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FACTORS INFLUENCING SELECTION OF OPEN SOURCE SOFTWARE

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Abstract---*In the market of software today, software of open source has emerged as a competitor to proprietary software. In some countries, governments also give support to open source software due to its cost saving aspects and good supportability. The study aimed to enumerate the variables that affect the software of open source selection while comparing with proprietary software in the organizations of Malaysia. Data from different sources have been acquired while focusing primary as well as secondary sources. After the implication of certain techniques and methodologies, results elaborated the variables that significantly affect the software of open source adoption. It is also found that results might not serve as to be expected, where the adoption is somehow relevant to the Malaysian organizations extent.*

Keywords---*Software, Competitor, Countries, Malaysia, Techniques.*

I. Introduction

In the traditional software development process, some prominent contributors tried to acquire the complexity reduction. The first is the utilization of shrouded information consolidated in a module while group supervisors center on interfaces to advance its general execution and usefulness. Nest is the parceling of programming improvement into discrete advances that can be led consecutively or simultaneously (Batpurev & Ulaanbaatar, 2005; De Silva et al., 2018a; De Silva et al., 2018b; Nikhashemi et al., 2013). Both of the standards are utilized in OSS improvement. In any case, OSS profits by two wellsprings of proficiency gain. The first is the proficiency of actualizing generation in a disseminated network of training that licenses clients as givers. Second is the simultaneous investigation and plan once more. It will be a standard practice for programming houses to discharge beta variants of their item, while the arrival of the open source code would then be able to be fused into authentic discharge in the later stage. Today, every computer user with different level of skills is allowed to join the project anywhere anytime just by downloading the source code and implement it for better result and performance. These contributors are working under a "virtual community" where every modification, implementation, and correction is shared via the Internet (Amollo, 2013; Dewi et al., 2019; Pambreni et al., 2019; Tarofder et al., 2017). Mention that the reasons to contribute to OSS project for free are either because of their own hobby and interest or they just want to spend their free time working on a more meaningful activity. However, there are some companies which sponsor OSS projects and pay the developer on a full time basis. In general, the principle of OSS is to make the source code available to everyone.

The vast majority of these advancements were created at colleges and computer organizations examine research centers, where the UNIX was created on the grounds that the sharing of the source code among programming was under typical (Poizat & Salaün, 2007). As a result, it has also made them one of the factors for the emerging networks of computer such as net use, which was established to link with the community of UNIX again. From the business point of view, the FSF is regarded as anti-business. At the end of 1997 or beginning of 1998, a group of FSF's community leaders has discussed ways

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to promote FSF concept to a wider community. The word "Open Source" actually came from them while the work started to define the standard of OSS. A good way to determine OSS is to observe whether its background and processes are different from the software. In current day industry of software, organizations financial rewards of individuals from their "packaged" product for two mean principles, firstly the agreements of user licensing in software industry are based on the copyright law. The purpose of a software license is to provide usage of legal rights of such groups and individuals software of computer for returning fee of license. In the real life situation, a license of software usually restrains the computer numbers to execute the program, number of users, and backup functions (Graf & List, 2005). Referenced that the expressions of Open source or free programming are not explicit enough to portray a specific programming permit, the most significant region of the copyright in the business product is the replicating products, dispersion and arrangement determined. Fundamentally, there are some basic things in the OSS licenses which are the right to acquire permit expenses and the condition that the source code is made accessible.

Linux as created as an open source working framework by Linus Torvalds, a student of software engineering from Helsinki college in 1991. Later on, rendition 1.0 was discharged dependent on a part created a code from the GNU venture in 1994. Accordingly, Linux is under the permit of GNU GPL. The Apache (Hyper content exchange convention) HTTP server venture was grown initially dependent on the open source server from the National place for supercomputing application (NCSA). It could be duplicated and changed for nothing out of pocket gave that NCSA would be advised about its subordinate work. Computer clients who claim a site must have web server program, for example, Individual web server, Deb Data Administrations, Apache and other (Dalpiaz, Chopra, Giorgini, & Mylopoulos, 2010). During the early development phases, Apache is also called as a "patchy" server because it is always being patched with new features and fixes. In 1995, the project of Apache was started and released its version 1.0 on 1 December 1995. At first, it used to fix an NCSA program by a group of people. Later on, they became known as webmaster and started OSS projects at commercial enterprises. This unique gathering comprised the Apache center which is liable for the essential advancement of Apache HTTP server program.

