

CHAPTER 5: CONCLUSIONS and RECOMMENDATIONS

5.1. Results

There are very large cost advantages to be gained by Sri Lankan organizations by migrating to FOSS. Sunk costs on software already purchased are minimal because many organizations are still using unlicensed software. This study shows that a minimum of Rs 86,000 per computer can be saved compared to costs of using proprietary licensed software. For just the sample of 30 companies analysed in this study, the total cost of licenses amount to 1 billion rupees. This is money that is going out of the country. By using FOSS the organizations save 86% of this bill while the remaining costs is absorbed by other Sri Lankan organizations providing support services.

The costs which were factored in as costs on FOSS are valid only for the starting stages in the country. The cost differences are almost fully in the area of training for which the organizations would have to pay if using Linux. For Microsoft products the knowledge was presently assumed to be available in people so that the organizations do not have to send them for special training. But once Open Source has been around for one or two years – the necessity for such costs disappear, making the cost difference even greater.

There are FOSS equivalents for all the most commonly used software included in this calculation (ie. software that was installed in more than 100 computers within the sample.) It should be however noted that they entail varying levels of user friendliness & ease of use compared to their proprietary counterparts although they can perform the task once a user learns how it done. FOSS has improved drastically in this area in the last 2 years & it is very likely that the situation will improve very rapidly. 89% of the installations consisted of software that could be replaced with efficient FOSS software that are commonly accepted as user-friendly FOSS applications at the present time.

5.2. Recommendations for Government Involvement

The study showed that the amount of knowledge about Open Source among people is extremely poor and that they are not updated in it. Many organizations will choose proprietary software mainly due to this lack of awareness. Therefore this lack of awareness will cost the country a very large amount of money. The author recommends that the Government step into the picture to encourage wide scale Open Source usage.

Government should design a master plan showing steps and requirements for going forward in advocating wide scale use of Open Source software and ensuring sustainability of such software use. The following should be taken as aims in such an effort:

- a. Increase the common knowledge in IT people of what Open Source software is available for use.
- b. Make such software and their updates readily and easily available.
- c. Make training on using Open Source software readily available
- d. Create organizations to provide software support and guidance (Help desks, bug fixing and releasing upgrades)
- e. A multi faceted effort to promote the use of OS software is also needed and regarded as part of this “infrastructure” that needs to be set up – as it helps to achieve economies of scale which will reduce overall costs.

A Research Organization should be set up with a team of software specialists studying the various options available and the latest developments taking place around the world and making timely recommendations and information releases on which software to choose, upgrades available, new features improvements available etc. This will help organizations make better decisions and also be more productive. This organization should also provide consultancies to interested businesses who need information in starting up or migrating to Linux.

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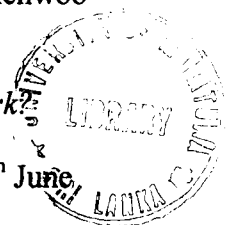
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Annex 1: Questionnaire

Please note: Original questionnaire was in colour to make it look attractive and increase the probability of response. Most responses were sought electronically and the questionnaire was optimized for easy and quick answering using advanced form features such as tick boxes, option buttons, input boxes and locking of other areas which are not for inputting responses etc.

Study on Open Source Software Usage in Sri Lanka

Survey Conducted as part of the Research module in the MBA programme at Moratuwa University.
Student Name: Shermal Karunaratne

Please send your replies and/or queries to shermal@ips.lk. The details from this survey will be used solely for academic purposes & will not be quoted in a manner which would identify the company or the respondent.

Instructions:

Item marked (optional) & colored in green can be left out if you do not want to divulge the information

Please include your own items/categories/comments in the spaces left blank & colored in blue

Please use the mouse to click on the tick boxes & option buttons - keyboard may not work with these

If more space is needed please use the "Additional Space" Sheet to answer - you can insert rows in this sheet

1 Name of Company: (optional)

2 Nature of Business:

2.1 Organisation Type: Government Private

	Currently	In 3Yrs	In 5Yrs	
3 Number of staff				(Approximate number)
4 Number of IT staff				
5 Number of Computers				(Approximate number)
5.1 Servers				
5.2 Desktops				(Approximate number)

6 Have you heard about open source Software? (Yes/No)
(if NO read brief intro about Open Source Software at the end of the document)

