Evaluation of FLOSS by Analyzing Its Software Evolution: An Example using the Moodle Platform

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ABSTRACT

In today’s world, management often rely on FLOSS (Free/Libre/Open Source Software) systems to run their organizations. However, the nature of FLOSS is different from the software they have been using in the last decades. Its development model is distributed, and its authors are diverse as many volunteers and companies may collaborate in the project. In this paper, the authors want to shed some light on how to evaluate a FLOSS system by looking at the Moodle platform, which is currently the most used learning management system among educational institutions worldwide. In contrast with other evaluation models that have been proposed so far, the one presented here is based on retrieving historical information that can be obtained publicly from the Internet, allowing the authors to study its evolution. As a result, they will show how using their methodology management can take informed decisions that lower the risk that organizations face when investing in a FLOSS system.

Keywords: Free Software, LMS, Moodle, Open Source, Software Engineering, Software Evaluation, Software Evolution

INTRODUCTION

Free/Libre/Open Source Software (FLOSS) has gained wide acceptance in today’s technological field, and the number of organizations that consider it has grown significantly (Ven, Verelst, & Mannaert, 2008), to the point that many software-intensive organizations have adopted it for tasks that could be considered their core business (Hauge, Ayala, & Conradi, 2010).

Although most FLOSS projects follow an open development model, where transparency allows to take the pulse of the project, managers still are suspicious of a distributed model where seldom a single entity governs the project—as it happens in the proprietary domain, where a software belongs to only one vendor. In recent years, a myriad of models have been proposed to provide managers the tools to perform informed decisions when adopting...
FLOSS (Groven, Haaland, Glott, Tannenberg, & Darbousset-Chong, 2012). These models take advantage of the availability of public data of the projects, offering the possibility to perform a structured analysis that takes into consideration the requirements of the organization.

However, these models offer in general a limited perspective of the project as they try to summarize some of the current attributes or characteristics of the projects into a single parameter, usually a final mark that allows managers to rank all possible solutions according to how suitable they are for their organization. In this paper, we argue that the evolution over time of many of these attributes and characteristics provide a wider perspective and allow to have a more detailed view of the project(s) under study. The goal therefore is to show, with the help of a case study (the Moodle learning management system), that software evolution aspects should be taken into consideration when analyzing a FLOSS project for its adoption.

The structure of this paper is as follows: in the next section, related research on evaluation of FLOSS projects is presented. METHODLOGY introduces the proposed methodology for evaluating a FLOSS software from a software evolution point of view. Then, the case study is presented, together with the tools used to apply the methodology on it. RESULTS offers the results of using the aforementioned methodology to our case study, Moodle. Finally, conclusions are drawn.

RELATED RESEARCH

This section introduces research and proposals related to the evaluation of FLOSS projects. Several FLOSS evaluation frameworks exist. We will present OpenBRR™, one of the first FLOSS assessment models and undoubtedly the most known one, whose philosophy sums up many of the characteristics that are common to most of the evaluation frameworks.

OpenBRR™

The Business Readiness Rating (OpenBRR™) is a model based on the identification of functional evaluation criteria for the software under study. These criteria are supposed to be extracted from the project repositories with the help of automated tools and available for the evaluators in form of a spreadsheet that groups them according to several aspects. A final step allows evaluators to specify different weights to the aspects, in accordance to their subjective importance for adoption, and to obtain a final mark for the project, which can be compared to other FLOSS projects. Figure 1(a) offers a graphical perspective of the model: normalized metrics are obtained from the FLOSS project, which are weighted to provide an intermediate rating to a set of predefined categories that range from functionality to usability. These ratings are used (provided that they are weighted according to their importance for the evaluating organization) to obtain a global rating. Ratings range from 1 (unacceptable) to 5 (excellent). Figure 1(b) shows how its proponents have conceived that the model should be used. They have identified in total four different phases. In a first one, all projects of a given domain are quickly assessed, so that the ones that most likely seem not to be suitable for the organization are filtered out. This step avoids having to perform the rest of phases, which may be costly in time and resources. Then, the target usage should be considered, as this will result in values for the weights in the model. By means of tools, data on the candidate FLOSS projects is to be collected and processed in a third phase. The last phase transforms the collected data to the various category ratings in the model, and finally to the final rating. An example of the use of OpenBRR™ on a FLOSS business intelligence suite can be found in (Marinheiro & Bernardino, 2013).

OpenBRR™ has served as basis for many other research efforts. Germán et al. discuss the challenges of automating the process to
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