While some of the big firms such as Oracle and IBM are more on Linux, it would give a certain level of impact to Microsoft. Although MySQL may not have much features compared with Microsoft, IBM and Oracle but it enables a very good support processing transaction and is going to get attention from large players. From Berlecon Research GmbH, Larry Wall was developed the Perl in 1987. During the time, it went about as an apparatus for looking, controlling and printing writings. Later on, the scripting language Perl was developed into a system and framework organization apparatus (Pizka, 2004; Doa et al., 2019; Maghfuriyah et al., 2019; Nguyen et al., 2019). It also came out with the Common Gateway Interface (CGI) programming which was used for the Internet for dynamic web pages. The objectives of this research are to, identify the dimensions of the different factors faced in adopting OSS software by Malaysian users in business organizations, compare the result of adoption of OSS with other countries to determine whether Malaysia is lacking behind. All man revised the program in 1993 as there existed numerous forks and prevailing with regards to rejoining the networks. Inc to offer business rendition of sendmail, including overseeing devices and security arrangements, in a brief timeframe, sendmail ruled the market by coming to now and again with a piece of overall industry of 80 percent of mail conveyed by means of sendmail.

II. Literature Review

In the software industry, there are several important software forms which include classical proprietary or commercial software, shareware, freeware, and OSS. From Berlecon exploration GmbH, traditional exclusive or business programming is that is ordinarily conveyed under twofold structure, just however the source code is not given. A shareware is programming which offers a free preliminary for a specific period. If the user is satisfied with the program then he/she has to buy it as a

complete version without any time limit without providing source code (Abeywardena, 2012a; Pathiratne et al., 2018; Rachmawati et al., 2019; Seneviratne et al., 2019; Sudari et al., 2019; Tarofder et al., 2019). However, software of freeware is without any license fee. Meanwhile, OSS comes along with its source code. OSS can be divided into commercial OSS and non-commercial OSS. An OSS can usually be downloaded from the Internet. Clients can utilize, alter and redistribute the product under OSS. Anyway there is a rich scene of OSS licenses, which diverse as far as business use, rights and some different angles. Later on, the OSI built up the open source definition OSD. It's anything but a permit entirely a rule and trademark for OSS programming licenses other than the GPL. Right now, it gave a few certifications of a few opportunities to programming clients including business clients (Fauve, Matrouf, Scheffer, Bonastre, & Mason, 2007; Nikhashemi et al., 2017; Tarofder et al., 2019; Ulfah et al., 2019; Tarofder et al., 2016; Udriyah et al., 2019). So as to raise the significance of OSS in the business world, the word open source has been utilized rather than free programming.

In the aspect of security, insists that OSS considered being less strange than proprietary source code is available in OSS and proprietary software hides the code. Therefore, vulnerabilities and bugs can be identified and fixed quickly. Some of the proprietary software even created "backdoors" intentionally and also with some conventional bugs which are not perceivable (Robinson & Beecham, 2019). Besides, OSS developers are actively checking the security gaps and always aware of those security problems with possible remedies, making them public immediately once it has found the solutions. The permit may limit source code from being conveyed in altered structure just if permits the dispersion of fix documents with the source code to adjust the program at manufacture time. The permit should unequivocally allow dispersion of programming worked from altered source code. The permit may require determined attempts t convey an alternate name or form number from the first programming.

If an organization lacks source code access to mission critical software it would exposes itself to unnecessary risk. By having the program source code in OSS, it gives the control to customers over which their business rely on (Jankowska, 2007). At the same time, they can decide whether to maintain the software by them or by hiring consultants to make the software better and to suit their needs and wants. In the proprietary model, this thing never exists unless the customers pay a certain amount of money or negotiate with them. At times, client with strangely money related influence dangers disturbance because of a customary programming merchant's inner issues or securing by another organization (Fraser et al., 2012). The rights appended to the program must not rely upon the programs as a rule some portion of a specific programming circulation. On the off chance that the program is extricated from that conveyance and utilized or appropriated inside the details of the programs permit, all gatherings to whom the program is redistributed ought to have indistinguishable rights from those that are allowed related to the first programming dispersion.