7 Have you used/tried any open source Software? (Yes/No)
(if your answer is NO skip Q8 & goto question 9)

8 Please name open Source software being used & no. of computers its installed on:

	Name of Open Source Software (If you don't know the name, please enter the type of software- eg Video Editing..)	Tried it?	No of computers installed (If its being used)
8.1	Linux Distribution (eg. RedHat, Debian)	<input type="checkbox"/>	
8.2	Apache (Web server)	<input type="checkbox"/>	
8.3	Squid (Proxy Server)	<input type="checkbox"/>	
8.4	MySQL (Database)	<input type="checkbox"/>	
8.5	PostgreSQL (Database)	<input type="checkbox"/>	
8.6	iptables (Firewall)	<input type="checkbox"/>	
8.7	SendMail/PostFix (Mail servers)	<input type="checkbox"/>	
8.8	KDevelop (IDE)	<input type="checkbox"/>	
8.9	GIMP (Graphics)	<input type="checkbox"/>	
8.11	Open Office (Productivity Suite)	<input type="checkbox"/>	
8.12	OSCommerce (e-Commerce suite)	<input type="checkbox"/>	
8.13	other(Specify):	<input type="checkbox"/>	
8.14		<input type="checkbox"/>	

9 Do you agree with the following statements about using Open Source Software (please tick according to level of agreement)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Answered
9.1 a	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.2 b	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.3 c	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.4 d	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.5 e	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.6 f	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.7 g	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.8 h	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.9 i	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.11 j	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.12 k	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.13 l	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.14 m	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.15 n	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.16 o	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
9.17 p	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

10 Software currently being used in your company

	Number of computers installed	Minimum Number essential to carry out the work of the company	Number of Licensed copies
Word Processing/Publishing			
MS-Word			
MS-Publisher			
Adobe PageMaker			
Word Perfect			
Adobe Acrobat Reader			
Adobe Acrobat Distiller/Writer			
Spread Sheet			
Lotus123			
Excel			
Presentation			
MS-PowerPoint			
Adobe Illustrator			
Macromedia Director/Authorware			
DataBase			
MS-SQL Server			
FoxPro			
MS-Access			
Oracle			
Internet / Web authoring			
MS-Internet Explorer			
FrontPage			
DreamWeaver			
Netscape/Mozilla			
Opera			





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	Windows2000 Professional		
	Windows98		
	WindowsXP		
	Sun O/S		
	Apple Macintosh		
	Windows95		
	WindowsNT		
Server Software			
	Windows2000 Server		
	Windows2000 Advanced Server		
	Win 2003 Server		
	Mail - MS Exchange		
	Firewall- Sunscreen		
	MS Internet Information Server		
	MS - ISA server		
	Firewall- Astaro		
Antivirus			
	Norton Symantec		
	Mac Affee		
	InoculateIT		
Statistical			
	Stata		
	Minitab		
	SPSS		
Video Viewers/Editors			
	Power Player		
	Adobe Premier		
	Ulead Video Studio		
Other			



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11 If it was impossible to use proprietary software unless you had to pay & get licenses. Would you -

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Answered
a Pay whatever it costs & get the licenses & continue using the same software?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
b Reduce the number of installations & use software on fewer machines so as to pay for fewer licenses but continue to use proprietary software.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
c Switch over to free/opensource software if there was no cost in retraining staff to use it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
d Retrain staff (one time cost) & use open source software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
e Use open source software even if prices of proprietary software was reduced.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Thank you for your time & support.

Introductions to terms used

OpenSource software

This is software for which the programme source code is also released to the public. These also happen to be largely free (cost-wise). You have the right to distribute or even modify the programme if you want. Eg. Linux, Apache, Open Office etc.

Proprietary software

Software from companies such as Microsoft, Corel, Adobe etc. for which a paid license is required for using. Re-distribution, modification, copying etc is prohibited.



