

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

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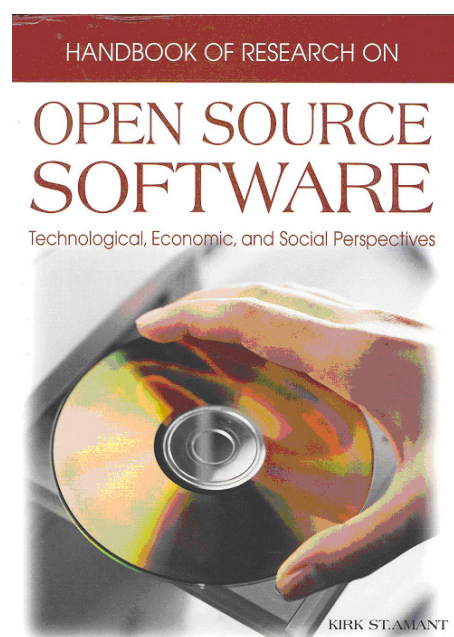
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The *Handbook of Research on Open Source Software - Technological, Economic, and Social Perspectives* focuses on open source code software, a topic that has been receiving growing attention from researchers from several different areas of knowledge. Such interest originates in the specific particularities of this object, and in the different perspectives through which it can be observed.

A software – comprised of a set of instructions to be executed by a computer – is somewhat similar to other intellectual, so-called intangible products, such as the text of this article, or a musical composition. Software is different, however, in that it is made to be executed by a machine, instead of being suitable for human fruition and interpretation. In order to bridge the gap between the format of commands received by the computer and the language of human communication, tools were developed over the last few years that receive a program expressed in a language more intuitive to humans - called *source code* – and translate it into machine instructions. Due to their complexity and volume, these instructions are hard to be understood by human beings and therefore comprise a singular software characteristic that finds no analogies in other types of intellectual production.

After an initial period at the early days of the computer industry, when software was freely offered with the purchase of a computer (large and expensive machines at the time), the software commercialization model known as *proprietary software* started to make use of this singular feature: with the purchase of a software



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the user actually acquires a license to use it, and receives a copy of the instructions to the machine. The original source-code that originated the instructions, however, remains in possession of the developer and / or of the owner of its copyrights. In this model users have no access to the software functioning mechanism (the source code), and can only use the functions that have been programmed in the machine instructions. Any desired alteration must be negotiated with the developers.

The open-source software phenomenon, or simply OSS, appears as an opposition to the *proprietary software* model. The OSS model, originally based on principles of sharing and collaborative development – also known as free software or *FLOSS (Free / Libre Open Source Software)*¹ – is based on making the source-code of the software available to the user, thus allowing them to study or modify it according to their needs. Additionally, usage licenses are not charged in the OSS model, and thus purchase costs are eliminated and the possibilities of software access are increased. This way, with the success and prominence obtained by some emblematic OSS projects (such as the Linux operating system) these OSS particularities have been raising a broad spectrum of questions about its characteristics and potentialities - either as a means for the production of knowledge, as a business model, or as a disseminator and vector of development – and about the implications of the new type of relationship with intellectual property established by the OSS and the social and legal issues resulting from it.

In this context, the *Handbook of Research on Open Source Software – Technological, Economic, and Social Perspectives* (HROSS) intends to map the multifaceted OSS phenomenon, providing the reader with a “foundational understanding of the origins, operating principles, legalities, social factors, and economic forces that affect the uses of open source software” (p. xxxiv) The book, edited by Kirk St. Amant and Brian Still - researchers for the Texas Tech University in the technical communication area, is a compilation of 54 contributions by 104 researchers from 12 different countries. As diversified and broad as the nationalities of researchers, the palette of OSS-related subjects and spheres included in the book encompasses from the evaluation and adoption of OSS in public and private organizations – with emphasis on their use in science and education – to the analysis of business models that use OSS, and OSS development, both concerning its more technical aspects and cultural factors and philosophical prerequisites of the OSS developer community. Therefore the reader should not expect to find a single key approach or global subject summarizing the different nuances and interpretation viewpoints; rather, the book presents a mosaic of questions and approaches about the OSS phenomenon capable of unveiling different perspectives to the interested reader. Although no chapter directly focuses on the use of OSS in the health sector, several considerations made in articles can be useful also in this context, either due to their generality (such as methodological, technological, or other issues less usage context-based), or to the common insertion into a broader context (such as aspects related to developing

countries and legalities, among others).

Since it is impossible to separately analyze each chapter I will now present a general overview of the seven sections contained in HROSS, which sort out the contributions according to each different theme.