Since the proprietary software does not provide the source code, it probably has many hidden bugs and backdoors. A source code is significant for troubleshooting and seeing how a program functions. In huge programming organizations, the entrance over the source code is just possessed by barely any representatives who are once in a while accessible straightforwardly to clients. The entrance to source code is additionally fundamental for finding and fixing bugs, security escape clauses and other once more (Abeywardena, 2012b). Conformant licenses must consider the likelihood that (a) redistribution of the product will happen over non web channels that don't bolster clock wrapping of the download, and that (b) the secured code may run in a non-GUI condition that can't bolster popup exchanges. A portion of the restrictive programming merchants contend that OSS designer has no assurance over the security of the item (Pavlik, Maass, Rus, & Olney, 2012). In any case, the permit state of restrictive programming as a rule prohibits any issues in regards to obligation coming about because of harms emerging from security holes inside the product. What's more, barring the chance of an open review of the code by the logical and designer's locale, exclusive programming makers as a rule incorporate non revelation provisos in the permit understandings. The quantity of conveyed pre introduced machines is definitely not an indication of

the base for the pre introduced working framework either OSS or exclusive programming (Valetto & Kaiser, 2003). Those computers pre-introduced with windows may move to Linux because of certain reasons. Then again, old computers can regularly be reused with Linux and OSS instead of an expensive update or move to a more up to date form of restrictive working framework and application. Additionally, the equipment prerequisites for OSS are a lot of lower contrasted with exclusive programming.

The Internet and web services may not be available or highly demanded by users if TCP/IP and XML are not available. Additionally, the OSS improvement approach is more law based than exclusive programming, and the discussion are from the general population. For the most part, OSS people group will in general control itself and spotlight on longer term instead of transient objectives. Moreover, OSS ventures will be progressively straight forward and incorporates increasingly point by point guides dependent on the criticism from different gatherings (Oreizy, Medvidovic, & Taylor, 2008). OSS designers are basically persuaded by energizing or potentially imaginative programming improvement and this would make them be less propelled in creating documentation that business purchasers hope to see together with the product. Documentation actually is a must for all kind of software and whether OSS or proprietary software; developers should provide it along with its software itself. Suppliers and system integrators ought to be urged to increase the value of the OSS by passing that documentation retreat to the network (Satgunam, Gowrisankaran, & Fogt, 2009). Most of the projects of OSS have maintained an "Open Source Documentation" theme in order to provide full documentation of the software for ease of use.

Normally, Germany's approach towards OSS is abundantly determined by cost sparing and practically study on their undertaking. Germany was ranked as the biggest or second largest OSS community based on the results from different kind of surveys (Hochwarter, Atkins, Diwan, & Zary, 2017). In Germany, government organizations are showing a great interest to support OSS in the public sector. With the for all intents and purposes arranged approach and the firmly expanding execution of OSS in the open establishment, it adds to an argumentation of OSS extends outside the open part in Germany, this have a solid effect in the private segment on the utilization of OSS once more (Carreras, Chao, Padró, & Padró, 2004). However, users should have to know that free software is different from OSS. Now and again, free programming is conveyed in parallel or aggregated structure similarly as what has been done in exclusive programming. Furthermore, with the more noteworthy utilization of OSS may emerge from the weight that OSS's lower authorizing costs put on exclusive programming permit. It is more customizable for different user needs compared to proprietary software. For example, Opera internet browser is the fastest and most customizable browser in the world. It allows user to change their needs from time to time (Gomaa & Hashimoto, 2011). With the expense of OSS and the capacity if the client to proceed with redesign and improved from later on, the all out expense of responsibility for longer period is a lot of lower than for exclusive programming, as overhauls and upgrades are not required to pay for and authorized. The expanding number of OSS clients is certifiably not an exorbitant issue any long; in this way the expense of relocating is alleviated and spread out over the client base consequently lessening time.

