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ABSTRACT

Open source software communities work in a loosely knit organizational structure that works primarily on the motivations of gift and contribution of source code. They communicate using modern Internet-based applications and organize themselves into self-guided virtual communities. Several methods of collaboration and development of intellectual property through software within these communities are quite unique and innovative. Current research effort mainly focused on understanding the individual motivations, collaboration mechanisms, and associated project management challenges of various OSS projects. However, as open source software usage moves mainstream and becomes more and more widespread, factors drive its diffusion and adoption deserve more research attention. Using the concepts of innovation adoption, we attempt to examine the possible drivers that influence adoption of open source software within different open source communities. In particular, the results from two user groups - one from an OSS community in United States, one from an OSS community in India, are extensively compared and contrasted to gain better understanding of factors that lead to adoption and use of open source software.

Keywords

Open Source Software, Innovation Adoption, Virtual Community.

INTRODUCTION

Open Source software is a fairly old concept but has gained popularity in the last twelve years or so due to a variety of factors. While proprietary software is usually sold in compiled binary format and with various restrictions on ownership and use (Feller et al. 2000), Open Source Software is generally developed through voluntary efforts, its users are typically licensed to access, modify and distribute the source code freely, provided that they would not redistribute the derived work under a more restrictive license (http://www.opensource.org).

While Linux, FreeBSD, Apache, MySQL, and Firefox are among some of the well-recognized labels in the world of OSS, the magnitude of OSS movement is much greater than the projects listed above. According to SourceForge.net, the world's largest repository of open source software (http://sourceforge.net), there are over 96,000 OSS projects currently hosted at SourceForge, with approximately 1,023,000 registered developers and users. These numbers indicate that OSS movement attracts sustained social interests, and dedicated, collaborative development effort. Over time, it has gained momentum and support from leading commercial hardware/software companies.

Within the IT industry, several large corporations have taken major initiatives to support OSS solutions. These include IBM, Apple, Cisco, and Oracle etc (Feller et al. 2000; Gallivan 2001). The recent OpenSolaris initiative to open source the latest Solaris 10 technology from SUN Microsystems Inc. is another example of mainstream IT vendors becoming major contributors to Open Source (http://opensolaris.org/). Other companies like Red Hat Inc. and SuSE, Inc. build their entire business model around providing training, consulting, and other services to support open source software (Markus et al. 2000). In addition, OSS movement has already become an international phenomenon. A growing number of government agencies in such countries as India, China, Malaysia and Australia believe that OSS is the best path to bridge the digital divide (Schenker, 2004). In one of his speeches, the President of India – Dr. Abdul Kalam, openly advocated broader adoption of OSS because "open-source software offers the developing nations the best opportunity to modernize." (Becker,

2003). It is evident from various activities in the industry that the gap between early adoption and mainstream use of OSS is decreasing dramatically.

From the perspective of information systems, open source presents a challenge that needs to be researched on several fronts, including systems analysis and design, systems development, software use, implementation issues, quality assurance and strategic role of software. While OSS has attracted substantial research interests among IS academic community, majority of the conducted studies have focused on the *development* perspective of OSS (Fitzgerald and Kenny, 2003). For example, various researches have studied the development of some most successful OSS projects such as Linux, Apache and Mozilla (Hertel et al. 2003, Koch and Schneider, 2002, and Mockus et al, 2000). However, as OSS becomes widely used across the world, the *adoption* perspective of OSS deserves more research attention.

In a previous effort, we examined the various channels of diffusion as well as perceived attributes that potentially influence the adoption of OSS within the open source community (Verma and Jin, 2004). In this paper, we examine this perspective by comparing and contrasting OSS adoption across two different geographical regions. In particular, we study two different OSS communities in India and the US. We chose these groups based on the following criteria: First, both groups were located in a region of the country with significant concentration of high-tech companies. Second, both groups were not only aware but also fully exposed to OSS applications and platforms. Note that, given the uniqueness of OSS phenomenon, we intend to investigate this adoption perspective within the OSS community context. In other words, our research findings may not be generalized to populations outside OSS communities.

