Exploiting the Collaboration between Open Source Developers and Research

Giancarlo Succi, Paolo Zuliani

Centre for Applied Software Engineering, Free University of Bolzano-Bozen
piazza Domenicani 3, 39100 Bolzano-Bozen, Italy
{giancarlo.succi, paolo.zuliani}@unibz.it

Abstract

In this paper it is argued that open source developers and research projects carrying out user requirement analysis should collaborate at a closer level. In particular, we discuss how developers could take advantage of the knowledge generated by COSPA, a research project aimed at studying and supporting the introduction of open source software in the Public Administration. COSPA focuses on office automation and desktop system software and it could thus provide developers with user requirements from one of the main "corporate" users of software. To this aim, the project has established an "observer" status, by means of which interested parties may access COSPA's results, thereby fostering collaboration and increasing dissemination of knowledge.

1. Introduction

Open Source Software (OSS) has grown a lot in popularity. Linux and the Apache web server are found in respectively 30% and 66% of the Internet's public servers, according to Netcraft's survey [1]. We thus have some empirical evidence that OSS can work well, at least for the server side of the client-server architecture. On the other had, it seems that OSS is not well suited for desktop and client applications, for which we know that Microsoft Office is the *de-facto* standard. The FLOSS study [3] showed that only 8% of business and public institutions use some kind of OS desktop software. If we consider office automation tools only, the percentage drops to a mere 4%.

Why such a difference, with respect to system software? Some authors suggest that it might be due to the fact that developers of OS system software "*knew what they were doing and how to do it*" [6]. In the case of Linux, the group of developers headed by Torvalds had a clear idea of the *requirements* of the system being developed, plus they all shared knowledge of the Unix structure [7]. Indeed, research in software engineering has clearly proved the importance and impact of requirements in software development [8]. In the case of OSS, requirements elicitation and sharing is an even more critical activity, as development teams are usually geographically distributed.

Another reason for the difference in popularity between desktop and system OSS is the fact that the former is actually much younger, and therefore it has not benefited from the same amount of user testing and feedback as OS system software has had. However, it looks nonetheless very important that desktop OSS exploits and incorporates user requirements as soon as possible, in order to develop products grounded on users' expectations. At the moment it is not clear how user needs are taken into account by OS developers.

In this paper it is argued that open source developers and research projects carrying out user requirement analysis should collaborate at a closer level. In particular, we make the case for a close interaction between OSS desktop developers and the COSPA research project. COSPA studies the introduction of OS desktop software in the Public Administration and could therefore provide the OS developers community with valuable information about the requirements of a "corporate" sector.

2. The COSPA project

The Consortium aims at introducing, analysing, and supporting the use of Open Data Standards (ODS) and Open Source (OS) software for personal productivity and document management in European Public Administrations (PA).

The Consortium will analyse and support the introduction of ODS and OS solutions in the PA by:
- Deploying ODS and OS software solutions in several European PAs, and benchmarking their effectiveness through a cost/benefit analysis;
- Building a European, multilingual, freely-accessible knowledge and experience base by comparing and pooling knowledge;
- Disseminating the results and the experiences of the study through a series of workshops at regional and European level.

In particular, the project focuses on the OpenOffice suite: a set of key desktop applications which includes a word processor, a spreadsheet, a presentation manager, a drawing program, and an equation editor [4].

COSPA is funded by the 6th Framework Programme (FP6) of the European Union and will run from January 2004 to December 2005.

2.1 The Consortium

COSPA is a consortium of fifteen European partners:

- **Academia**: Free University of Bolzano-Bozen (Italy, Coordinator), Computer and Automation Research Institute MTA-SZTAKI (Hungary), University of Aalborg (Denmark), University of Limerick (Ireland), University of Sheffield (UK);

- **Public Administrations**: Consortium of the Municipalities of the Province of Bolzano-Bozen (Italy), Torokbalint City Council (Hungary), Hanstholm Kommune (Denmark), Society of IT Management (UK), Beaumont Hospital (Ireland), South-West Regional Authority (Ireland), Province of Pisa (Italy), Province of Genova (Italy);

- **Industry**: Conecta srl (Italy), IBM Belgium SA (Belgium).

The structure of the Consortium is centered on university-PA couples. In fact, every PA is co-located with an academic partner, in order to constantly follow the evolution of the transition to OSS.

