Open–Source and Public Sector Environmental Information Services

O

Asteris Masouras
Aristotle University of Thessaloniki, Greece

Kostas Karatzas
Aristotle University of Thessaloniki, Greece

INTRODUCTION

Free open/source software (FOSS) is a new software development paradigm that emerged in the last decade and relies directly on the volunteer efforts of geographically dispersed developers of varying professional affiliations and proficiencies, that are coordinated in ad-hoc schemes, based on recognition of the work carried out by relevant "core groups" of volunteers, and follow pragmatic directions, emerging from community feedback.

In direct contrast with previously established business practices (Raymond, 2000), this software development paradigm is fuelled by full disclosure of the source code, volunteer effort, and a number of "freedoms" granted to the software user regarding his ability to interact with the software and propagate its use.

By promoting code reuse and the adaptation of freely available best practices, FOSS development practices minimize redundancy and concentrate "investment" on innovation (Von Hippel & Von Krogh, 2003). The support FOSS projects receive, from the user-developer community, serves to provide guidance, reduce maintenance costs, and enhance software sustainability, while the service-oriented model of FOSS allows for a broad range of contractors to provide support, and helps in minimizing the total cost of ownership.

It is these characteristics FOSS, as we will demonstrate in this article, that render it flexible, economical and reusable, and thus appropriate for use in building publicly funded information and communication technology (ICT)

Table 1. Salient moments in FOSS history

1985	Richard Stallman creates Free Software Foundation and GNU project
1989	First version of the GNU General Purpose License; Berkeley CSRG releases TCP/IP code under proto-BSD license
1991	Linus Torvalds releases Linux kernel v0.01 to the public; Berkeley Net/2 distribution released, results in a lawsuit by UNIX owner AT&T against University of Berkeley and BSDI
1994	BSD lawsuit settled, 4.4BSD-Lite first legally Open Source Unix version; becomes starting point of all *BSD distributions
1997	"The Cathedral and the Bazaar" is published by Eric Raymond
1998	Netscape opens Navigator source; Open Source term is coined; Bruce Perens and Eric Raymond launch Open Source Initiative
1999	Apache Software Foundation formed

projects (Infonomics, 2002), especially those aiming at the dissemination of information to citizens, such as online environmental portals.

BACKGROUND

Free/Open Source Software: Definition and History

FOSS represents a software development paradigm, and as such, it is fairly new, compared to its precursors whose roots go back to the 50s and 70s. Historically, although the software model itself could be said to derive from the UNIX operating system, the FOSS development community, and underlying ideological movement is a little more than a decade old. Table 1 recaps some of the salient moments in FOSS history.

The FOSS development community consists of individuals, or groups of individuals, who contribute to a particular FOSS product or technology: as a consequence of the previous statement, this also includes the users of the software. Although referencing various forms of voluntary affiliation around FOSS projects, the community is the driving force of FOSS software development. It constitutes a community of practice (CoP) (Kimble, Hildreth, & Wright, 2001), and its motivations and processes have been recorded elsewhere in detail (Ghosh, 2003; Lerner & Tirole, 2001; Shah, 2003). CoP's are described as "intrinsic conditions for the existence of knowledge," (Lave & Wenger, 1991) attested to by the fact that the FOSS community provides fertile ground for user-consumer involvement in online joint innovation (Hemetsberger, 2003). The FOSS process refers to the approach for developing and maintaining FOSS products and technologies, including software, computers, devices, technical formats, and computer languages.

The terms open-source and free software refer to software developed and distributed on largely common principles. The definition of free software recognizes some fundamental freedoms as imparted by the author

Table 2. PSI in European legislation

1990	Dir. 90/313/EEC on public access to Environmental Information is adopted
1998	UNECE "Aarhus" Convention
1999	EU Green Paper on PSI is published
2000	eEurope 2002 Action Plan adopted
2001	"Aarhus" Convention enters into force
2002	Proposal on Directive for reuse of PSI
2003	eEurope 2005 Action Plan adopted
	Directives 2003/98/EC, 2003/4/EC, 2003/35/EC adopted
	WSIS Action Plan and financial support scheme adopted
2004	Proposal 2004/0175 on INSPIRE Directive adopted
2005	i2010: European Information Society 2010

(Stallman, 1999) to the user, inside a license agreement; namely the freedom to run, redistribute, study and improve, or adapt the program according to specific needs. The open source definition (Perens, 1998) further extended these principles and focused on the development process rather than the political ideology underlying the free software movement.

