IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 07, Issue 1, January 2017, ||V -3|| PP 44-48

Analysis the Analytical Analysis of Open Source Software Technology

Pooja gulia
Research scholar opjs university

Dr Rajeev Yadav
Professor opjs university

ABTRACT
This research represents the first attempt to conduct a comprehensive quantitative investigation into the factors influencing the adoption of OSS in IT outsourcing organizations serviced by Indian IT service providers. This study contributes to the empirical literature on the diffusion of OSS adoption at organization level. Specifically, using a unique survey data set of IT outsourcing organization serviced by Indian IT service providers, the study examines the adoption of Open source software. This survey yielded information for 482 global IT outsourcing organizations, including the degree of outsourcing and level of OSS adoption. There is very little information in the models, theories, and frameworks to explain the adoption of open source software in organizations. Empirical evidence concerning Ven and Verlest's predictions has thus been far limited to the effect of OSS server software adoption on organizations. This research examines a related, but new and different issue: what factors influence the OSS adoption across IT outsourcing organization and its service lines (which in by itself constitutes mini-organization with different characteristics). In addition, unlike previous studies that focused on organizational adoption of OSS, this study analyzes from the dimension of IT service providers and the mutual relationship amongst IT outsourcing organization, IT service provider, and OSS community. The study developed at a mathematical model to compute the adoption level based on the parameters of the conceptual model. This appears to be the first study to analyze OSS adoption and propose a model at IT outsourcing organizations' service line level.
KEYWORDS: *software, technology, information*

I. INTRODUCTION

Open Source Software (OSS) is software whose source code has been published and is made available to the public. OSS has gained significant momentum over the last two decades and has changed the way software is perceived, developed and deployed in many areas. It is often seen as a disruptive technology that has changed the rules of the Information Technology (IT) industry. Indian IT industry is the face of modern India and has been one of the most significant growth contributors for the Indian economy. Given that the primary force driving IT outsourcing appears to be cost savings, it is perhaps natural that companies might eventually focus on OSS . A Gartner report highlights that IT outsourcing organizations are compelled to look at open source software alternatives and India-based IT service providers must evolve to capitalize on this OSS trend . The sudden success and increased adoption of this new and innovative open source strategy has raised many questions, attracted the interest of academics in a variety of disciplines and prompted interdisciplinary research.

Research activities were focused on various aspects of OSS including software development practice and methods, diffusion, business models, community relationship, public policies, and benefits and drawbacks. Though there were prior research activities in the OSS adoption process, there has been little focus on organizational concerns in adopting OSS, especially in an IT outsourcing context. This research investigated the factors influencing adoption of open source software in global IT outsourcing organizations serviced by Indian IT service providers. A conceptual model is proposed based on the study findings that would help IT service providers to understand OSS adoption in their clients' (IT outsourcing) organization, and serve them better. Further, the findings were used to test the applicability of the technology adoption and outsourcing theories in the realm of OSS adoption. In the next section, a brief overview of the concepts and definition related to this research is presented. This is followed by a literature synopsis and gaps in research, leading to the study's research aim and objectives. Finally an outline of the thesis is provided.

Since 1997, Open Source software (OSS) have taken up a good market in computer industry. Large number of Open Source Software are available on Internet. The world's largest OSS development web site is SourceForge.net. It provides free hosting to OSS development projects with a centralized resource for managing projects, issues, communications, and code. Currently there are 1,66,993 registered projects and there are 1,771,097 registered users[7]. There is a general confusion, among the users about open source, freeware,

shareware and public domain software licenses. Freeware is a software that is released free of cost in binary format only, usually prohibiting modifications and commercial redistribution on the part of the end user. Shareware is a software that is released free of cost in binary format only, usually allowed on a trial basis regarding time usage or functionality to encourage purchase. Public domain is a software whose copyrights has expired or has been released from copyright obligations by the author(s), rendering it free of restrictions on usage and redistribution. The open source model on the other hand is a collaborative programming infrastructure that co-opts copyright law by freely releasing source code to the general public for any use, modification, and redistribution without licensing restrictions. The source code refers to instructions written by humans in a computer programming language to be compiled into a binary format that can run on a computer, carrying out the tasks outlined in the source code

OSS LICENSES

Based on the characteristics of FOSS licenses listed above, there are numerous FOSS licenses, and their contents vary. Currently, there are some 60 licenses, which are categorized as free software licenses by FSF [6]. The licenses recognized by OSI also number close to 60. All these licenses can be divided into three types: GPL type, BSD type, and others**.**

Open source is a development and distribution model that is enabled by a licensing tactic. An open source software license is defined as a license that attempts to confer the kind of rights, privileges, and obligations associated with the definition of open source software. The licenses for most proprietary software are designed to take away the freedom to share and change it. By contrast, OSS license guarantees the freedom to change and share the modifications without any cost.

