FOSS: Challenges and Opportunities

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ABSTRACT -

The Free Open Source Software (FOSS) makes source code available to users, who can change the software to tailor it more closely to their own requirements. Open-source software is becoming a gradually more popular as a software development method. Open source software's viewed by many as being very good in terms of their usage, reliability, performance and market share. Mostly open source software developer focus on functionality and different feature of the software; on the other hand they ignore the user centric design requirement.

Free Open Source Software (FOSS) is being suggested as a solution to a lot of computing problems, like FOSS migration. The challenges include usability, software development service, support, inter-operability and integration, security and data migration, human factors and local language support.

In the mainstream adoption of FOSS, distribution editors play a crucial role: they package, integrate and distribute a wide variety of software, written in a variety of languages, for a variety of purposes of unprecedented breadth.

Ensuring the quality of a FOSS distribution is a technical and engineering challenge, due to the size and complexity of these distributions.

Every challenge in the world creates an opportunity for the others. With this, the limitations with available FOSS and the bugs, new communities or peoples get opportunity to resolve the problem and contribute to the community.

Index Terms—FOSS, Opportunities, challenges, data migration, security, training, skilled persons

I. INTRODUCTION

Free Open Source Software (FOSS) is software whose source code is publicly available, usually developed by a community of volunteers. The Open and Free software movement formally started in 1983 with the GNU Project, the philosophy behind the project was to give the user complete freedom to use, modify and redistribute the software, this was embodied by the GNU General Public License.

The collaborative production of free software has been held upon by the culture and other creative communities, where collaborative development models from free software do work well, such as discussion groups and online information sources. Wikipedia is a great example of this. But most other domains of production, including pharmaceuticals, have tangible physical output even if they are based on some form of intellectual creativity and cannot fully benefit from the problem of infinity that resulted in the free software solution.

SourceForge.net (http://sourceforge.net/), owned by the Open Source Development Network, Inc. (OSDN), provides a repository for open source software projects. An online database of registered projects, called the Trove, allows people to search by keyword, as well as by development status, intended audience, platform, license, programming language, interface language, and software category. SourceForge.net also provides a range of other services to open source communities, including project web space, mailing list and discussion forums, and software release management tools.

To examine the migration challenges with FOSS, enterprises deploy both proprietary and open-source software in heterogeneous IT environments: in which proprietary and open-source software developers are use each other's software development, licensing and business models. The IT world has no longer world in which customers and vendors choose to be either proprietary or open source. Instead, it is an attractive world as the lines between proprietary and open source have been blurred, making inter-operable deployments almost inevitable in many cases.

Security Concerns in using Open Source Software for Enterprise Requirements, the FOSS development model gives a new option to the organisations for acquiring and implementing systems, as well as new opportunities for participating in FOSS projects.

II. CHALLENGES IN FOSS

As the open source makes the source code available to the public, most of the popular open source software is normally maintained by an association which consists of a group of individuals and/or organizations dedicated to further enhance and maintain them. The efforts of such an association would typically be supported by grants from generous sponsors which could be individuals or organizations.

If the open source product is not very popular (not widely deployed) or it is not well sponsored, it may become difficult for getting patches for the discovered vulnerabilities. The organizations using such an open source might not always have enough expertise available in-house to fix the bugs and develop patches for themselves

Because of the source code is available, even amateurs could easily design and distribute some malware by embedding malicious code into the original open source distribution. They could then show off some exciting features in their malware attracting some innocent end users.

In a lot of countries the official language is not English and it is a challenge for the government to implement IT systems that can support these different languages, but with FOSS, that can be achieved as local developers can be used to translate different FOSS applications into local languages. The challenge is in creating and fostering local FOSS communities. The challenges can be summarized as:

- Overcoming the communication barrier between local developers and the FOSS community at large because usually information is distributed between the FAQ list, bug reports and patches.
- Informing the potential local users and the public sector about the local FOSS community.
- Setting up user profiles and requirements by trying to investigate the local user base.

FOSS suppliers will offer different licenses to meet the needs of different customers ranging from personal user to IT or commercial software provider. It is important to understand the various FOSS license options and to have a clear policy articulated for in an organization. Typically open source applications are available “free-of-charge”, but the potential for hidden costs has slowed down their acceptance in commercial settings. This licensing has an impact of open source software and the Open Source Initiative approved licenses on commercial applications, and both the legal and illegal trading of software.

User-centered design and other methods that in software development that produce user-friendly software are usually not used in FOSS development. The government sector is increasingly requiring general and customized software for public administrations. If governments start using and developing FOSS applications, the message to the market is that FOSS applications are secure and ready to be widely deployed. However there are two main challenges in this namely:

A] What is the type of software development service required?

There are two main types of services

- Development from scratch
- Customizing an existing solution

B] Who provides the software development support?

Entities providing support can be

- Open source community without formal organization or legal personality
- Organized community (e.g. non profit organization of users or developers with legal personality)
- Commercial company which provides software support

Although it has been reported, that using FOSS, does not guarantee any security benefit or limitation. The process of detecting security risks, bugs and errors in FOSS is rapid and so is the process of eliminating them, because the source code is made public. The challenge is in obtaining metrics for measuring software security for real time and mission critical software.