Annex 2: Responses to Computer Vendors Mini Survey

	Name of Shop	Person	Tel no	Can Install Linux?	What Linux?	Comments
1	Data technologies:	Ravi	2853969	Yes	Redhat 9	
2	Epsi computer	Pradeep	2467723, 0773104309	Yes	Redhat 9	or any other-if you give CD
3	Kobian Computers	Ranil	565676	Yes	Redhat 9	
4	Neat	William	2508150	Yes	Redhat 9	
5	Silicon	Thushari	2504037	Yes	Mandrake	
6	Digital Base	Suranga	5348888	Yes	Redhat 9	
7	Softlogic	Kavinda	5575052	Yes	Redhat 9	Sell only Dell computers
8	Sherwoods	Rajkumar	2732913	Yes	Whatever Linux you specify	
9	Winsoft Information Systems	Hassen	5366166	Yes	Redhat 9	
10	ABC Computers	Dinesh	2691863	Yes	Whatever Linux you specify	
11	Data Master Computer systems	Peterson	2505479	Yes	Whatever Linux you specify	

Annex 3: Responses to IT Training Institutes Mini Survey

	Institute	Training on Linux administration	Training on Linux Desktop packages	Modules/Comments
1	Esoft Computer Studies (Pvt) ltd	No	No	
2	NIIT	Yes	No	
3	Singapore informatics	Yes	No	
4	IDM	Yes	No	Basic and Advance administration, Php and MySql training
5	Ssi	Yes	No	Basic Administration
6	OpenArc computer School	Yes	No	Linux basics and basic administration
7	Tec Sri Lanka	No	No	
8	Informatics(Pvt)Ltd	No	No	
9	Dana Institute of Software and technologies	No	No	
10	Cyber Concepts(Pvt) Ltd	No	No	
11	Harrow Computer Institute	No	No	
12	NIBM	Not Now	Not Now	<i>* the person who spoke didn't seem to know much - drop this record from any analysis.</i>



Annex 4: Statistical Analysis

(i). Descriptive Statistics: Question 9 sections (a) – (n)

Variable	N	N*	Mean	SE Mean	StDev	Sum	Median
9.a)NotTriedFind	32	4	3.063	0.242	1.366	98.000	3.500
9.b)WantFindButNot	30	6	2.867	0.178	0.973	86.000	3.000
9.c)NotAvail	31	5	3.613	0.158	0.882	112.000	4.000
9.d)Diffclt_Install	31	5	3.548	0.173	0.961	110.000	4.000
9.e)Diffclt_Try	28	8	3.571	0.158	0.836	100.000	3.500
9.f)LotOfBugs	26	10	3.423	0.159	0.809	89.000	3.000
9.g)NotFriendly	27	9	3.074	0.150	0.781	83.000	3.000
9.h)NoDocus	25	11	3.000	0.173	0.866	75.000	3.000
9.i)WorksButNoLike	25	11	3.320	0.198	0.988	83.000	4.000
9.j)LikeButOrgDont	23	13	3.087	0.273	1.311	71.000	3.000
9.k)NoSupport	28	8	3.000	0.178	0.943	84.000	3.000
9.l)NoTraining	26	10	3.231	0.202	1.032	84.000	3.000
9.m)Incompatible	27	9	2.778	0.195	1.013	75.000	3.000
9.n)PoorSecurity	26	10	3.308	0.173	0.884	86.000	3.000

N= number of answered responses

N*= number of blank responses



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(ii). Regression Analysis: Tot.licenses versus Tot.Staff, Tot.IT staff & Tot.Computers

The regression equation is

$$\text{Tot.licenses} = -83 - 0.397 \text{ Tot.Staff} - 16.5 \text{ Tot.IT staff} + 7.81 \text{ Tot.Computers}$$

Predictor	Coef	SE Coef	T	P
Constant	-82.7	521.9	-0.16	0.875
Tot.Staff	-0.3973	0.3543	-1.12	0.271
Tot.IT staff	-16.51	24.93	-0.66	0.513
Tot.Computers	7.813	1.047	7.46	0.000

$$S = 2528.02 \quad R\text{-Sq} = 81.9\% \quad R\text{-Sq(adj)} = 80.0\%$$

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	864718988	288239663	45.10	0.000
Residual Error	30	191726454	6390882		
Total	33	1056445441			

Source	DF	Seq SS
Tot.Staff	1	186294292
Tot.IT staff	1	322685162
Tot.Computers	1	355739535


Unusual Observations

Obs	Tot.Staff	Tot.licenses	Fit	SE Fit	Residual	St Resid
11	4000	7645	18162	1557	-10517	-5.28RX
16	3500	27393	20314	1665	7079	3.72RX
19	100	0	-740	1796	740	0.42 X
30	6500	0	-2334	2204	2334	1.88 X

R denotes an observation with a large standardized residual.
X denotes an observation whose X value gives it large influence.