Given the different social and economical environments of United States and India, perceivably, the OSS adoption in US may be driven by the idealism behind the freedom to collaborate and exchange through source code, while the OSS adoption in India may be determined by its low cost and geopolitical impact. Therefore, we expect different attributes emerge as the driven factors that potentially influence the adoption of OSS within its community.

LITERATURE REVIEW

Software Adoption within OSS Community

While more and more organizations across the globe start to adopt and use open source software, some of those decisions may be driven primarily by the low cost of the software itself. As pointed out by Fitzgerald (2003), users involved in the OSS adoption in an Ireland hospital do not have any desire to make change to the source code, "apart from a five-line change to Linux to allow their Oracle database applications to run on it." This may be very different from why a technology savvy member of the open source community chooses to use open source software. In the latter case, availability of the source code and freedom to change it are very important. Moen (2003) suggests that "the long-term control over IT" is the more important factor that drives OSS adoption within the open source community.

Essentially, the success of an open source project relies on the support from, and cooperation among, various groups involved in the open source community. Different roles can be approximately categorized into four groups, including project owners/core developers, patch submitters, source code QA (Quality Assurance) testers, and end-users.

Project owners/core developers are a small group of people who contribute most of the code and control the software releases. In the case of Apache project, for example, the core developers accounted for over 80% of the coding (Mockus et al. 2000). Patch submitters involve a relatively wider development community who examine the source code in detail and submit bug fixes. Source code testers are comprised of an even larger group who download and compile the source code and report the bugs. Lastly, end-users, who may constitute the largest group of all, are only interested in using pre-compiled binary software. Taking Mozilla project as an example, approximately, there are about 25 core developers, 400 patch submitters, 10,000 QA testing contributors and around 500,000 end users involved (Dotzler 2003). The "gift culture" within the open source community features giving away source code, voluntarily testing and debugging the software, and supporting fellow users by promptly answering their posted questions through mailing list (Bergquist et al. 2001; Raymond 2001).

Ye et al. (2002) argue that in order for an OSS project to be sustainable, the system and the community must co-evolve. A high quality OSS project tends to attract new members, and motivate them to learn more about the system. As new members get more involved, they gradually gain more understanding about the system. As inspired OSS community members migrate from new users to bug reporters, followed by moving becoming patch submitters and eventually to core developers, their various contributions not only redefine the social dynamics within the OSS community, but also support and improve the quality of OSS project as a whole. Therefore, "a large base of contributing members" is identified as "one of the most important success factors of OSS." (Ye 2002). This co-evolution and role transformation process within OSS community can be alternatively viewed as the diffusion and adoption of the innovative process of open source development.

Based on these observations, we hypothesize that while the success of an open source project depends on how well it is

perceived and gets adopted across all four groups within the community, the primary factors that drive the adoption process may be significantly different across communities. Identifying these drivers and recognizing the differences between them will help us in understanding the adoption process of open source projects across various communities. We will also be able to examine the fine differences between open source communities in different parts of the world. Additionally, it contributes to innovation diffusion and adoption research in general.

Diffusion and Adoption of an Innovation

We chose to identify open source software as an innovation. By identifying open source software as an innovation, we can study its growth, acceptance and position in the software industry using the innovation adoption related theories. The process by which innovations spread from one locale to another is called diffusion (Brown 1981). The diffusion process consists of four elements: the innovation itself, communication about the innovation, time taken for diffusion and social system where the diffusion and adoption takes place (Mahajan et al. 1990). The influence of perceived attributes of an innovation on the adoption process was initially suggested by Rogers (1995). Other factors such as Image (Tornatsky et al. 1982), and voluntariness (Moore et al. 1991) have proved to be important attributes in related studies. Further, other researchers have also found that users and potential adopters, especially in the area of information technology, differ in their views of behavioral intention, attitude and subjective norm towards adoption (Karahanna, Straub and Chervany 1999). While we do not blindly include all variables use in successful studies in the past, we use these studies as a guideline for selecting our variable pool. The selected variables are ones that appear to have a strong influence on adoption of information technologies. We examine the adoption of OSS as an innovation using its perceived attributes. These constructs are further defined by variables in the following section.