Oracle is one of the main business programming suppliers to concentrate on Linux with help for the Oracle 9i database, Oracle 9i application server, Pravle9i designer suite, and Oracle e business suite, it worked with red cap during the improvement of their propeller server (Lixandrão Filho et al., 2009). Those clients who use Oracle on Linux incorporate the government flying organization with a 5 node RAC data base and European community for Atomic Exploration CERN which tried 9 node RAC database and getting ready for additional arrangements. As Oracle support in Linux, many companies would decide to use it due to its reliability and security in the database which is critical for some companies such as Banks. Until today, majority of the Malaysians are still using proprietary software including operating system, databases, web servers, and others. The way that this exclusive programming is available implies that the nation has basically nothing to do with the advancement and heading of the product (Bakar, Sultan, Zulzalil, & Din, 2018). Another point is local and

Asian produced proprietary software is very few and limited compared to US and European countries. By using and encouraging more people to use OSS, it will cause Malaysia less subject to programming and advancements where Malaysians to have no control. It additionally will affect the product if Malaysia takes and interest effectively in OSS advancement and utilization (Valetto, Kaiser, & Kc, 2001). While, an implicit benefit if OSS lies within the realm of national security in all kinds of industries, by using OSS, it will permits government and national key interests to guarantee that there are no concealed bugs, indirect access, or deformities inside the innovation. Just by sending OSS which has been peer assessed and affirmed liberated from any concealed stun, the country is just ready to guarantee the security of the nation's processing and data resources just as be appropriates ensured against demonstrations of animosity and digital fighting.

HP's open source strategy was centered on Linux. Most of the sales from HP are from solutions such as combination of hardware, operating system, and software as packages. These arrangements are offered to its client over a few stages and furthermore give Linux in those interest advertise like programming parts that streamline the utilization of Linux on HP's equipment. By having a few options of specialized help and support choices for OSS advancements, it very well may be bought from trustworthy or notable organizations (Galatescu, Florian, Costea, & Conescu, 2003). Also, because of the way that the source code is generally accessible and any skillful organization is in a situation to offer specialized help, clients are not stayed with buying bolster choices from just organizations. As a result, it will have more companies offering this kind of services and maintenance for OSS in the future and users will be required to pay a certain amount of money on it and could make OSS not really free anymore. OSS is based on the contribution of the user, developer, programmer in different regions and locations around the world. So, OSS does not have a clear direction or roadmap for product in order to have a future plan (Bonaccorsi & Rossi, 2003). While the main OSS merchants have details and plans that diagram the different activities, the code by board approach may not line up with the objectives of a specific venture.

Sun is another organization which is very active in free and open source projects, including Open Office from its office suite Mozilla, X windows, Net Beans, Apache, GNOME, WBEM source initiative, Star Office and others. They have wagers on the Linux working framework and will send an expanding assortment of equipment with Linux (Dingsøyr, Moe, Fægri, & Seim, 2018). As in GNOME, a work area for Linux which will supplant Sun's basic work area condition (CDE) on its Solaris prepared computers. These GUI generally mind boggling, hard to program and keep up however includes a low incentive inside the all out item bundles in the server showcase. Occasionally, sun is encouraging its improvement and causes in improving Linux to be an option to Microsoft Windows and debilitating Microsoft's market position in a roundabout way (Moulla, 2013). Plus, limitation of OSS in the different significant dialects ought to likewise advance the utilization of innovation with organizations of optional a tertiary training in Malaysia. As of late, the service of vitality, correspondences and mixed media (MECM) Malaysia has started the one home one Computer venture, as a team with relationship of the computer and mixed media industry of Malaysia (PIKOM). PIKOM started promote OSS by selling "PC Gemilang" few months ago and has received a good feedback and response from the users by selling. According to famous local newspapers, TheStar, "PC Gemilang" project comes with two models.

Following are the hypothesis of this study;

H1: Access Source Code, Functionality, Avoid single vendor lock-in, increase I.T. knowledge skills impacts on adoption of open source software

H2: Cost reduction, technical support impacts on open source software

III. Research Methodology

This study adopts a survey approach in order to analyze the variables which are affecting the selection of OSS in Malaysian companies. A total of 200 questionnaires have been distributed to different company's CEO and I.T. staff. 128 questionnaires

from 45 companies were returned, presenting a response rate of 70%. However, 12 participants have returned an incomplete form which is not able to analyze for this study. The organizations in were Malaysia from different states and industries. The sectors included such ones as insurance, banking, government, education and information technology. Both data will be collected in this study whether secondary or primary. Data of secondary base will be taken from various sources about OSS adoption in different countries. Primary data about the various issued related to adoption and problems of adopting OSS will be collected from a sample of Malaysian business organizations. Data will be collected from personal interview with a questionnaire in hard copy form and also form an online format. While some independent variables to check the effect are access source code, functionality, avoid single vendor lock-in, increase I.T. knowledge skills, cost reduction and technical support while dependent variable is Adoption of open source software compared with Proprietary software.