(iii). Regression Analysis: Tot.licenses versus Tot.Computers

The regression equation is
Tot.licenses = - 387 + 6.89 Tot.Computers



Predictor	Coef	SE Coef	T	P
Constant	-386.6	468.0	-0.83	0.415
Tot.Computers	6.8939	0.5934	11.62	0.000

S = 2515.46 R-Sq = 80.8% R-Sq(adj) = 80.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	853964388	853964388	134.96	0.000
Residual Error	32	202481054	6327533		
Total	33	1056445441			

Unusual Observations

Obs	Tot.Computers	Tot.licenses	Fit	SE Fit	Residual	St Resid
5	2000	18250	13401	1094	4849	
2.14RX						
11	2750	7645	18572	1513	-10927	-
5.44RX						
16	3000	27393	20295	1656	7098	
3.75RX						

R denotes an observation with a large standardized residual.

X denotes an observation whose X value gives it large influence.

(iv). Regression Analysis: Tot.Computers versus Tot.Staff

The regression equation is
 Tot.Computers = 115 + 0.272 Tot.Staff

Predictor	Coef	SE Coef	T	P
Constant	115.3	119.0	0.97	0.340
Tot.Staff	0.27214	0.07379	3.69	0.001

S = 629.157 R-Sq = 29.8% R-Sq(adj) = 27.6%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	5384309	5384309	13.60	0.001
Residual Error	32	12666821	395838		
Total	33	18051130			



Unusual Observations

Obs	Tot.Staff	Tot.Computers	Fit	SE Fit	Residual	St Resid
5	1500	2000	524	124	1476	2.39R
11	4000	2750	1204	268	1546	2.72RX
16	3500	3000	1068	234	1932	3.31R
30	6500	53	1884	443	-1831	-4.10RX

R denotes an observation with a large standardized residual.
 X denotes an observation whose X value gives it large influence.

(v). Regression Analysis: Tot.IT staff versus Tot.Computers

The regression equation is
 Tot.IT staff = 7.50 + 0.0302 Tot.Computers

Predictor	Coef	SE Coef	T	P
Constant	7.500	3.328	2.25	0.031
Tot.Computers	0.030160	0.004223	7.14	0.000

S = 17.9411 R-Sq = 61.5% R-Sq(adj) = 60.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	16420	16420	51.01	0.000
Residual Error	32	10300	322		
Total	33	26720			

Unusual Observations

Obs	Tot.Computers	Tot.IT staff	Fit	SE Fit	Residual	St Resid
5	2000	50.00	67.82	7.81	-17.82	-1.10 X
11	2750	100.00	90.44	10.79	9.56	0.67 X
14	46	65.00	8.89	3.26	56.11	3.18R
16	3000	100.00	97.98	11.81	2.02	0.15 X
19	90	80.00	10.21	3.20	69.79	3.95R

R denotes an observation with a large standardized residual.
 X denotes an observation whose X value gives it large influence.

(vi). Regression Analysis: Tot.IT staff versus Tot.Computers after removing 3 incorrect responses

The regression equation is
 Tot.IT staff = 1.89 + 0.0324 Tot.Computers

Predictor	Coef	SE Coef	T	P
Constant	1.889	1.202	1.57	0.127
Tot.Computers	0.032396	0.001456	22.25	0.000

S = 6.13655 R-Sq = 94.5% R-Sq(adj) = 94.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	18635	18635	494.87	0.000
Residual Error	29	1092	38		
Total	30	19728			

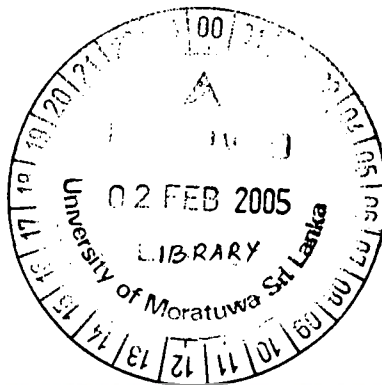
Unusual Observations

Obs	Tot.Computers	Tot.IT staff	Fit	SE Fit	Residual	St Resid
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4	2000	50.00	66.68	2.67	-16.68	-3.02R
10	2750	100.00	90.98	3.69	9.02	1.84 X
14	3000	100.00	99.08	4.04	0.92	0.20 X
20	500	35.00	18.09	1.13	16.91	2.80R
30	80	20.00	4.48	1.16	15.52	2.58R

R denotes an observation with a large standardized residual.
 X denotes an observation whose X value gives it large influence.




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