Foreword

THE MANY QUESTIONS FROM OPEN SOURCE SOFTWARE…

Open source software has for some years been one of the most hotly debated topics, both in research and in practice. One reason for this is that several open source products like GNU/Linux or Apache have now for years been in the spotlight as leaders in their respective application areas, and continue to be so, while others like MySQL or even ERP packages come to the front in new application areas not traditionally associated with open source software. This fact has demonstrated one thing, to people from academia, industry and public organizations: Open source projects can indeed lead to software systems that exhibit and maintain high functionality and quality.

Nevertheless, there are numerous questions remaining, of interest to different groups. While researchers want to uncover the mechanisms and reasons for this development model to work, management wants to know how to use open source software to its fullest advantage or how to base a business on it, and public organizations both on the national and international level struggle with the question of how to deal with this phenomenon. 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.

Scanning the different entries gives a great impression of what different subjects currently garner the most attention.

OSS Evaluation and Adoption

Given the amount of different projects, even within a set application area, this is a growing concern, especially with practitioners. For example, van den Berg gives an overview of approaches to evaluating open source software in "Open Source Software Evaluation," while Carbon, Ciolkowski, Heidrich, John, and Muthig present a new method of evaluation through prototype development in "Evaluating Open Source Software through Prototype Development." Also some special cases (the IT in schools by Moyle in "Selecting Open Source Software for Use in Schools") and concrete application areas like content management systems ("Issues to Consider when Choosing Open Source Content Management Systems (CMSs)" by Boateng and Boateng), database management systems ("A Generalized Comparison of Open Source and Commercial Database Management Systems" by Evdoridis and Tzouramanis) or business functions ("Open Source for Accounting and Enterprise Systems" by Tribunella and Baroody) are explored in detail. But evaluating and choosing an optimal open source software does not end the process, adoption does not depend on software functionality and quality alone. For example, Rossi, Russo, and Giancarlo Succi detail migrations in public administrations ("Evaluation of a Migration to Open Source

Software"), and Brink, Roos, Van Belle, and Weller propose a model for desktop migration ("A Model for the Successful Migration to Desktop OSS"), backed up by a case study ("An Innovative Desktop OSS Implementation in a School"). Of special interest is the entry by Humes titled "Communities of Practice for Open Source Software," in which concepts from theory of planned behavior are used in a case study showing the positive effects of establishing communities of practice for adoption and diffusion. Following the increased adoption rates, most IT architectures today tend to become hybrid incorporating both proprietary and open source software, with Vinicius acknowledging this fact and exploring the concept of transaction costs in the context of information infrastructures ("Reducing Transaction Costs with GLW Infrastructure"). Lastly, Stephens takes a look beyond a single adoption or migration project and proposes establishing a centralized repository for downloading certified open source products to ensure good governance ("Governance and the Open Source Repository").

Areas of Special Interest: Science and Education

There are also a few areas that are of special interest regarding the adoption of open source software, for example the scientific process itself, which has often been compared to open source development. Bosin et al. propose an architecture for cooperative scientific experiments ("ALBA Architecture as a Proposal for OSS Collaborative Science"), and Solomon details "The Role of Open Source Software in Open Access Publishing." The other area is education, where beyond the entries already mentioned above, two more chapters highlight the importance of open source software in this context ("A Perspective on Software Engineering Education with Open Source Software" by Kamthan and "Rapid Insertion of Leading Edge Industrial Strength Software into University Classrooms" by Simmons, Lively, Nelson, and Urban).

OSS in Public or Nonprofit Organizations

Also of high interest, and in some areas overlapping with choosing and adopting open source software, is the relationship with public or nonprofit organizations. The interactions between open source and public organizations can be broadly grouped as adopting open source software, becoming co-developers or sponsors in projects and finally acting as regulatory authorities, most notably regarding software patents. The issue of adoption has already been touched on by some entries also in the context of public organizations; for example Favier, Mekhantar, and Terrasse delve into more detail in "Use of OSS by Local E-Administration: The French Situation," or Agostinelli in "OSS Adoption in the Legal Services Community." Moving from passive use to development or sponsoring, Laszlo provides an inductive general conceptual model of various public sector and government initiatives for promoting or using open source ("Issues and Aspects of Open Source Software Usage and Adoption in the Public Sector"), while Peizer explicitly contextualizes open source development and deployment in the nonprofit sector and discusses issues of ideology that often accompany its use ("Open Source Technology and Ideology in the Nonprofit Context"). Public policies in the European context also form the basis for yet another entry ("On the Role of Public Policies Supporting Free/Open Source Software" by Comino, Manenti, and Rossi). Finally, the role open source might play for developing countries is the topic of a chapter by Dudley-Sponaugle, Hong, and Wang, titled "The Social and Economical Impact of Open Source Software in Developing Countries."