RESEARCH MODEL

The theoretical model for this study draws its strengths from the research stream related to the adoption influenced by perceived attributes of the innovation. First, communication plays a central role in Internet related technologies. Researchers have found communication very helpful in the explanation of variation in diffusion (Bass 1969; Cooper et al. 1990; Fuller et al. 1992; Mahajan et al. 1990). The OSS communities heavily rely on the Internet for important communication channels to organize various activities that surround OSS development, distribution, debugging, and maintenance processes. Many other studies on innovation have established that the explanation of the variation in the adoption patterns can be accomplished primarily by the perceived attributes of innovation. Studies in fields ranging from agriculture to information systems have found support for the perceived attributes of innovation as defined by Rogers (Rogers 1995). We look at the following variables to define the adoption due to perception of attributes: Relative advantage, compatibility, ease-of-use, result demonstrability, visibility, and trialability. Further, based on the fit of voluntariness and image with the open source software concept, we decide to include these variables as well. Figure 1 illustrates our research model.

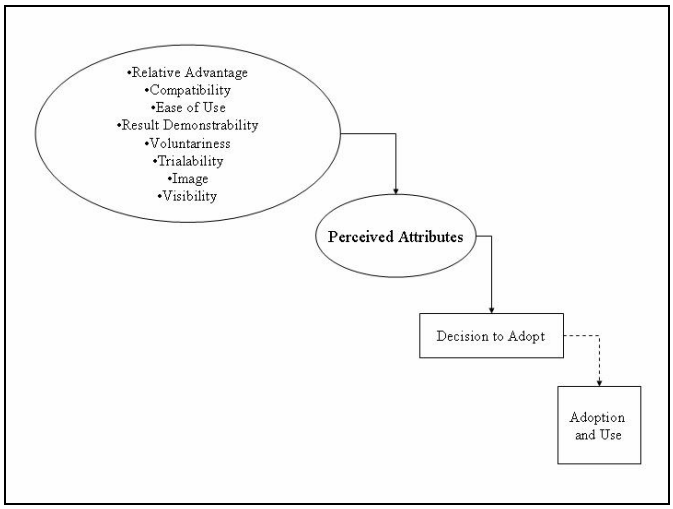

Figure 1. Research Model

The dependent variable in this study is the rate of adoption of open source software. Since this was a cross-sectional study, we could not measure the adoption of OSS over a set period of time. Considering that OSS has largely grown from an

insignificant base in the early 90's, and its recent focus in the IT industry, we felt that it was safe to assume that the growth of OSS was in its early stages. Therefore, instead of using the rate of adoption, we use frequency of use as our surrogate measure. In measuring the rate of adoption, we define it as the degree of use of open source software at a given point in time. As OSS is a very wide concept, we divide it into several categories of software running on client and server platforms. These categories include the operating system, the user interface, application and productivity software, and network related applications. Table 1 lists our research hypotheses.

Hypothesis	Statement
H1	Rate of adoption of OSS is expected to be high because of a high degree of voluntariness by its users.
H2	Rate of adoption of OSS is expected to be high because of its relative advantages over proprietary software.
H3	Rate of adoption of OSS is expected to be high because of its high degree of compatibility with its users' mode of work.
H4	Rate of adoption of OSS is expected to be high because of its image versus the image of proprietary software.
H5	Rate of adoption of OSS is expected to be high because of its ease-of-use over proprietary software.
H6	Rate of adoption of OSS is expected to be high because of result-demonstrability over proprietary software.
H7	Rate of adoption of OSS is expected to be high because of its visibility over proprietary software.
H8	Rate of adoption of OSS is expected to be high because of its trialability over proprietary software.