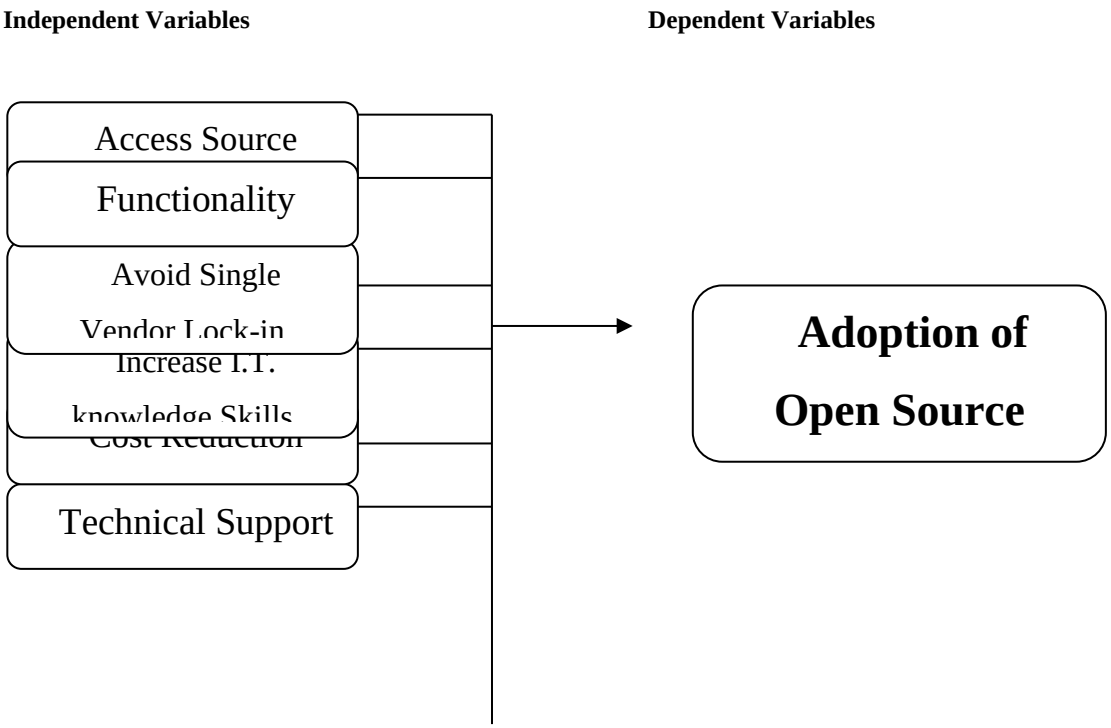

Figure 1: Dependent & Independent Variables

Some assumptions are made that the data and information that gathered regarding its usage, benefits, drawbacks, I.T. personnel, data collection methods, and the methods used to present the findings including in the review of related literatures will be valid and correct to provide the writer the necessary knowledge to develop, instruct, and implement this study.

Data Analysis

In this study, data and information on the adoption of OSS in Malaysian organizations were gathered among different kinds of users, companies, and industries. The data were collected from questionnaires and secondary sources.

Problems faced in OSS and proprietary software

Table 1: Independent t-test for problems faced in PS for both gender

	Male			Female		
	N	Mean	Std. Deviation	N	Mean	Std.
PS_Less_Func	**83**	2.5060	.92885	**32**	2.9063	.68906
PS_Low_Perfm	**83**	2.6627	.95352	**32**	2.7500	.50800
PS_Security	**83**	3.3373	1.05087	**32**	3.1875	.69270
PS_Cost	**83**	3.9639	.83295	**32**	3.5938	.83702
PS_Prod	**83**	2.7349	.85660	**32**	2.9375	.56440
PS_Update	**83**	2.5060	1.01661	**32**	2.8125	.82060
PS_Slow_Update_Cycle	**83**	2.9157	1.03835	**32**	3.0000	.71842
PS_Access_Source_Code	**83**	3.0843	1.40734	**32**	2.8125	.93109
PS_Knowledge	**83**	2.9518	.77936	**32**	3.0625	.50402
PS_Trainning	**83**	3.0000	.85540	**32**	3.0938	.58802
PS_Choices	**83**	3.0000	.82639	**32**	3.0938	.39015
PS_Unsure	**83**	3.0241	.78049	**32**	3.0938	.46555

