A Baseline Survey on Free and Open Source Software (FOSS) in the South Pacific: Knowledge, Awareness, and Usage.*

by

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*This report was prepared using free/open source software.

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1 EXECUTIVE SUMMARY

We report on the survey conducted by the researchers between January 10th, 2005 and April 29th, 2005. The survey's purpose is to determine the obstacles to maximizing the benefit of free and open source software (FOSS) for the Pacific island countries. A total of 467 structured interviews on knowledge, awareness, and usage of FOSS were conducted in the region. Our analysis identifies the following problems:

- general lack of awareness of FOSS applications, FOSS principles, and FOSS licensing
- lack of financial incentive to evaluate FOSS alternatives
- no stable, low-cost, and fast Internet access
- FOSS usage not integrated into government ICT strategy and policy
- migration difficulties, e.g. lack of user training facilities
- lack of support structure and catalyst
- curricula and education do not adequately integrate FOSS.

We recommend that:

- workshops for small business include training on FOSS applications, FOSS principles, and FOSS licensing are held
- industrial and professional organizations educate about risks due to changes in copyright laws, law enforcement and the FOSS alternatives
- regional organizations inform on proprietary and FOSS licensing
- information on FOSS is disseminated through the sources that proved good sources to increase awareness in our research
- USP strengthens information and education on FOSS and proprietary and FOSS licensing
- IT workers at all levels form a common forum for sharing FOSS information
- columns on FOSS are written by FOSS knowledgeable persons and published in PIC newspapers
- regional governments strive for cheap, reliable and fast Internet access comparable to developed nations
- PICs and ICT organizations support a regional FOSS repository distributed via DVD/CD for those without reliable Internet access
- FOSS developers are granted privileged Internet access
- government officials are educated on FOSS
- regional governments develop ICT strategy and (procurement) policies considering advantages and characteristics of FOSS

- a functional comparison of proprietary and FOSS applications, e.g. MS Office and OpenOffice, to assist migration is compiled
- instructors are trained to assist with migration
- curricula at tertiary and secondary schools include FOSS
- CS and IS curricula at USP ensure adequate treatment of FOSS
- official policy particularly at educational institutions encourages use of open standards in file exchange (e.g. PDF, HTML, RTF, XML, CSV) as opposed to proprietary formats (e.g. .doc, .xls)
- cheap computers are provided to PICs primary and secondary schools installed with relevant light-weight FOSS systems and applications
- teacher training institutes, PIC Ministries of Education, and teaching associations provide training to teachers and curriculum developers on FOSS
- the USP BEd program in Computer Studies and other teaching qualification programmes include FOSS education.

2 INTRODUCTION

Software is one of the most important media for the expression of knowledge in our time. One of its distinguishing features is that it animates our knowledge in a particular domain. Considering its importance, it comes as no surprise that different forces within society struggle over who should control software, the knowledge expressed in it and last but not least its users.

One force that has matured over the last decade mandates the principles of transparency, open debate, finding consensus, etc. While it has been known under a variety of names in the past, it is currently termed “free and open source software”, or “FOSS”. With FOSS, control over the software and the knowledge expressed therein rests with the users.

Recently, (particularly from the last five years) there are many success stories involving the application of FOSS. A look around in the Pacific island countries, however, suggests that FOSS is not well known here. Starting from this initial impression, this research attempts to make FOSS used beneficially in the region. In order to achieve this, we investigate its current status. From there we devise initial recommendations to increase its benefit for the region.

The report is structured as follows: Section 2 is this introduction. Section 3 introduces fundamental concepts like “source code” and “free/open source software”. In Section 4 we motivate this study, present our goals, and formulate the research questions and objectives. Section 5 presents experience gathered in different regions, countries, governments, and private sector organizations, etc., followed by a summary of benefits and requirements for the use of FOSS in Section 6. Then, in Section 7 we outline the tools we have utilized, the choice of sampling and the limitations of our approach. The analysis and the results of the interviews are presented in Section 8. Section 9 presents case studies of organizations and projects we encountered while conducting the interviews. In section 10 we recommend initial action based on our data. Section 11 concludes and summarizes our report and points towards future work.