Table 1: Research Hypotheses

METHODOLOGY

We decided to use the instrument developed by Moore and Benbasat (Moore et al. 1991) to measure perceived attributes that can influence the adoption of an innovation. This instrument has been used in a variety of studies. We modified the instrument's language to suit our problem. This instrument was designed to measure perceived attributes of an innovation in an organizational setting (Moore et al. 1991). While this instrument is somewhat applicable to the current problem in a business setting, it does not lend itself very well to the open source community. The open source community is a loosely knit organization, but is very much unlike a business. The organization itself is a community of users who communicate with each other using a variety of synchronous and asynchronous communication tools on the Internet. The open source community in some sense is a virtual organization (Gallivan, 2001), but it is not a typical workplace environment.

To accommodate the community aspects of open source, we modified the instrument and subjected it to two qualitative and one quantitative pilot test. The tests were designed to ensure the clarity of questions and their response mechanism. The final pilot study was implemented using a HTML form and a database back-end for data collection[1]. A copy of the instrument is attached in the appendix.

Population Identification

This research is designed to examine some of the aspects of the inner workings of the open source community. This community includes core software developers, the patch submitters, the bug fixers, and the end users, who either use the software in source form (compile from source code) or in finished binary form. We intend to study the behavior of all these categories. One of the bodies that can act as a sampling frame for this population is a Linux User Group (LUG). According to Linux.org, there are currently more than 800 registered LUGs in 104 countries, including 309 of them located in the United States. Contrary to its name, a LUG addresses issues beyond just Linux. For example, important LUGs activities include "teaching members about software running on Linux" and "Discuss the free software / open-source movement" (Moen, 2003). Most LUGs present topics beyond just Linux, and discuss more general topics surrounding Open Source Software - including server-side and client-side application software, licensing, legal issues, trends and experiences related to OSS adoption. A cursory search on Google yields the following proportions (table 2) of the terms mentioned on mailing lists related to LUGs. As is evident, a lot more OSS is discussed on LUG mailing lists than simply Linux.

[1] Instrument was developed using PHP and MySQL served via Apache.

Term	Explanation	Count	Proportion
Linux	Operating System	36600	100.00%
Apache	Web Server	1620	4.43%
BSD	Berkeley Software Distribution UNIX	803	2.19%
Mozilla	Web Browser	862	2.36%
grep	A UNIX command for search	1520	4.15%
UNIX	Operating System	3610	9.86%
MySQL	Database	429	1.17%
GNOME	Desktop System	1030	2.81%
KDE	Desktop System	1060	2.90%
OpenOffice	Productivity Suite	195	0.53%
Perl	Scripting language	1800	4.92%
PHP	Scripting language	537	1.47%
CVS	Concurrent Versioning System	658	1.80%
GPL	General Public License	1050	2.87%
GNU	GNU's Not UNIX	2640	7.21%

Table 2. OSS Term Count

Given the direction of recent IT outsourcing trends and an increase in the prominence of the software industry in India, we decided to examine comparable groups in the US and in India. We chose to work with two such LUGs as a sampling frame to obtain our samples. We randomly selected approximately 70% of the users from each group. The sample consisted of 700 (US) and 500 (India) de-identified[2] e-mail addresses. The de-identification method employed in our survey ensures that the respondent's identity cannot be divulged based on their unique ID. The approach makes the data collection process fairly anonymous. Further, we attempted to minimize self-selection bias by randomizing the sample and inviting only the potential respondents via individual e-mail as opposed to a mass mail invitation on the mailing list or the LUG website. Since many members of such mailing lists are self-subscribed, open announcements tend to amplify the self-selection bias. Our approach ensures that only the randomly selected respondents get the invitation. Other measures were used to ensure uniqueness of responses to prevent duplicate entries and to stop uninvited respondents from filling out the questionnaire.

From the US group, we received 110 (15.7%) responses, out of which 106 (15.1%) were used in the final data analysis. From the Linux User Group in India, 46 (9.2%) members responded to our survey. After three outliers were removed from our data set, 43 (8.6%) responses were analyzed.

RESEARCH FINDINGS

The instrument used in our surveys shows strong reliability. All variables measured through it display a Cronbach alpha value (Cronbach, 1951) greater than 0.7. We also tested for multi-collinearity among the independent variables. We ran Stepwise, R- Square, Adjusted R-Square, and Full Model with elimination approaches to regression to look at the results from various angles. The results are displayed in the following tables and figures.

