A comparison of Free Software Web Portals♦

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Abstract. *One of the requirements for a given software system to be considered Free Software is to make its source code widely available to the user community. An efficient way of doing so is by hosting the system into a web portal. There are several portals that address this issue, offering free hosting to free software (and/or open source) projects. In this paper, we analyze some of the existing portals and evaluate them according to a set of prior established items. The goal of this analysis is to help users to choose the portal that best fits his projects' needs.*

1. Introduction

When developing Free Software, one needs to assure that the "freedoms" that characterize Free Software are being accomplished. One of those freedoms refers to "the freedom of studying and adapting the code according to the user needs" (FREE SOFTWARE FOUNDATION, 1996; ANSOL, 2002). This implies the user has access to the source code.

To fulfill this requirement, most Free Software developers use Web Portals to make source code widely available to the user community. Besides giving access to the source code of several projects, these portals also offer tools to help the development of the projects they host. Among such tools, we can cite task management tools, bug trackers, forums, mailing lists, tools to support feature requests, version control servers, and others.

The different portals offer different advantages to the projects they host. In most of the cases, it is difficult for the developer to choose the one which best fits his needs. In this paper, we analyze seven of such portals and compare them in terms of the services they offer. The analyzed portals are: Source Forge (OPEN SOURCE TECHNOLOGY GROUP, 2005), Apache (APACHE SOFTWARE FOUNDATION, 2005), Tigris (TIGRIS, 2005), ObjectWeb (OBJECT WEB CONSORTIUM, 2005), Savannah (FREE SOFTWARE FOUNDATION, 2000), Código Livre (a Brazilian portal) (UNIVATES, 2000) and Java.net (SUN MICROSYSTEMS, 1995). The main

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goal of this comparison is to help developers in the choice of a portal to host their projects.

The remaining of this paper is structured as follows. Section 2 discusses the methodology we have used in this study and Section 3 shows details of the analyzed portals. Finally, Section 4 compares the portals and concludes.

2. Methodology

The analyzed portals have public and private areas. In many of the cases, the details on how the portals work are in the private areas. Because of that, we have created a new user for each of the analyzed portals, so that we could have access to the private areas.

Once in the private areas, we have analyzed the steps to the creation of a new project. The steps were followed until the end, but the creation of the project was not confirmed. This is because we had to use "fake" data in the creation process, once we did not have a real project to submit. Also, every portal analyzes the requests of new projects, and the project is only hosted after being approved by the portal.

The need of approval avoids "fake" projects to be created (like the one we would like to create for this analysis), but unfortunately, it had also prevented us of having more data to conduct this comparison. Due to that restriction, we could not access the private area of the projects. The only restricted area we had access to was the user private area. To try to overcome this problem, we have looked at the public areas of existing projects in each portal. This was important to recognize parts and tools that could be hidden to external users.

However, in some cases, these steps – plus the analysis of available documentation – were not enough to provide answers to all of the analyzed items. In such cases, the comparison table of Section 4 shows a question mark (?).

It is important to notice that most of the portals we have studied are Open Source portals, and not Free Software portals. However, the goals of the Free Software and Open Source community are quite similar (FREE SOFTWARE FOUNDATION, 1996), and Open Source portals can host Free Software as well.

For each of the portals, we have investigated the support they give for the following issues: (1) Project registration: what are the requirements for the registration of a new project on the portal?; (2) Version control: does the portal offer version control systems?; (3) Forum: does it offer forums?; (4) Mailing lists: are mailing lists available?; (5) Project Web Page: does the portal supply a web page for the project?; (6) Bugs: does it offer bug tracking?; (7) Documentation: does it have tools to support the documentation of the project?; (8) Intellectual Property: does the portal preserve the intellectual property to the projects owner?; (9) Support: does it require the developers to provide support even after the project is finished?; (10) Task Management: does it have tools to support task management?; (11) Backup: does it provide automatic backups of the repositories in the version control system?; (12) Customization of public area: does it allow the developer to customize the public area (remove unwanted items from the public view)?