2.2 Workplan

The Consortium will introduce, analyse, and support the introduction in the PA of OSS and ODS. The workplan of the project can be divided in five main activities:

1) gathering and analysis of user requirements from the partner PAs, in order to devise possible OS solutions. The focus of this task is not to develop brand new applications, but rather to identify and combine OS software and ODS which fulfill the PA requirements;

2) pilot projects for deploying in the partner PAs the OS desktop solutions developed on the basis of the previous requirement study, in order to enable the subsequent cost/benefit analysis. Deployment will follow a two-step strategy: in the first step we focus on desktop applications only (mainly OpenOffice). In the second step we will also deal with desktop operating systems (Linux);

3) benchmarking of the deployed OS solutions, through a statistical and cost/benefit analysis. Financial, economic, reliability, effort, cost, and time aspects will be considered and integrated;

4) building a European knowledge and experience repository by comparing and pooling knowledge acquired in the previous phases of the project. The knowledge base will be placed on the Internet and made freely accessible;

5) dissemination of the results and the experiences of the project through the knowledge base and a series of workshops at regional and European level, with the aim of stimulate:
   o the exchange and sharing of knowledge among the partners of the Consortium;
   o public and business' awareness on the project and on OS in general;
   o interaction between users and OS developers communities.

3. Synergy with developers' community

The activities which might be of interest to OSS developers are mainly two:

- analysis of requirements for OSS/ODS in the PA (activity 1); and

- pilot projects introducing OSS in the PA (activities 2, 3).

3.1 Requirement collection and analysis

This activity aims at finding out what OSS can be used, why and what problems have been experienced in adopting/managing it, what parts of an application are actually used, what parts are too sophisticated or inappropriate for the PA, what critical PA applications use OSS. Various requirement gathering techniques will be used, including questionnaires, interviews, development of user stories, and so on.

Developers might benefit from the knowledge acquired in this phase of the project by checking how their applications are used in a corporate environment. Of course, developers may also consider PA's requirements as a driver for further evolution of their projects.

Work in this activity might possibly include the development of *ad-hoc* tools which will enable the successful integration of OS desktop software in existing PA environments. In particular, such tools would be expected to address interoperability issues between legacy databases and desktop applications. This could result in a direct involvement of the OS developers community. For example, a project's partner has already tackled this issue by developing a library for "bridging" Oracle databases with OpenOffice. Such library is expected to be released to the OS community.

3.1 Pilot projects

The objective of this activity is to run experiments on the introduction of OSS in the partner PAs, and to benchmark the effectiveness of the deployed OS solutions through a statistical and cost/benefit analysis. The analysis will consider financial, economic, reliability, effort, cost, and time aspects. The deployed OS solutions will of course be chosen on the basis of the previous requirement analysis.

Data on usage and satisfaction will be collected in the partner PAs by the universities, both manually and automatically. The automatic data collection of process and product metrics [5][9] is carried out using the PROM tool [10]. The data collected will form the core data source for the analysis of the effort required in the transition to OS.

The results of the pilot project phase would be of great interest to developers, as they could check how their applications and tools perform in a corporate environment. The analysis could identify strengths and weaknesses of OSS, bugs, security pitfalls, etc.

4. Observers

In order to increase dissemination of knowledge and to promote best practices in Public Administrations, the Consortium has established the role of *observer*. An observer can access the project's results and experiences in a privileged way. It may also attend project meetings and thus give useful advises on the implementation of the project itself.

At the time of writing COSPA has the following observers:

- University of Alberta, Canada;
- Victoria University of Wellington, New Zealand;
- UNESCO.

New observers may join COSPA at any time. On the project's website [2] it is available the application form for becoming a COSPA observer.

Other research projects involved in OS could well foresee and equivalent observer role, in order to foster collaboration with developer communities and spread knowledge.

5. Conclusions

Successful OSS seems to be so far confined in the system software area, of which Linux, Apache and Sendmail are notable examples. Desktop OSS does not share the same amount of popularity. We argued that this might be due to the fact that OS developers do not have access to user requirements: for example, Linux developers knew exactly what they needed in the system and knew how to do it. On the other hand, it seems that developers of desktop OSS are not in the same situation. In this paper we make the case for a close interaction between OSS desktop developers and the COSPA research project. COSPA studies the introduction of OS desktop software in the Public Administration and could therefore provide the OS developers community with valuable information about the requirements of a "corporate" sector. That might clearly help and guide the development of useful and user-friendly desktop applications.

6. References

[1] Netcraft Survey, http://www.netcraft.com/survey/
[2] http://www.cospa-project.org
[3] Free/Libre/Open Source Software: Survey and Study. June 2002. http://www.infonomics.nl/FLOSS/
[4] The OpenOffice project, http://www.openoffice.org
[5] W. Humprey, *Introduction to the Personal Software Process*, Addison-Wesley, 1997.
[6] A. Fuggetta, "Open source software - an evaluation", *Journal of Systems and Software*, 66 (2003), 77-90.
[7] E.S. Raymond, *The Cathredal & the Bazaar,* O'Reilly, 2001.
[8] R.S. Pressman, *Software Engineering: A Practitioner's Approach,* 6th ed, McGraw-Hill, 2004.
[9] N.E. Fenton and S.H. Pfleeger, *Software Metrics: a Rigorous and Practical Approach,* Thomson Computer Press, 1994.
[10] A. Sillitti, A. Janes, G. Succi, T. Vernazza, "Collecting, Integrating and Analyzing Software Metrics and Personal Software Process Data", *Proceedings of EUROMICRO '03*, 336-342.