The data analysis result of the US group is illustrated in table 3. As it is indicated, we were able to reject the null hypotheses for Ease-of-Use (EA), and Compatibility (CP). Interestingly, even though both variables are significant, Ease-of-Use (EA) has a higher parameter estimate. Therefore, it holds the dominant position, followed by Compatibility (CP).

Table 4 shows the results of for the India group, in which case, we were only able to reject the null hypothesis for Compatibility (CP). Interestingly, some of the classic adoption variables such as Relative Advantage (RA) were not significant in the final model for both groups. In Table 5, we present the summary of our data analysis results for both US and India groups. The result of our hypothesis tests from both groups are listed in Table 6.

[2] De-identification is mandated by the committee for protection of human subjects. We used MD5 hashes as unique identifiers instead of email addresses.

The REG Procedure
Model: MODEL1
Dependent Variable: Dependent Dependent

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	26.51155	13.25578	16.87	<.0001
Error	103	80.92136	0.78564		
Corrected Total	105	107.43291			

Root MSE	0.88637	R-Square	0.2468
Dependent Mean	5.27516	Adj R-Sq	0.2321
Coeff Var	16.80264		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	2.64067	0.48022	5.50	<.0001
CP	CP	1	0.20584	0.09114	2.26	0.0260
EA	EA	1	0.26450	0.07962	3.32	0.0012

Table 3. Regression Model for the US Group

The REG Procedure
Model: MODEL1
Dependent Variable: AVG AVG

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	11.89029	11.89029	13.59	0.0007
Error	41	35.87823	0.87508		
Corrected Total	42	47.76852			

Root MSE	0.93546	R-Square	0.2489
Dependent Mean	5.23355	Adj R-Sq	0.2306
Coeff Var	17.87421		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	2.68830	0.70508	3.81	0.0005
cp	cp	1	0.44733	0.12135	3.69	0.0007

Table 4. Regression Model for the India Group

	US Group	India Group
Sample	704	446
Respondents	110	46
Outliers	4	3
Models	Full, Stepwise, R-Square, Adjusted R-Square	Full, Stepwise, R-Square, Adjusted R-Square
Significant Variable(s)	Ease-of-Use (EA), Compatibility (CP)	Compatibility (CP)
R-Square	0.2468	0.2489
Adjusted R-Square	0.2321	0.2306
Cronbach's Alpha	0.743866	0.880585

Table 5: Summary of Data Analyses for Both Groups

Hypothesis	Statement	Supported US Group	Supported India Group
H1	Rate of adoption of OSS is expected to be high because of a high degree of **voluntariness** by its users.	No	No
H2	Rate of adoption of OSS is expected to be high because of its **relative advantages** over proprietary software.	No	No
H3	Rate of adoption of OSS is expected to be high because of its high degree of **compatibility** with its users' mode of work.	**Yes**	**Yes**
H4	Rate of adoption of OSS is expected to be high because of its **image** versus the image of proprietary software.	No	No
H5	Rate of adoption of OSS is expected to be high because of its **ease-of-use** over proprietary software.	**Yes**	No
H6	Rate of adoption of OSS is expected to be high because of **result-demonstrability** over proprietary software.	No	No
H7	Rate of adoption of OSS is expected to be high because of its **visibility** over proprietary software.	No	No
H8	Rate of adoption of OSS is expected to be high because of its **trialability** over proprietary software.	No	No

Table 6: Hypothesis Test Results

DISCUSSION AND CONCLUSION

While the OSS community works like many other virtual communities for software development, it is distinctly different in its approach, especially with respect to freedom of source code and sharing of intellectual property. Motivations for developing free software are often questioned by traditional software developers. Other issues such as guarantees, quality and usability of open source software are also points of contention in news media and research.