3 FUNDAMENTALS

3.1 Source Code

The software users run on their computers typically comes as *machine code*. Machine code consists of instructions the processor (or CPU) in the computer can execute directly. The advantage of using machine code is that the individual instructions can be executed very fast, i.e. machine code is a representation of the program’s operations adequate for execution by the hardware of the computer. It is, however, not at all adequate for programmers to write or modify the program. For this task a much more abstract representation is used: the source code. Whenever a programmer wants to create an executable representation of his/her program he/she has to translate the source code to machine code. The translation itself is achieved by a piece of software called *compiler*.

The fundamental concepts are:

- source code and machine code are two different forms of representing a program
- machine code is adequate for execution of the program, but inadequate for writing or modifying programs
- source code is adequate for writing and modifying a program, but is typically considered inadequate for execution of the program
- the compiler is a program that translates source code to machine code

3.2 What is free and open source software?

Software can be classified as either proprietary software or free and open source software [Perens, 1998]. The basis for this distinction is the rights to which the user of the software is entitled. Proprietary software typically denies rights that the user has with free and open source software, the most prominent being the right to look into (and thus learn about) the internal mechanisms of the software and others being the right to change the way in which the software operates, the right to let others see or use the software, etc. Companies producing proprietary software sell users very limited rights in an effort to maintain control over the software. Some examples of these are Microsoft Windows 2000/XP, Macromedia Dreamweaver, Adobe Photoshop, etc.

Free and open source software on the other hand is free in terms of user's rights, but not necessarily free in terms of cost. The user has the right to look into the source code and learn how the internals of the software work. In response to emerging circumstances and needs it can be adjusted. It can be passed on to others in the hope that it may serve their needs. While there might be costs involved in the use of free and open source software, under the usual free and open source software licenses these costs are not for acquiring the source code, but may be related to the configuration, the customization or other services necessary to meet the client's requirements. A somewhat polemic statement often heard in this context is: "Free and open source software is not *free* as in *free beer*, but *free* as in *freedom*."

The rights granted for free and open source software are typically laid out in an accompanying license, but that license will not demand any fees or payments for the basic rights discussed above. A great number of licenses have appeared all claiming to be open source licenses. This has prompted the open source community to identify guidelines for judging whether a license should be considered free and open source software [Perens, 1998].

The fundamental differences between FOSS and proprietary software give rise to many phenomena about FOSS that have recently been studied and reported. With its source code available for everyone interested, a culture of peer review and criticism (not unlike that known from academia) has evolved around FOSS. Participation is encouraged based on the common goal of improving the software. Contributions receive high esteem and contributors take pride in their contribution. As a result FOSS generally tends to run much more reliably than proprietary software, has fewer defects and in general is more secure. The release schedule of FOSS projects is typically guided only by technical considerations and not guided by marketing or other non-technical interests. Thus contributors can decide purely on the basis of technical merit whether to include some new feature or not. It is important to note that FOSS is an enabling trend. There are no hindrances to participation and contribution. Hence the traditional

categorization into user and developer is, if at all, much less significant than it is for proprietary software. A more appropriate categorization for FOSS would be the level of expertise and the degree of participation by a user/developer. Usage, in particular in combination with giving feedback, is one form of participating in FOSS. Activities like asking for additional features, reporting software defects, supporting other users by sharing hints, configuration advice, etc. are all not traditionally considered development activities, but are contributions just as important as actually writing the code. It is only a sequence of small steps, for example from observing a defect, to reporting it, to looking into the source code, asking "Why?", to fixing the defect, and then to contributing it to the particular project. Every participant is free to choose a level or form of participating that suits his/her current situation. Given enough time and skilled employees an organization can verify that the open source software it uses does exactly what the organization wants it to do. While most organizations will not want to invest this kind of effort, if the software is found defective in a specific aspect and that aspect is of sufficient importance to the organization, the organization can, for example order an employee to correct the defect.