There are two categories of OSS licenses, namely Copyleft and Non-copyleft licenses. Copyleft licenses such as GNU General Public License (GPL), forbid distributors to make changes to the licensing terms when distributing or modifying the software. Every copy of the software, even if changed, will be under the same license as the original program. For example, a software developed using OSS components distributed under GPL might also have to be released under the GPL itself, which is the reason for the so-called viral effect of copyleft software.

Non-copyleft licenses such as Berkeley Software Distribution (BSD) license, allows distributors and modifiers of the software to change the license of the software and even to make proprietary copies of the software - in most cases even without changing the source code. Usually, only minor obligations exist, such as keeping a copyright note of the original authors. According to the Black Duck® KnowledgeBase™ , which claims to include information on over one million open source projects from more than 6,000 sites and contains detailed data for over 2,200 unique software licenses, copyleft licenses account for over 55% of licenses in open source projects.

IT Outsourcing Outsourcing refers to the transfer of a process or function to an external provider.Two organizations (Client and Vendor) enter into a contractual agreement involving an exchange of services and payments. Outsourcing is to help organizations perform well in their core competencies and mitigate shortage of skill or expertise in the areas where they want to outsource. IT outsourcing refers to the use of external service providers to effectively deliver IT-enabled business process, application service and infrastructure solutions for business outcomes. It helps clients to develop the right sourcing strategies and vision, select the right IT service provider(s), structure the best possible contracts, and govern deals for sustainable win-win relationships with external providers. In addition, IT outsourcing can enable organizations to cut costs, accelerate time to market, and take benefit of external expertise, assets and/or intellectual property.

Globally Distributed Software Delivery

Prevention-based quality management practices in software development involve activities such as training that are primarily done to avoid the occurrence of errors. For our model, we compute a score for this approach based on the percentage of total development effort spent on training, project planning and configuration management activities.

Globally distributed software delivery (also referred as Global delivery model) refers to model of executing a technology project using an outsourced team that is distributed globally in offshore delivery centres. Offshoring is about location - when an activity is outsourced, it is performed in a different location to the main operation. Outsourcing, on the other hand, is about governance when an activity is outsourced, it is performed by another organization, as opposed to in-house by the organization itself. Indian IT service providers are pioneers of this model wherein a significant chunk of technology work of global corporations (IT outsourcing organizations) are delivered out of low cost locations such as India.

Information technology has played an important role in library and information science. Due to the developments in information technology, now, it is possible for libraries to provide several new services to the library users along with traditional services. Libraries are now able to provide information in print form as well

as in digital form. During 1980s libraries started automating their bibliographic databases and during 1990s digital library projects were initiated. As on today, lot of developments has taken place in digitizing print media. At national and international level several big funding projects have been initiated to digitize valuable material available within the libraries for the preservation as well as for providing wider access to the collections through latest technologies.

Digital libraries have been making their roots in the library profession as a separate discipline and many conferences, workshops and seminars are taking place in the area of digital libraries. These conferences are covering different topics under digital libraries such as collection development and organization, user studies, digital library architecture, usability studies, search and retrieval, digital library software or providing value added services to end users. Digital libraries are becoming popular and are becoming one of the important activity of any organization. The rapid growth in computing networks, databases and public awareness have contributed to a hot topic of today such as digital libraries, digital archives, institutional repositories or digital repositories.

OSS has changed the way organizations develop, acquire, use, and commercialize software. Over 75% of IT organizations leverage non trivial elements of open-source software technology in their mission-critical IT portfolios, including cases where they might not be aware of it. Most of the closed-source vendors have passed the stage of rejection and denial of open source and, instead, have turned to open source as a key part of their software development strategies. While Indian companies have been less adventurous and stuck to proprietary software, economic slowdown and stressed profitability margins had pushed Indian IT service providers to leverage OSS for its clients.