The goal of this study was to examine the adoption within two separate OSS communities. Note that we do not address diffusion and adoption issues ***outside*** the OSS communities. Therefore, the external validity (Cook & Campbell, 1979) of the results of our study is not applicable beyond the open source communities in general. First, let us take a look at the adoption of OSS in the US group. We find two perceived attributes to be significant. The significance of ease of use (EA) variable is contrary to what we expected to see. OSS has often been labeled as difficult to use by the proprietary software world, in part due to the perception that it lacks support, structure, ownership and direction. Users initially complain that OSS does not

come with manuals, and there are few channels of technical support when the user needs help. However, if we look at this from an *internal* perspective, this study focuses on the ease-of-use perception of OSS community members, and not those outside it. Based on several comments from respondents, we find that, within the community, users get accustomed to the methods of OSS development very quickly. Downloading source code from code repositories, patching it, compiling it, and finally using it are all considered "use", as opposed to simply using the binary form of software (as with proprietary software). So, while the use of open source software may be perceived as difficult outside the OSS community, it is quite the contrary *inside* the community. Insiders consider the availability of source code to be an "ease-of-use" factor.

The other interesting finding is the significance of compatibility (CP). It is not uncommon for many members of OSS community to use open source software in diverse environments. With recent advents in the scalability (both up and down) of the Linux 2.6 kernel series, it is now possible to run Linux-based applications on platforms ranging from handheld PDAs and cell phones to enterprise-level server farms. This range has improved the compatibility of OSS with respect to the environment they work in. Additionally, due to improvements in desktop software such as productivity suites, instant messaging, and digital media entertainment, OSS users find it easier to employ software in their work or home environments. Another improvement which goes towards pushing the compatibility of OSS is the availability of device drivers for a variety of hardware, which was sorely lacking a few years ago. All these observations lead to supporting the perception of a better or higher compatibility with one's work environment.

Looking at the results from the India group, we see that compatibility (CP) is the only significant variable. In this case however, the challenges are a bit different. India has IT powerhouses, but there are a lot more schools and colleges that have older computers with limited infrastructure. India also poses a challenge of language diversity. The Indian language list has over 14 languages listed as official. Of these, we find entire GNU/Linux distributions for Hindi, Bengali, and significant support for Hindi, Gujarati, Bengali, Telugu and Tamil. The Indix Project (http://rohini.ncst.ernet.in/indix/) produces character sets and Windowing Systems (localization of GNOME and KDE) for many Indian languages. High availability of software support for local languages makes it very compatible with their work/lifestyle. Additionally, many places have slower computers, which are incapable of running demanding operating systems and applications such as Windows XP and Microsoft Office 2003. For such cases, OSS presents lightweight alternatives that can run on older computers with fewer resources.

We also find that as opposed to the US group, the ease-of-use (EA) factor is not significant in the India group. One reason could be that while many projects are initiated and facilitated in the US, India appears to have end-users for most part. These people are either unable to or uninterested in developing software from source. A large facilitator of OSS development is the Internet. India still does not have access to high-speed Internet access across the country. Internet access is largely restricted to large cities and universities. Therefore, most OSS community members find it difficult to participate in the current events of the OSS operations worldwide. However, they have access to inexpensive (free) software localized for their environments available via CDs for installation. This might change over time as the availability of high-speed networking becomes widely available there.

Overall, users of software in the proprietary domain are accustomed to precompiled binary files that require little intervention on their part. In the OSS world, we find that many pieces of software are available only in source code format. Users are expected to configure, compile and install these programs from scratch. Therefore, while OSS adoption is being facilitated due to its increasing compatibility and ease-of-use within the community, some of the peculiarities such as working with source code might impede its adoption in non-open source communities. While we have taken precautions to keep the biases down to a minimum, the applicability of these results may not be applicable to the entire open source communities in the US and India.

