

Factors Affecting the Use of Open Source Software in Tertiary Education Institutions

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Open Source Software (OSS) is software that has been released under a license which requires the distribution of the software's source code with any binaries. It is often available at no cost and is mostly supported by developers providing their services for free. Considerable interest has been shown in OSS by tertiary education institutions (TEIs) because of the promise of a reduced total cost of ownership of the software, potentially better support, freedom from vendor lock-in, ability to tailor the software and pedagogic benefits of being able to view the source code. To find out the extent of use of OSS by TEIs in Australia, New Zealand and the United Kingdom, a survey was sent out to technical personnel at all TEIs in these countries. The results of the survey show that OSS is already being used by all TEIs who responded to the survey and that the major reasons for this was lower Total Cost of Ownership and freedom from software vendor dependence. It is clear however that the majority of the OSS software being used is in server infrastructure with a lesser amount being used on normal desktop machines.

ACM Computing Classification System: K.4 Computers and Society, K.6 Management of Computing and Information Systems.

1 Introduction

Open Source Software (OSS) describes software released under a particular style of license which requires the distribution of the software's source code when any binaries are provided. Typically, open source software is available for no cost and has large numbers of developers adding new features and fixing bugs. Many examples have gained the reputation of being feature-rich, reliable, robust and secure. These attributes make OSS of particular interest to tertiary education institutions (TEIs), increasingly concerned with escalating software licensing costs. Security is becoming another driver towards OSS with the never-ending deluge of attacks against Microsoft-based systems and the constant requirement to update these systems against new vulnerabilities.

The rate of adoption of OSS in TEIs is unknown. Surveys have been conducted on its use in corporations and public institutions in Europe (Wichmann, 2002) and the military in the US (Kenwood, 2001) which showed that the majority of OSS deployed was for server based infrastructure and that the reasons for choosing OSS were reduced Total Cost of Ownership (TCO), greater stability and security and customisability.

It was decided to conduct a survey targeted at TEIs to explore the extent of the current usage of OSS and the perceived benefits and weaknesses of its use.

2 Survey

The extent of the uptake of OSS in TEIs, the reasons for this uptake and the successes and failures of this experience has been undocumented. A survey was constructed and sent to a list of technical contacts at TEIs in Australia, New Zealand and the UK. This list covered all of the major Universities in these countries. The survey was e-mailed to the technical contacts, completed electronically and then e-mailed back to the authors. Of those institutions contacted, technical contacts at 34 different institutions replied.

The number of systems each respondent was responsible for ranged from 10 to 18,000, with an average of 2,700 per respondent. 32 responses to the survey were received. 22 were Australian, 6 from the UK, 3 New Zealand and 1 Fijian Institutions.

The questions on the survey were split into 3 categories:

1. Experience and Skill in Open Source. This section contained questions which were aimed at gauging the level of exposure of the TEI to OSS and the skill set of the staff in dealing with the OSS.
2. Benefits of OSS. This section contained questions examining the perceived benefits of OSS from the TEIs. The benefits were categorised as relating to TCO, support related, open standards and interoperability and vendor independence.
3. Support. This section contained questions regarding the perception of support issues around the use of OSS.

Experience and Skill in Open Source

47% of respondents had evaluated open source software and decided on deployment. 81% of respondents were aware of open source and had experience with it.

78% of respondents reported having staff with skills in one or more open source packages. 72% were familiar with the open source development process.

50% had deployed open source in a significant way. A further 44% had deployed open source in a limited way.

In terms of deployment of OSS, 100% had it deployed as infrastructure (web servers, proxies, firewalls, file servers) with 50% deployed in administration, 53% using it in teaching, 56% using it in student labs and 50% using it in research.

Only 3% were contributing to development. 44% had contributed in a limited way in terms of filing bugs.

Benefits of OSS

84% stated that the OSS had reduced TCO. 53% cited being able to customise the software, 53% claimed better response for support and bug fixes. 78% claimed less reliance on a specific vendor and 59% adoption of open standards and interoperability.

Support

87% stated equivalent or better support (47% stated better) with 13% stating worse support.

68% stated support requirements were not higher than those of proprietary software. 32% stated they were higher.

16% of the respondents had put on extra services due to the use of open source software including extra help desk support and extra staff.

3 Conclusions

There is a scarcity of information regarding the issues surrounding the use of OSS in TEIs. Several studies have been conducted in other industries and report positive findings in terms of the functionality, reliability, maintainability, robustness, security, scalability of OSS software compared to their proprietary equivalents. Interest in exploring the use of OSS within organisations is gaining momentum with many optimistic about the possibility of reductions in TCO and avoidance of vendor control and potential lock-in.

From the results of the survey, it can be seen that OSS has already made a significant impact within TEIs in Australia, NZ and the UK. 94% of the respondents reported already using OSS in their institutions. It is also clear that the perception is that the TCO for OSS is less or at least the same as proprietary software, that it is no harder and sometimes easier to support, and that it offers significant advantages over proprietary software.

Perhaps the most interesting observation from the survey is that the primary reasons for adoption of OSS were the perception that there was a saving in TCO and that it freed the institution from reliance on a given vendor. This observation is in line with one of the original motivations of this study which was that OSS potentially provides TEIs with the opportunity for significant reduction in overall software purchase costs, software support costs and general maintenance costs in addition to the “non-material” benefits. The issue with this however is that it is likely to be a perception and not something that has been assessed in a scientific way. It is unlikely, to our knowledge, that any of the participants in the survey have conducted thorough and ongoing assessments of their costs with regards to OSS or compared these to any the alternative proprietary software approaches.

False perceptions on both sides are thus likely to have a large influence on decisions to deploy or not to deploy OSS. It is for this reason that a study should be conducted to actually examine the issues of using OSS amongst the different user roles and assess the issues, solutions and costs associated with the replacement of proprietary software with OSS.

References

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