OSS Business Models

These topics relevant for public organizations distinctly differ from private firms, which, beyond adopting open source software, increasingly participate in projects or explore related business model. In this handbook, business models feature in several entries: Seppänen, Helander, and Makinen give an introduction to this topic with "Business Models in Open Source Software Value Creation" and the basic message of this chapter is that the elements of a business model remain the same regardless of industry. Rajala, Nissilä, and Westerlund also take up this topic, and discuss revenue models, based on case studies of Red Hat and MySQL ("Revenue Models in the Open Source Software Business"). This is complemented by yet another famous and successful case study, Novell, by du Preez ("Novell's Open Source Evolution"). An interesting new viewpoint is introduced by Puhakka, Jungman, and Seppänen in their chapter "Investing in Open Source Software Companies: Deal Making from a Venture Capitalist's Perspective," in which they conclude that venture capitalists do not seem to put special value to open source companies, but some recognize different elements in evaluating those companies. Finally, Stam and van Wendel de Joode (Analyzing Firm Participation in Open Source Communities") explore the participation of firms in open source projects based on a survey. They distinguish between technical and social activities, and highlight factors leading to different types and levels of engagement. One important result concerns the finding that firms seem to view their internal investments in R&D as a complement to their external product-development activities in OSS communities.

OSS Theory

For the researcher, the reasons and workings behind open source software and its development are key topics. A number of entries in this handbook reflect this, which deal with the theoretic underpinnings of this movement. The discussion around the protection of software programs and open source licenses are manifold, and, for example, de Vuyst and Fairchild highlight this in "Legal and Economic Justification for Software Protection." Also related is an entry by Cunningham titled "The Road of Computer Code Featuring the Political Economy of Copyleft and Legal Analysis of the General Public License." Both chapters go beyond a strictly legal discussion as provided by Lin, Lin, and Ko in "Examining Open Source Software Licenses through the Creative Commons Licensing Model" and incorporate a political, social and economic perspective. Ballentine in a highly interesting chapter challenges the underlying notion of authorship itself ("Greasemonkey and Challenges to Authorship").

But open source software is not only based on its licenses, but also a different ideology or culture. These are the topics in three different entries: "Free Software Philosophy and Open Source" (Vainio and Vadén), "Morality and Pragmatism in Free Software and Open Source" (Yeats), and "Hacker Culture and the FLOSS Innovation" (Lin), a chapter acknowledging the importance of the continuously evolving hacker culture for open source, while discussing its changing mainstream perception. O'Donnell, in the chapter, "The Labor Politics of Scratching an Itch" also highlights the base for open source development by examining the relationships with educational, employment and work compensation and the results on the overall demographics of this movement.

OSS Development and Community

Lastly, open source software is also about software development and communities. The issue of whether this constitutes a new or more efficient way of production is one of the main questions surrounding this phenomenon. Gläser defines open source communities as production communities that apply a distinct mode of production of decentralized task definition ordered by the common subject matter of work ("The Social Order of Open Source Software Production"). Within this process, Hoppenbrouwers identifies "Community Customers," individuals or organizations who want to deploy an open source product, without having a direct aim to further develop the product, and who actively engage in the community to assure future suitability of the product, and discusses their role. In research, many theories can be developed or discussed, but ultimately need to withstand empirical validation. Empirical research into different aspects of open source software and its production has therefore been performed for some years now, and Conklin gives an overview of methods and results ("Motives and Methods for Quantitative FLOSS Research"). As an example, Järvensivu, Helander, and Mikkonen present an empirical case study on an open source project, where both the underlying technological and social networks, both internal and external, are explored. Finally, the relationships between open source software development and traditional software engineering techniques have often been discussed. Sahraoui, Al-Nahas, and Suleiman put this model in the context of agile software development practices, and uncover striking similarities ("An Agile Perspective on Open Source Software Engineering"), while Jones, Floyd, and Twidale propose a rapid prototyping-based approach to requirements gathering using open source software ("Patchwork Prototyping with Open Source Software").

This comprehensive handbook successfully demonstrates the diversity of subjects surrounding the deceptively simple term of *open source software*. This fact alone will ensure that in the future, open source software will certainly continue to be an issue for researchers and practitioners. We cannot yet foresee where this trend will go, or where it will take us, but one thing is certain: Open source software is here to stay.

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