Table 2: Descriptive statistics for problems faced in PS for both gender

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PS_Less_Func	115	1.00	5.00	2.6174	.88439
PS_Low_Perfm	115	1.00	5.00	2.6870	.85188
PS_Security	115	1.00	5.00	3.2957	.96404
PS_Cost	115	2.00	5.00	3.8609	.84694
PS_Prod	115	1.00	5.00	2.7913	.78913
PS_Update	115	1.00	4.00	2.5913	.97239
PS_Slow_Update_Cycle	115	1.00	5.00	2.9391	.95777
PS_Access_Source_Code	115	1.00	5.00	3.0087	1.29436
PS_Knowledge	115	1.00	5.00	2.9826	.71307
PS_Trainning	115	1.00	5.00	3.0261	.78875
PS_Choices	115	1.00	5.00	3.0261	.73103
PS_Unsure	115	1.00	5.00	3.0435	.70576
Valid N (listwise)	115				

For proprietary software, the top three problems faced by male users are increasing cost, weak security, and unable access into source code with a mean of 3.9639, 3.3373, and 3.0843 respectively. However, top three problems faced by female users are increase cost and weak security with a mean of 3.5938 and 3.1875. Lack of trainings, lack of software choices, and unsure correct software to use are having an equal mean of 3.0938. These problem faced by proprietary software are co-related with each other.

On the other hand, the three problems that are least faced by male users are less functionality and unable update online with an equal mean of 2.5060. It followed by low performance with a mean of 2.6627. While the bottom three problems faced by female users are low performance with a mean of 2.7500; this followed by unable update online and unable access into program source code with an equal mean of 2.8125.

Table 3: Independent t-test for problems faced in OSS for both gender

	Male			**Female**		
	N	**Mean**	**Std. Deviation**	**N**	**Mean**	**Std.**
OSS_Less_Func	**83**	3.2048	.97229	**32**	2.9063	.89296
OSS_Low_Perfm	**83**	2.7349	.84224	**32**	2.8125	.78030
OSS_Security	**83**	2.9157	1.05003	**32**	2.8750	.87067
OSS_Cost	**83**	2.4699	1.00411	**32**	3.0938	.89296
OSS_Prod	**83**	2.7349	.79762	**32**	3.0000	.67202
OSS_Update	**83**	2.9036	1.00747	**32**	3.0000	.84242
OSS_Slow_Update_Cycle	**83**	2.9036	.94501	**32**	3.0938	.68906
OSS_Access_Source_Code	**83**	3.1205	1.27258	**32**	3.3125	.93109
OSS_Knowledge	**83**	3.3012	.95936	**32**	3.2813	.72887
OSS_Trainning	**83**	3.4217	.92553	**32**	3.3125	.82060
OSS_Choices	**83**	3.3133	1.05839	**32**	3.1250	.79312
OSS_Unsure	**83**	3.3494	.88942	**32**	3.5313	.67127

Table 4: Descriptive statistics for problems faced in PS for both gender

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
OSS_Less_Func	115	1.00	5.00	3.1217	.95649
OSS_Low_Perfm	115	1.00	5.00	2.7565	.82282
OSS_Security	115	1.00	5.00	2.9043	.99977
OSS_Cost	115	1.00	5.00	2.6435	1.01040
OSS_Prod	115	1.00	5.00	2.8087	.77114
OSS_Update	115	1.00	5.00	2.9304	.96174
OSS_Slow_Update_Cycle	115	1.00	5.00	2.9565	.88249
OSS_Access_Source_Code	115	1.00	5.00	3.1739	1.18663
OSS_Knowledge	115	1.00	5.00	3.2957	.89809
OSS_Trainning	115	1.00	5.00	3.3913	.89536
OSS_Choices	115	1.00	5.00	3.2609	.99196
OSS_Unsure	115	1.00	5.00	3.4000	.83561
Valid N (listwise)	115				

For OSS, the top three problems faced by male users are lack of trainings, unsure which software to use, and lack of software choices with a mean of 3.4217, 3.3494, and 3.3133 respectively. While top three problems faces by female users are unsure which software to use with a mean of 3.5313; this followed by accessing into source code and lack of trainings with an equal mean of 3.3125.