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APPENDIX

Frequency of Use of Software in the OSS Community - Survey Page 3 of 5

To the best of your ability, please select a number to indicate the FREQUENCY of use based on the following scale:

(1) Almost Never (2) Usually Not (3) Sometimes (4) Occasionally (5) Often (6) Usually (7) Almost Always

Server Side Access

11. I use Open Source **operating systems** such as Linux or FreeBSD on a **server** installation	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
12. I use an Open Source **graphical user environment** such as GNOME or KDE on a **server** installation	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
13. I use Open Source **Internet servers** such as Apache, Sendmail, or WUFTPD, on a **server** installation	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
14. I use Open Source **Database servers** such as MySQL, or **Application servers** such as JBoss, on a **server** installation	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
15. I use **Networking applications** such as firewalls, routing programs, DHCP on a **server** installation.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA

Client Side Access

16. I use Open Source **operating systems** such as Linux or FreeBSD on a **desktop or laptop**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
17. I use an Open Source **graphical user environmet** such as GNOME or KDE on a **desktop or laptop**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
18. I use an Open Source **productivity suite** like OpenOffice or Koffice on a **desktop or laptop.**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
19. I use Open Source **Internet applications** such as Mozilla (browser), Kmail(email client), or Kbear(FTP client) on a **desktop or laptop**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
20. I use an Open Source **graphics program** such as GIMP or a **multimedia program** such as XMMS on a **desktop or laptop.**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
21. I use a **programming environment or IDE** such as Kylix or PHPEd on a **desktop or laptop.**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
22. I use Open Source **Networking applications** such as firewalls, routing programs, DHCP on a **desktop or laptop.**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA

(1) Almost Never (2) Usually Not (3) Sometimes (4) Occasionally (5) Often (6) Usually (7) Almost Always

Submit and Continue

Using Open Source Software in the OSS Community - Survey Page 4 of 5

Please select a number to indicate your judgement for each statement, based on the following scale:

(1) Disagree Strongly (2) Disagree (3) Disagree Slightly (4) Neutral (5) Agree Slightly (6) Agree (7) Agree Strongly

23.The OSS community does not require me to use Open Source software.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
24. Using Open Source software enables me to accomplish tasks more quickly.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
25. Using Open Source software is compatible with all aspects of my work environment.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
26. People in the OSS community who use Open Source software have more prestige than those who do not.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
27. I believe that it is easy to make Open Source software to do what I want it to do.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
28. I would have no difficulty telling others about the result of using Open Source software.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
29. In the OSS community, one sees Open Source software being used on many computers.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
30. Open Source software was available to me to adequately test run various features.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
31. Although it might be helpful, using Open Source software is certainly not mandatory in my work.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
32. Using Open Source software improves the quality of work I do.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
33. I think that using Open Source software fits well with the way I like to work.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
34. People in the OSS community who use Open Source software have a high profile.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
35. Overall, I believe that Open Source software is easy to use.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
36. I believe I could communicate to others the consequences of using Open Source software.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
37. Open Source software usage is **NOT** very visible in the OSS community.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA

(1) Disagree Strongly (2) Disagree (3) Disagree Slightly (4) Neutral (5) Agree Slightly (6) Agree (7) Agree Strongly

Submit and Continue

Using Open Source Software in the OSS Community - Survey Page 5 of 5

Please select a number to indicate your judgement for each statement, based on the following scale:

(1) Disagree Strongly (2) Disagree (3) Disagree Slightly (4) Neutral (5) Agree Slightly (6) Agree (7) Agree Strongly

38. I did not have to expend very much effort to try out Open Source software.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
39. My use of Open Source software is voluntary.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
40. Using Open Source software makes it easier to do my work.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
41. Using Open Source software fits into my work style.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
42. Using Open Source software is a status symbol in the OSS community.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
43. Learning to use Open Source software is easy for me.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
44. The results of using Open Source software are apparent to me.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
45. I have had plenty of opportunity to see Open Source software being used.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
46. There are enough people in the OSS community to help me try the various uses of Open Source software.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
47. Using Open Source software enhances the effectiveness of my work.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
48. Using Open Source software improves my image within the OSS community.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
49. I have seen what others do using Open Source software.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
50. Using Open Source software gives me greater control over my work.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA
51. Because of my use of Open Source software, others in the OSS community value me more.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7	○ NA

(1) Disagree Strongly (2) Disagree (3) Disagree Slightly (4) Neutral (5) Agree Slightly (6) Agree (7) Agree Strongly

Submit and Continue

Anonymous Comments

Any feedback from you regarding this survey would be highly appreciated. You could post your anonymous comments here:

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