Section I focuses on “Culture, Society and Open Source-Code Software”. Its chapters approach the origins of OSS (Chapter I), the implications of OSS on the idea of authorship (Chapter II), the nuances and philosophical differences among the proponents of denominations between *open-code software* and *free software* (Chapter III), as well as the cultural aspects inherent to the hacker community and to the community of free-software developers (Chapter IV and V). After chapter VI, which presents a more technical proposal for the architecture of OSS-based collaborative science, this section also includes a set of chapters (Chapters VII, VIII and IX) that approaches the issue of OSS potentials and implications on developing countries, frequently discussed in the academic environment and in international agencies for the promotion of development and fight against poverty. The section also examines the realities of African countries (Chapter VII), of a Latin American country – Trinidad and Tobago in Chapter VIII – and of three nations, with a highlight on technological issues among emerging countries: China, South Korea, and India (Chapter IX).

Section II focuses on development models and methods for the production of OSS, approaching them from a more technical standpoint – where software engineering methods are proposed and analyzed (Chapter XI and XII) – as well as by means of empirical software development studies that attempt to capture the social aspects of OSS development, such as the formation of social networks distributed among the developers (Chapter X) the social arrangement mechanisms existing in OSS production communities (Chapter XIV) The section also includes Chapter XIII, which analyzes three studies of migration cases from a proprietary software platform to OSS in South Africa, in an attempt to gather the critical success factors observed under a migration model.

This section concentrates contributions that attempt to evaluate the OSS products and uses under different perspectives. The term *evaluation* acquires quite different connotations in the works that comprise Section III, which employ from philosophical arguments from a societal standpoint (Chapters XV and XVIII), to criteria from a more technical point of view for OSS development tools (Chapter XVI, XVII, XX, XXI, and XXIII), to an economic analysis of the benefits of an OSS infrastructure based on its transaction costs (Chapter XIX), to evaluations that use analysis of quantitative data empirically collected (Chapters XXII and XXIV).

Section IV focuses on legalities and licensing practices affecting the uses of OSS that, as we saw above, have a core importance for the very definition of OSS and its practical applicability. The main issue discussed in the chapter is, therefore, the relation between OSS and intellectual property, and the core points are both the contrast with conventional intellectual property

protection methods (such as patents and authors' rights or copyright) and their conflicting relation with software (Chapter CCV), as well as the discussion on the copyleft guidelines and new licensing methods that appeared with the OSS movement to conceive its guidelines and put them into effect, such as the General Public Licenses (GPL) – Chapters XXVII, XXVIII, XXXI – and also, in a broader sense, the Creative Commons model (Chapter XXX). Additionally, Chapter XXVI features a case study of OSS adoption in a legal services community, and Chapter XXIX outlines an analogy between the movement of free access to laws and OSS movements.

The chapters of section five focus on public OSS policies, their use in the public sector, and related governance issues – a highly up to date subject, if we take into consideration the initiative by some countries, including Brazil, to adopt an official preferred guideline for OSS utilization in the government. Therefore, the works of Section V are of special importance, as they analyze arguments for or against a public intervention supporting OSS (Chapter XXXII), case studies and implications of the use of OSS in the public sector (Chapter XXXIII, XXXIV) and in non-profit organizations (Chapter XXXVI), as well as its discussions on the (im)possibility of participation of non-specialist users in the OSS development process (Chapter XXXV) and about the governance of open source-code repositories (Chapter XXXVII).

Section VI, on the other hand, focuses on businesses and applications involving OSS, that is, it leaves the state sphere behind and approaches the relations between OSS and the production sector. Although OSS

is considered - in its mythical representation as the not-for-profit product of a community of voluntary collaborators – an antithesis to the market, OSS development is nowadays often deeply intertwined with the activities of several private companies. These companies contribute to the development of OSS projects (Chapter XXXVIII), and may adopt various business models to make this a profitable interrelation (Chapter XL, XLII, XLV, XLVI). The relations between OSS and the market involves the investment of risk capital in OSS-based companies (Chapter XLI), and in the use of OSS products and methods in the corporate environment (XLIII, XLIV), and also involves the paradigm changes in the concept of client due to the core role taken on by the concept of community in OSS projects (Chapter XXXIX).

The seventh and last section is dedicated to OSS-related educational outlooks and practices. This section focuses mainly on the OSS use and deployment strategies for the infrastructure of schools and universities (Chapter XLVII, XLVIII, LI, LII), but also approaches the use of educational OSS and wikis in e-learning, in the learning of disciplines related to software development – Chapter LIV, XLIX, and LIII, respectively – and also the relation between OSS and the publication of open access (Chapter L).

Notes

1. For the sake of simplicity, the terms free software and open code software are used as synonyms. There are, however, connotation differences between the advocates of either term, as explained in Vainio and Vadén's article, Chapter 1-11. 