Unrestricted access to the software source code is a precondition for most of the aforementioned freedoms, and the usefulness and reuse potential of FOSS is dependent on the continual revision and adaptation of its source code. In proprietary and closed development environments, the frequency of revisions is dominated by the sales cycle but can also be stilled by managerial decree. In FOSS, the "life expectancy" of software, is a direct outcome of its popularity with developers, who will choose to devote time to improve functionality, and users, who will provide constant feedback to developers on needed improvements and fixes.

International and European Public Sector Information Policy Initiatives

The public sector information (PSI) sector represents a considerable part of the information production "market" and has been using non-negligible funds to support this production, in order to serve the public, while supporting authorities and various decision-making bodies in their administrative tasks: PSI is an important component of the content market and a key economic resource for commercial exploitation. The size of the European content industry is some 433 billion euro, about 5% of European GDP. It is estimated that 12% to 25% of the data used in e-Commerce is sourced from PSI. PSI is therefore a prime content resource (Davies, 2005), while Environmental Information accounts for a considerable percentage of PSI produced (> 50%). This information corpus, produced on the basis of various legislative mandates, is usually disposed to a physical or electronic archive, which is rarely revisited and re-used, although it represents a considerable public investment. By the introduction of online services (e-government, e-health, e-learning, etc.), governments promote the public interest for enhanced

efficiency and effectiveness (European Commission, 2004) and become themselves important suppliers and users of ICT's, thereby influencing their take up.

Within the EU, a variety of important policy initiatives have been undertaken towards the development of a framework for the definition, access and usage of PSI, Environmental Information being the most prominent and massive part of the PSI corpus. The most important of these initiatives are listed in Table 2, while some of them are presented in detail hereafter.

World Summit on the Information Society 2003 Action Plan

The objectives of the World Summit on the Information Society Plan of Action (World Summit on the Information Society, 2003) are "to build an inclusive Information Society; to put the potential of knowledge and ICTs at the service of development; to promote the use of information and knowledge for the achievement of internationally agreed development goals, including those contained in the Millennium Declaration; and to address new challenges of the Information Society, at the national, regional and international levels." To this end, the Action Plan calls on governments to take action, in the framework of national development policies, in order to support an enabling and competitive environment for the necessary investment in ICT infrastructure and for the development of new services. Measures to that direction include establishing legislation on access to information and the preservation of public data; instituting policy guidelines for the development and promotion of public domain information as an important international instrument promoting public access to information; creation of digital public libraries and community public access points; facilitating access to journals and books, with special care taken to promote accessibility for all, including disadvantaged, marginalized and vulnerable groups, and using affordable technologies and non-text based computer interfaces.

Although the WSIS action plan does not explicitly mention FOSS as a key element in developing an "information society for all," its potential in reinforcing the policies proposed in the Action Plan is underscored in a variety of its articles, as well as stated directly in peripheral texts, such as the Tokyo Declaration (UNESCAP, 2003), which declared that "development and deployment of open-source software should be encouraged, as appropriate, as should open standards for ICT networking."

eEurope 2002 and 2005 Action Plans

The central message of the eEurope 2002 Action Plan (European Parliament, 2002) was that the digital, knowl-

7 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/open-source-public-sector-environmental/11670

Related Content

Translucent States: Political Mediation of E-Transparency
Maria Frick (2008). *International Journal of Electronic Government Research (pp. 81-102).*
www.irma-international.org/article/translucent-states-political-mediation-transparency/2056

Interoperability in Electronic Government: The Case of Police Investigations
Petter Gottschalk (2009). *International Journal of Electronic Government Research (pp. 14-27).*
www.irma-international.org/article/interoperability-electronic-government/37440

Computer-Assisted E-Customs Transactions: Proposing a System to Support Small and Medium-Sized Enterprises in Electronically Declaring International Exports
Julian Krumeich, Timo Bredehöft, Dirk Werthand Peter Loos (2015). *International Journal of Electronic Government Research (pp. 21-38).*
www.irma-international.org/article/computer-assisted-e-customs-transactions/126349

Success Stories of ICT Implementation in Saudi Arabia
Saira Muzafarand N. Z. Jhanjhi (2020). *Employing Recent Technologies for Improved Digital Governance (pp. 151-163).*
www.irma-international.org/chapter/success-stories-of-ict-implementation-in-saudi-arabia/245980

Impact of Performance Expectancy, Effort Expectancy, and Citizen Trust on the Adoption of Electronic Voting System in Ghana
Isaac Kofi Mensah (2020). *International Journal of Electronic Government Research (pp. 19-32).*
www.irma-international.org/article/impact-of-performance-expectancy-effort-expectancy-and-citizen-trust-on-the-adoption-of-electronic-voting-system-in-ghana/267138