Some examples of FOSS are Linux (the operating system named after Linus Torvalds, who started developing the system in 1991 as a student of Helsinki University), Apache (web server), Mozilla (Internet browser), MySQL (database suite), Open Office (office software) and many more. In fact, free software powers most of the Internet today.

FOSS has shown a lot of potential in developing countries, because it has the advantage of keeping the resources within the community and contributing to their socio-economic development and empowerment, compared to proprietary software, which is largely driven by an interest to control and typically presents a resource drain towards industrialized countries. Furthermore, FOSS allows the utilization of local talents and resources instead of outside expertise, which tends to be more expensive and sometimes inappropriate for the local needs.

Because of the low cost in obtaining FOSS, the savings made can be invested towards customization of the software to some specific, localized use. Hence investment goes directly into the creation of new software modified by locals. Typically, this local labour is much less expensive than having the software customized in an industrialized country would be, if that option exists at all.

It is for these reasons that one may assume that FOSS has a lot of advantages in Pacific communities and thus that there is a need to encourage and popularize its use. The central questions we ask are: "How can we benefit from free and open source software?" or "What do we need to do to derive benefit from FOSS?"

4 MOTIVATION, RESEARCH QUESTIONS AND OBJECTIVES

4.1 Motivation

We want the region to benefit from the use of FOSS.

Experience reported from numerous projects and international institutions suggests that free and open source software has particular features that are inductive not only in cost reduction, but also in supporting sustainable development of software and capacity building.

Our hypothesis is that the benefits of FOSS can be brought to bear in the Pacific island countries to a much greater extent than they currently are. In order to achieve this, strategic information is needed for the different stakeholders to plan effective action. Our survey provides such information, enabling the various stakeholders to direct their activities for optimal effect.

In this study we gather information on the extent of knowledge, awareness and usage of FOSS in the Pacific island countries. We will then disseminate this information to the stakeholders in the region, specifically to ICT policy makers, educational institutions, ICT system managers/analysts and current and potential users.

4.2 Questions and Objectives

The research question is:

1. What are the obstacles to achieving these benefits? or
2. What are the issues that need to be addressed before our region can maximize benefit from a widespread use of FOSS?

Any substantial answer to these questions will need strategic information. Our objectives are therefore:

1. Collect information on knowledge and awareness of FOSS. There is a whole range of knowledge categories, which need to be comprehensively evaluated in the survey. Sometimes people may be using FOSS without realizing it. Apart from knowledge, there is also the question of people's awareness of the significance, benefits etc. of FOSS. Therefore, the survey will address:

   (a) Are people in the region aware of FOSS?
   Measure: Interviewees stated whether they had heard of FOSS before or not.

   (b) Do they understand the principles of FOSS, of proprietary software, and of the FOSS licenses?
   Measure: We provided 5 simple statements relating to the basic FOSS principles on our questionnaires (question 18 on the organizational questionnaire and question 14 on the individual questionnaire). As a measure of awareness of the basic FOSS principles, we chose to use the conjunction of all 5 of these questions, i.e. we call an interviewee "aware of the basic FOSS principles", if she or he answered "True" to all of these 5 questions. Another possibility would have been to use a (weighted) sum of correctly answered questions to obtain degrees of awareness. We chose our measure due to the very obvious answers to those 5 questions.

   (c) Are they able to apply their knowledge to classify popular packages as either FOSS or proprietary software?

   (d) What are the sources of knowledge?

   (e) What is the quality of the sources?
   Measure: We related the source of interviewees' knowledge to their awareness of the basic FOSS principles.

   (f) What are the reasons for lack of knowledge?

2. Collect thorough information on the current usage of FOSS in the region.

   (a) What is the extent of FOSS usage?
   Measure: The number of interviewees who indicate that they are currently using FOSS.