However, the bottom three problems faced by male users are cost with a mean of 2.4699 and followed by low performance and low productivity with an equal mean of 2.7349. Besides, the bottom problems faced by female users are low performance, weak security and less functionality with a mean of 2.8125, 2.8750, and 2.9063 for each.

Software usage in OSS and proprietary software

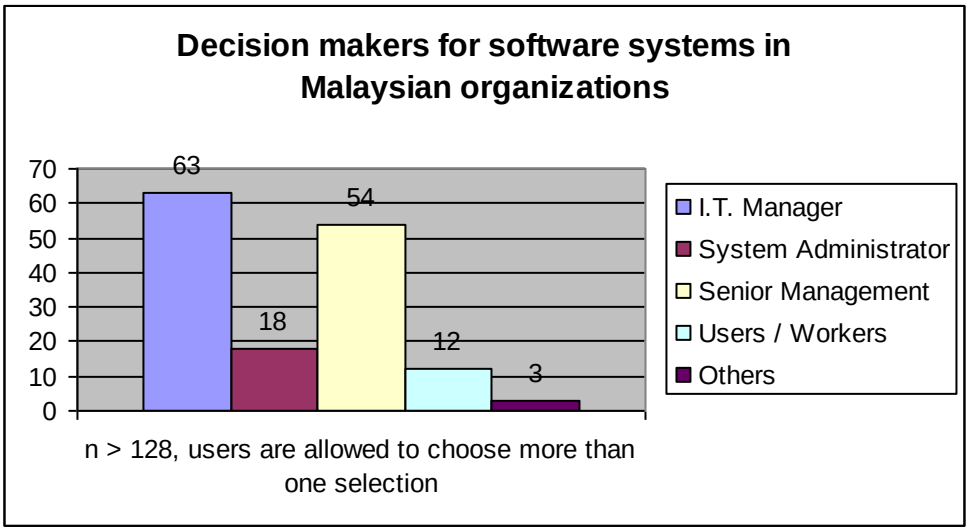

Figure 2: Decision makers for software systems in Malaysian organizations

The results from this survey shows that software decision for 63 or 42% of the respondent is under the I.T Manager, followed by Senior management with 54 respondents or 36%, 18 respondents or 12% under System administrator, 12 respondents or 8% under users and workers and only 3 respondents or 2% are decide by other party from the available selection included project leader, project manager, and by self.

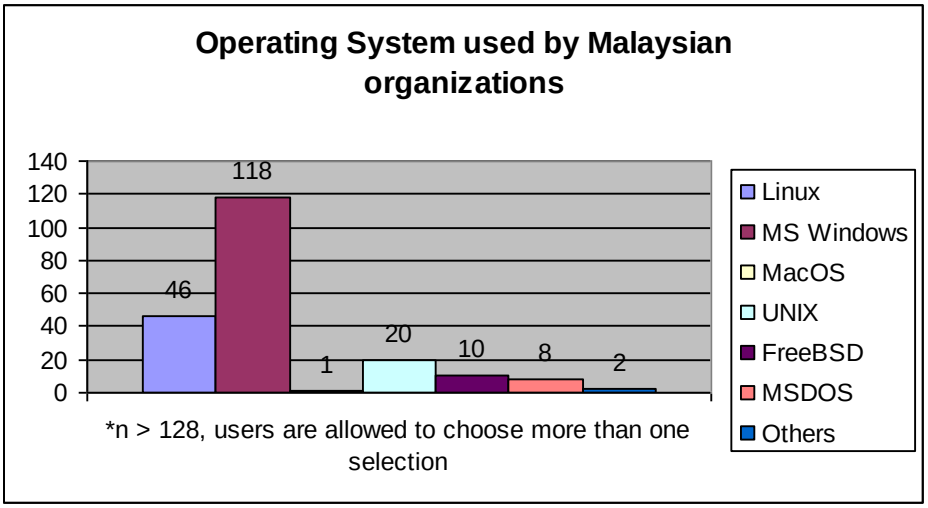

Figure 3: Operating System used by Malaysian organizations

Most of the people are using Microsoft Windows operating system with 118 respondents or 57.84%. Next, it followed by Linux with 46 respondents or 22%, UNIX with 20 respondents or 9.80%, FreeBSD with 10 respondents or 4.90%, MSDOS with 8 respondents or 3.92%, and MacOS with 1 respondent or 0.49%. Besides, 2 respondents or 0.98% are using other operating system included AS400 and OS 390.

