headers [pp. 644–645].

The index also disappoints. Because most people will not read a handbook cover-to-cover as I did, the index provides a useful cross-referencing tool. As I was reading Chapter 50, Solomon's "The Role of Open Source Software in Open Access Publishing," an excellent paper that is especially of interest to readers of this journal, I remembered that a previous chapter described a CMS called Drupal that PCS is using for its online newsletter. But alas,

"Drupal" does not appear in the index. It took me about five minutes to locate the relevant chapter, "Issues to Consider when Choosing Open Source Content Management Systems (CMSs)," by Boateng and Boateng. It appears that the index is mainly constructed from the keywords provided by the authors. For instance, the entry for the keyword phrase "source code" has seven references, but only one or two are relevant. While I was writing this review, I encountered other occasions when the index failed to provide me with the information that I needed.

In conclusion, I have to say that despite its flaws, I can recommend the handbook wholeheartedly. All chapters are thought provoking; there is just not enough room to mention all of them in this review.