3. Web Portals

In the following sections, we present an overview of each of the analyzed portals, and try to identify whether they supply the above items or not. However, we first present an overview of the common features of the analyzed sites.

As mentioned before, all of the seven portals require that the project be approved before it can be hosted on the portal. Some have more complicated registration steps than others, but all of them require that the license over which the (future) resulting source code will be distributed be chosen at project registration time. It is usually possible to choose one of the standard licenses approved by OSTG such as GPL, LGPL, BSD, MIT, MPL, among others (http://opensource.org/licenses). It is also possible to specify a new license, but this usually increases the evaluation time of the submitted project, since the license needs to be studied to check if it does not violate the Open Source definition. The ObjectWeb portal is an exception: it requires the projects to choose the LGPL license – in only very special situations projects are allowed to break this requirement.

Also, they do not require that the developers have already a source code to make available to the users. In fact, the goal of these portals is to support the development of Open Source Software, so it is understandable that projects start with no source code at all.

Additionally, in all of the portals, only registered users can submit hosting requests for a project. The information required for the user registration is usually name, valid e-mail address (a confirmation message needs to be replied in order to finish the user registration process), and a password that will be used to access the portal. Some of the portals let users choose a login name; others automatically generate one from the user's name and last name.

Regarding the version control systems, all of the portals offer servers that can be used by the developers. Besides, they provide read-only anonymous access to outside users. In this way, a user can do anonymous check-outs in the repositories of any project hosted at the portals. Some of the portals, however, provide ways of blocking such external access.

3.1. Source Forge

Source Forge (www.sourceforge.net) is one of the world biggest Open Source development site. It hosts thousands of projects from several different countries. The main goal of this portal is to offer a centralized place where developers can control and manage the development of Open Source software (OPEN SOURCE TECHNOLOGY GROUP, 2005).

To register a new project in the portal, it is necessary to determine the type of project (software, documentation, web site, peer-to-peer software, game, content management system, operational system distribution, pre-compiled package of existing software, software internationalization). After this, it is necessary to go through a term agreement step, followed by providing a description of the project and choosing the project name. The registration process is quite simple and fast. Once registered, Source Forge will take about 2 days to approve or reject the request.

After approval, the project can start taking advantage of the benefits offered by Source Forge: forums, CVS, mailing lists (public or private), project web page, documentation (DocManager), task management, automatic backup of the version control repository, and trackers for bugs, support requests, features requests and patches. All of these tools can be configured to be visible or hidden to external users. This means that if necessary, they can be completely removed from public view, including removal of external access to the CVS repository.

It is also possible to request help from external developers. Source Forge provides a way for projects to specify the skills they want on contributors (testers, interface developers, etc.). Such contributors can then be included in the project development team.

3.2. Apache

The Apache (www.apache.org) portal is maintained by the Apache Software Foundation. The main issue regarding this portal is the loss of intellectual property. The projects hosted at Apache must be donated to the Apache Foundation, and the Foundation gets the responsibility of deciding how the project should be developed.

Projects wanting to be hosted at Apache are submitted through the "Apache Incubator" project. The Incubator is responsible to inform how the Foundation works and what paths the submitted project will follow, until the project is mature enough to become an official project of the Apache Foundation (or die before that).

The Apache Foundation has an internal organization that affects the project submission procedure. As mentioned before, the submission must be done through the Incubator Project. However, the submission is not as easy as that. To be able to start the submission, the project must (APACHE SOFTWARE FOUNDATION, 2005):

- Be indicated for incubation by one member of the Apache Foundation; and
- Be approved by a sponsor

The sponsor can be one of the following:

- The Board of Directors of the Apache Foundation;
- A top level project (TPL) within the Apache Foundation. In this case, the new project should be a subproject of the TPL;
- The board of the Incubator Project (which is responsible for accepting new projects)

To initiate the hosting request process, a proposal must be submitted to the chosen sponsor. The proposal must have a minimal of information about the project. After being approved, the project is hosted under the Incubator Project.