Factor analysis

The following presents the results of the factor analysis.

Factor analysis of opinions toward OSS

Table 4: Summary of rotated component matrix for opinions toward OSS

Name of variables	**Factor 1**	**Factor 2**	**Factor 3**
	Product features	**OSS market prospect**	**Lack of software choice and improvement**
OSS stability	0.651		
OSS security	0.538		
OSS functionality	0.706		
OSS user friendly	0.720		
OSS user support	0.819		
OSS replace PS	0.665		
OSS better than PS	0.621		
OSS ROI		0.691	
OSS advertisement		0.610	
OSS best alternative		0.761	
OSS high growth rate		0.752	
OSS less choice			0.744
OSS needs improvement			0.751
Eigenvalues	4.413	2.168	1.266
Variance	33.948	16.680	9.738

By referring the output of factor analysis, it shows that factor 1 account for 33.948% of the variance, while factor 2 and 3 were 16.680% and 9.738% respectively. All this three factors' variances accounted for a total of 60.366% of the total variance.

F**actor analysis of criteria of selecting software**

Table 5: Summary of rotated component matrix for criteria of selecting software

Name of variables	**Factor 1**	**Factor 2**	**Factor 3**
	Product features	**User knowledge and vendor related**	**Cost saving and user support**
User friendly	0.663		
Reliability	0.896		
Stability	0.889		
Security	0.801		
Interoperability	0.708		
Access source code		0.713	
Functionality		0.742	

Avoid single vendor lock-in		0.865	
Increase I.T. knowledge/skills		0.838	
Cost reduction			-0.524
Performance / speed			0.645
Technical support			0.708
Eigenvalues	4.959	2.113	1.175
Variance	41.324	17.608	9.791

By referring the output of factor analysis, it shows that factor 1 account for 41.324% of the variance, while factor 2 and 3 were 17.608% and 9.791% respectively. All this three factors' variances accounted for a total of 68.723% of the total variance.

Factor analysis of problems faced in adopting OSS

Table 6: Summary of rotated component matrix for problems faced in adopting OSS

Name of variables	**Factor 1**	**Factor 2**	**Factor 3**
	Product features	**Productivity and product supportability**	**Knowledge, training and choices for software**
OSS less function	0.775		
OSS low performance	0.742		
OSS security	0.542		
OSS cost	0.552		
OSS access source code	0.457		
OSS productivity		0.649	
OSS update online		0.821	
OSS slow update cycle		0.677	
Less choice in OSS		0.672	
Lack OSS knowledge			0.813
Lack OSS training			0.844
Unsure OSS product to use			0.605
Eigenvalues	4.191	1.673	1.338
Variance	34.929	13.945	11.152

By referring the output of factor analysis, it shows that factor 1 account for 34.929% of the variance, while factor 2 and 3 were 13.945% and 11.152% respectively. All this three factors' variances accounted for a total of 60.026% of the total variance. It explains that the product features, productivity and product supportability, and knowledge, training, and choices for software are important problems faced in adoption of OSS.

IV. Conclusion

Nowadays, cost involved in organizations is getting higher, a lot of companies are always thinking on cost reduction in their businesses. As one of the main benefits of shifting proprietary software to open source is cost saving, this may give an idea of them to think of doing this. With low permitting charges, utilizing product equipment and keeping away from programming lumbering programs authorizing the board forms were the most regularly distinguished advantages of utilizing open source arrangements. As in this survey result shows that both gender are agree that high cost is a problem for an organization, especially for an organization that involved hundred or even thousands of original proprietary software. If it shifted their software system to OSS, this amount can be saved of other expenses. From here we can see that the differences of choosing OSS over proprietary software in terms of cost saving. Surprisingly, the result from this research shows that Malaysian are not care about accessing into source code and they are very seldom perform any changes of the program source code or even software configurations. As the result shown in this survey, it found that Malaysian is preferred to use Microsoft IIS over Apache. Just because of this, this result also shows that the used of ASP also higher than PHP since ASP only can be work perfectly under Microsoft IIS environment. A company may not be aware that a particular open source product able to meet their needs and expectation. This statement fully expresses the view and feelings of Malaysian OSS users. This is important for OSS users, non-OSS users, and organizations in Malaysia because one of their main criteria for selecting software is judge by its reliability based on the result from this research.

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