Open Source Movement

In 1998, a gathering of people upheld that the term free software be supplanted by open source software (OSS) as an articulation which is not so much vague but rather more agreeable for the corporate world. Software designers might need to distribute their software with an open source software permit, so anyone may likewise foster a similar software or see how it functions. Open source software by and large permits anyone to make another form of the software, port it to new working frameworks and processor structures, share it with others or market it. The point of open source is to leave the item alone more reasonable, modifiable, duplicatable, dependable or just open, while it is as yet attractive. The Open Source Definition, strikingly, presents an open-source reasoning, and further characterizes a limit on the use, change and rearrangement of open-source software. Software licenses award rights to clients which would some way or another be disallowed by copyright. These remember rights for utilization, alteration and rearrangement. A few open-source software licenses have qualified inside the limit of the Open Source Definition. The most noticeable model is the mainstream GNU General Public License (GPL). While open source presents an approach to comprehensively make the sources of an item freely available, the open-source licenses permit the creators to tweak such access. The "open source" name emerged from a procedure meeting held in Palo Alto in response to Netscape's January 1998 declaration of a source code discharge for Navigator (as Mozilla). A gathering of people at the meeting included Todd Anderson, Larry Augustin, John Hall, Sam Ockman, Christine Peterson and Eric S. Raymond. They utilized the chance before the arrival of Navigator's source code to explain a potential turmoil brought about by the equivocalness of "free" in English. The 'open source' development is by and large idea to have started with this methodology meeting. Numerous individuals, by the by, guaranteed that the introduction of the Internet, since 1969, began the open source development, while others don't recognize open source and free software developments. The Free Software Foundation (FSF), began in 1985, planned the word 'allowed' to signify "free as in free discourse" and not "free as in free lager." Since a lot of free software previously was (and still is) for nothing, such free software got related with zero expense, which appeared to be against business.

2. Advantages of Open Source Software

Lower software costs: Open source arrangements for the most part require no permitting expenses. The sensible augmentation is no support charges. The solitary uses are for media, documentation, and backing, whenever required.

Worked on permit the board: Obtain the software once and introduce it as ordinarily and in however many areas as you need. There's no compelling reason to tally, track, or screen for permit consistence.

Lower equipment costs: as a general rule, Linux and open source arrangements are carefully conservative and versatile, and therefore require less equipment ability to achieve similar assignments as on traditional workers (Windows, Solaris) or workstations. The outcome is you can get by with more affordable or more established equipment.

Scaling/union potential: Again, Linux and open source applications and administrations can regularly scale impressively. Various alternatives for load adjusting, bunching, and open source applications, like data set and email, enable associations to increase for new development or solidify to accomplish more with less.

Backing: Support is accessible for open source—regularly better than exclusive arrangements. To begin with, open source support is uninhibitedly accessible and open through the online local area by means of the Internet. Furthermore, second, numerous tech organizations are presently supporting open source with free on the web and different degrees of paid help. For instance Liblime.

Getaway merchant lock-in: Frustration with seller lock-in is a reality for all IT chiefs. As well as continuous permit charges, there is absence of movability and the powerlessness to alter software to address explicit issues. Open source exists as an announcement of opportunity of decision.

Brought together administration: Specific open source advancements like CIM (Common Information Model) and WBEM (Web Based Enterprise Management) give the ability to incorporate or unite worker, administration, application, and workstation the board for amazing organization.

Quality software: Evidence and exploration show that open source software is acceptable stuff. The friend survey interaction and local area norms, in addition to the way that source code is out there for the world to see, will in general drive greatness in plan and proficiency in coding.

II. OBJECTIVES

1. To understand the current status on Open source software (OSS) and OSS adoption in organizations.
2. To identify the factors influencing the adoption of OSS in IT outsourcing organizations serviced by Indian IT service providers.
3. To develop a tool to predict the OSS maturity and adoption level for any given client organization.

III. CONCLUSION

The factors that were identified as inhibitors in OSS adoption and consistent with the survey and qualitative study are as follows: License and legal concerns, Size. Further, qualitative study provided additional insights into the OSS adoption by identifying other factors that hinder OSS adoption, viz., vendor lock-in, internal resistance, and lack of support. The finding regarding IT Outsourcing per se as a factor was consistent in both survey and qualitative study, and it has little or no impact on OSS adoption. Furthermore, qualitative study provided additional insights into the OSS adoption by identifying other factors that do not impact OSS adoption (budget constraints, source code availability, and trialability). High adoption was seen in Europe across all sizes or organization except very small organization.

The impact of size on adoption was not constant and different in each geo based on the sectoral influence. While organizations in Europe adopted OSS for cost savings and better performance, organizations in North America and Rest of world adopted primarily for cost savings and easier maintenance/better skillset. While organizations in BFSI sector, adopted OSS due to performance, rest of the sector did not do so. While organizations in North America and Rest of World saw benefits to reach a larger market segment and extend geographic coverage, this was not seen in Europe and Asia Pacific geographies. While organizations in BFSI, Healthcare, Hi-tech/Telecom saw benefits to reach a larger market segment and extend geographic coverage, this was not seen in rest of sectors.

Over 80% of the survey respondents were employees of top 20 Indian IT service providers, where researcher had access to the sample population. Given that, the top 20 providers account for over 32% of total Indian IT-BPM sector revenue , the sampling is justified. Additionally, qualitative study research was conducted with a sample scope of recommended maximum number (ten) that helped to capture diverse and rich sources of information for this study

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