It is therefore important to invest in fine-grained comparison and versioning tools to carefully track changes and compare new versions of frameworks to determine the impact of upgrading to a future release Security Concerns in Using Open Source Software for Enterprise Requirements.

The source code of some popular open source products such as Linux, Apache web server would reasonably be peer reviewed by several users and security experts around the world. But, it should not be assumed that the source code of every open source product would be reviewed by security experts at this level. Most of the time the users of open source review the source code to customize the product to their needs in their environment.

The main issues raised in the level of support available and the degree of technical knowledge required installing and using FOSS software. With no vendor responsible for the software, support for FOSS

applications can vary, and often depends on the user/developer community's commitment to the project.

If the organization wants to implement the FOSS, and if staffs have no previous experience with it, creates problem to literate the employee with newly adopted software. Technical support which relies on someone responding to request for help is also a potential limitation, though FOSS communities are often very responsive to requests for help or advice, with replies to questions sent within minutes rather than days of the original request.

Other drawbacks of FOSS software include poor quality documentation, less user-friendliness than commercial software and lower functionality than commercial equivalents.

The task of maintaining a package repository is difficult: the maintenance team must monitor the evolution of thousand of packages over time, and address the error reports coming from different sources. It is desirable to automate as much of this work as possible. Our medium-term goal is to build tools that help distribution maintainers track dependency-related problems in package repositories.

III. OPPORTUNITIES IN FOSS -

The Free Open Source Software (FOSS), a comprehensive study of developers and users, showed that the most important reason for developers to participate in open source communities was to learn new skills — "for free". These skills are valuable, help developers to get jobs and can help to create and sustain small businesses. The skills referred to here are not those required to use free software, but those learnt from participation in free software communities. Such skills include not only programming but also skills rarely taught in formal computer science courses, such as copyright law and licenses.

Teamwork and team management are also learnt, the team management is required to coordinate the smooth collaboration, peoples who rarely see each other is more intensive and far subtler than what is required to coordinate smaller teams employed in a single software company.

The FOSS study showed that developers who provided "learning new skills" as their reason for joining the community often show "sharing skills" as an equally or more important reason for continuing their community participation. This is correlated with the duration of their participation in the community, and thus represents a shift from "apprentice" to "mentor" roles.

In a reflection of the development process for individuals, countries that profit most from open source are those that contribute back to the community and knowledge base, and there is a built-in incentive for a shift from being a recipient of skills to being a skills donor. So the process of "subsidy" is very dynamic, and is likely to lead not to a dependency relationship but rather to an equal relationship based on, among other things, local specializations for locally relevant issues.

One of the motivations for the use of FOSS is to try to achieve vendor-independence, which is to keep the ability to change software products or producers in future without FOSS. However, this can conflict with the requirement that the new software must be integral with already installed operational software. "Buyers who give priority to the latter criterion instead of using a general requirement for open standards or vendor-independent inter-operability remain locked in to software they previously purchased".

Another challenge, to provide training to the peoples who are going to adopt the new FOSS, this gives an opportunity to the some peoples, to design strong documentation about the software and also the video tutorials to provide training to the peoples.

The project's community must have to become a strong and wide to provide the supports required for the different users, and also must have to provide resources which are available to support new users of the software.

The coordinated efforts are required to work on new releases to find the bugs, security issues and also to fulfill the new requirements form the different users.

Everybody has to contribute back to the community with their skills so that the error free, strong and secured software domain will be available to others.

IV. CONCLUSION

Use of FOSS posses challenges and creates the equal opportunities to the peoples. Following are the some sectors of FOSS where we find the equal challenges and opportunities –

- Security risk in FOSS -
  As soon as the organization has decided to implement the FOSS, download open source software only from trusted sites, Scan for vulnerabilities, Disable unwanted services, so that the organization will satisfy with the features that are available with the software, and not facing the problems because of malware attacks.
- Bugs in software

Sometimes, whenever utilization of software at extreme level causes the bugs in the software. To resolve the bugs occurred within software the community has to provide the solution or some other groups who are providing the support to the software has to clear the bugs without damaging other part or data of the organization.

- Data migration from existing system
  This is an opportunity to skilled persons to migrate the existing data having with other vendor's software to the newly adopted FOSS. This task is a time consuming process but sometimes gives good returns.
- Training of the software to the enterprise
  Software design community sometimes design the software and they are not able to provide any type of training or documentation about the software. Within this case some community has to work on such scenario to resolve the problems of the users.
- Technical support and service agreement with enterprise
  Some organizations are fully installed the FOSS within their organization, in this case either the organization has to recruit the support team to resolve the problems occurred within the working of software or to take a support from the different service providers.
  The service provider gives the full support to the organization and both organizations are bind with the service agreement.

There are also conflicting opinions on to take advantage of FOSS software: the large organizations are more likely to have staff with the necessary skills and experience, while small organizations are more likely to be satisfied with the limited functionality found in currently available FOSS.

V. COPYRIGHT FORMS

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