The Apache portal offers a version control system (CVS or Subversion), mailing lists (which can be exclusive for the project or in conjunction with the Incubator Project), Web page, documentation (Apache Forrest), bug tracking and task management.

3.3. Tigris

Tigris (www.tigris.org) is an Open Source community focused on building tools for collaborative software development (TIGRIS, 2005). It only hosts projects related to its mission: developing tools to support collaborative development. Because of this, the project must fit in one of the following categories: construction, deployment, design, issue track, libraries, personal, process, profession, requirements, SCM, students, techcomm and testing.

The only requirement for the registration of a new project is that it falls into one of the above categories, and that it is a collaborative software development tool.

Tigris offers the following advantages to the projects it hosts: mailing lists, task management, bug tracking, Web page for the project, news, CVS or Subversion and forums.

3.4. ObjectWeb

ObjectWeb (www.objectweb.org) is a consortium created in 1999 to promote the development of open source software (OBJECT WEB CONSORTIUM, 2005). It is maintained by INRIA, and hosts projects such as Active XML, C-JDBC, JoNaS, among others. The consortium is composed by a hierarchy (EMMANUEL CECCHET *et al.*, 2004):

- *The Board* is comprised of representatives from individuals and companies which are members of the consortium. The board is responsible for the policies, strategies and direction of the consortium. The Executive Committee is in charge of the daily operations.
- *The College of Architects* is comprised of individuals chosen by their expertise and abilities. It is responsible for technically orienting the consortium; leading the development of the ObjectWeb code base; evolution and architectural integrity of the code base; and by the approval of new projects.

Projects on ObjectWeb must fit into one of the following categories: communications, database, desktop environment, education, games/entertainment, internet, multimedia, office/business, other/nonlisted topic, printing, religion, scientific/engineering, security, software development, system, terminals and text editors.

In order to be hosted at ObjectWeb, the result of the project must be a middleware component that can be reused by a great variety of software platforms and application domains. Besides, the project must participate in the discussions of the evolution of the code base of ObjectWeb; participate in the definition of this evolution; and apply the architectural principles and frameworks provided by ObjectWeb to maximize the reuse of the project's source code.

The registration process of new projects in ObjectWeb is rather complex. Detailed information about the project is required, including synergies with the projects already hosted by ObjectWeb, internationalization issues, description of similar projects, project team and support, user community, technologies and standards implemented, among others. The list of requirements is much like a formal project submission.

Additionally, there is a restriction regarding the license of the project. The LGPL is the recommended license, and a different license is accepted only in very special cases.

ObjectWeb offers several advantages to the projects it hosts. Among them, we can cite: CVS, web page, forum, mailing list, task management, backup and trackers for bugs, support requests, patches and feature requests.

In a similar way of Source Forge, ObjectWeb also allows projects to request help from external developers.

3.5. Savannah

The Savannah portal (http://savannah.gnu.org) hosts projects that fall into one of the following four categories: software project, documentation project, free educational book, FSF/GNU Project (FREE SOFTWARE FOUNDATION, 2000). Non GNU projects are hosted at http://savannah.nongnu.org, but the functionalities of both portals are the same.

The registration process of a new project requires a detailed description of the project. Required information includes a URL of the source code (if any) and a list of libraries used in the source code (to make sure no non-free library is used).

Savannah offers a smaller list of advantages to its users, if compared with other portals: CVS, web page, mailing list, bug tracking, support requests management and task management. However, the site does not clearly define whether it is possible to hide some of these functionalities from external users.

Help from external developers can be achieved by a process similar to the ones in Source Forge and ObjectWeb.

3.6. Código Livre

Código Livre (http://codigolivre.org.br) is a Brazilian portal intended to support the development of Free Software in Brazil (UNIVATES, 2000). Its creation was an initiative of UNIVATES (a University in the south of Brazil) and nowadays it is hosted in Campinas, supported by UNICAMP. The portal is also supported by Source Forge.

To register a new project, the following information needs to be provided: a detailed description of the project and its goals and the category in which it falls (desktop environment, databases, communication, software development, text editor, education, printing, internet, games/entertainment, multimedia, office/business, other/non-listed, religion, scientific/engineering, security, system, terminal). Notice that this category list is exactly the same as the one in ObjectWeb. They both use a software provided by Source Forge.

The advantages offered by Código Livre to the projects it hosts are: CVS, mailing lists, bug tracking, forums, task management, web page, backup and documentation. Código Livre allows the developers to hide these tools from external users. Additionally, Código Livre allows requesting help of external developers in the same way as Source Forge and ObjectWeb.

The main disadvantage of this portal is the fact that it is in Portuguese. This restricts the international visibility of projects hosted there, and also forbids non-Portuguese speakers of hosting projects there.

3.7. Java.net

Java.net (www.java.net) is a portal that hosts Java projects. It accepts projects with no source code under an "Incubator" project. Projects are graduated when they release source code.

In order to register a project on Java.net, it is necessary to inform the project goals and description, contact information, choose a community (Embedded Java, Global Education and Learning Community, Java Communications, Java Distributed Data Acquisition and Control, Java Enterprise, Java Games, Java Patterns, Java Specification Requests, Java Tools, Java User Groups, Java Web Services and XML, Java Desktop, JXTA, Linux, Mac Java Community and Portlet), topics related to the project and a category.

The tools provided by Java.net are the following: CVS, file sharing, discussion forums, issue tracking, mailing lists, news postings, event postings, weblog and wiki. During project registration, it is possible to choose the tools that will be used by the project. Additionally, Java.net offers a "help wanted" section, to allow projects to request help from external users.

4. Comparison and Conclusion

In this section, we present a comparison of the analyzed portals. The criteria for this comparison were specified in Section 2. Table 1 summarizes the comparison. As mentioned before, a question mark (?) indicates that there was not enough information to evaluate the item.

Only in Source Forge and ObjectWeb it is clear that there is no need of offering support after the termination of the project. However, there are clues that make us believe that the remaining portals also do not make this requirement. As an example, Código Livre allows projects to be removed from the portal. The removal is not complete though. All the public information of the project prior to removal remains in the portal (file releases (if any), CVS history, forums, etc.).

Intellectual property is another important issue. All of the portals (except for Apache) preserve the intellectual property to the project owner.

Portals that offer the major number of advantages are Source Forge, Código Livre and Object Web. Código Livre, however, has only local visibility because it is in Portuguese. Object Web has also a limitation regarding the license of the project: LGPL must be chosen. It is also not clear if it is possible to personalize the project page to remove tools from public view (such as CVS). Another issue to be considered in ObjectWeb is the complex process registration. Nevertheless, ObjectWeb has a very good reputation in academia. Projects hosted there are known to have excellent quality.

This study has shown the large amount of options for project hosting, and the pros and cons of each portal. It is part a Free Software development project, Pargres

(MATTOSO *et al.*) financed by FINEP/Itautec. We hope it will help developers in the choice of a portal for their projects.

Table 1. Comparison of the portals

	Source Forge	Apache	Tigris	ObjectWeb	Savannah	Código Livre	Java.net
Version Control	V	V	V	V	V	V	V
Remove CVS from public access	V	V	?	?	?	V	?
Forum	V	×	V	V	×	V	V
Mailing Lists	V	V	V	V	V	V	V
Web Page	V	V	V	V	V	V	V
Bug Tracking	V	V	V	V	V	V	V
Documentation	V	V	×	V	×	V	×
Intellectual Property	owner	Apache Foundation	owner	owner	owner	owner	owner
Support after project termination	V	×	?	V	?	V	?
Task Management	V	V	V	V	V	V	V
Backup	V	?	?	V	×	V	×
Restrictions regarding the project	Catego-ries	Find a sponsor	Collaborative software development tool	Formal submission process, LGPL	Categories	Categories	Java project, Categories

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