   (b) Who uses it?
   Measure: We use the answers to question 36 on the organizational questionnaire, where interviewees indicated the groups within their organization who use FOSS.

   (c) How and for what purpose is it used?
   Measure: We use the answers to question 34 on the organizational questionnaire, where interviewees indicated the areas within their organization in which FOSS is used.

   (d) Why do they use or not use it?
   Measure: The criteria given by the interviewees in question 35 on the organizational questionnaire.

We present results with respect to these objectives in this report.

5 LITERATURE REVIEW

In this section we review different aspects of FOSS:

- FOSS as a technology phenomenon. The general phases observed with development of any technology and the phases specific to FOSS. We observe a general, long-term tendency towards FOSS solutions.
- Government requirements and FOSS. We discuss the requirements that are specific to governments in handling information and see how FOSS can help governments meet these requirements.
- Deployments and initiatives. We report on a variety of deployments that shed light on the use of FOSS around the world and mention different initiatives that may serve as guides in developing adequate initiatives for the region.
- Roles of government. Here we categorize the different roles government can have in the promotion of FOSS usage.

5.1 FOSS as a Technology Phenomenon

In the development of technology we can identify distinct stages [James, 2004]. These are:

Invention The initial idea is presented, typically together with a proof-of-concept implementation.

Expansion and Innovation The technology attracts investment, is conceptually expanded and subject to fast innovation.

Consolidation The number of companies active in the technology drastically reduces, either through fusions or through competition.

Maturity The technology is very well understood, there is no substantial innovation.

For information-based industries not requiring substantial amounts of resources for the manufacture of the product we can identify two more stages:

FOSS Domination FOSS implementations of the mature technology gradually catch up until they are on par with or better than proprietary implementations.

FOSS Era Proprietary implementations are pushed into niche markets, but the mainstream uses FOSS implementations.

These last two stages are not present in technologies requiring substantial amounts of resources for the manufacture of the product. For example, TVs, cars and mobile phones all require resources for every individual copy. Copying a program requires hardly any resources. This is the reason we will not observe the last two stages with so-called “brick-and-mortar” industries, whereas with information-based industries they are very likely.

Judging a technology according to the stage to which it has evolved gives users and prospective service providers additional indicators for procurement or business decisions.

Here are some examples of technologies that have evolved past the mature stage and where the FOSS implementation is at least on par with the proprietary implementation (cf. Table 1).

Technology	Proprietary	FOSS
web browser	MS Internet Explorer	Firefox
mail transport	MS Exchange	Sendmail, Postfix
web server	MS IIS	Apache
productivity suite	MS Office	OpenOffice.org, KOffice
image manipulation	Photoshop	Gimp
database	MS SQL	MySQL, PostgreSQL

Table 1: Technologies with sophisticated FOSS implementations

5.2 Policies and Initiatives around the World

Democratic governments around the world increasingly are realizing that with respect to management and processing of information they are in a position quite different from private sector companies.
Some of these differences are [Nuñez and Ackerman, 2002]:

1. The government’s clients are all the natural and legal persons of the country.
2. The information is public, i.e. these persons at the same time are the owners of the information kept and processed by government.
3. Government must therefore guarantee free (open, non-discriminatory) access to this public information.

4. It must guarantee permanence of public data.
5. It must guard against misuse of the data in a way that might undermine national security as well as the security of its citizens.

The characteristics of FOSS make it much easier for government to meet these requirements:

1. FOSS uses (and where it does not, can easily be modified to use) open, standard data formats. This allows free access to information.
2. Using and maintaining FOSS does not depend on the cooperativeness of a single provider. Due to the open source code, availability of compatible systems can be guaranteed. Many providers can compete and public data can be permanent.
3. The possibility of auditing the source code and thus guaranteeing it is free from code that maliciously or inadvertently compromises data security and integrity is necessary for the national security and autonomy of a country as well as for the security of its citizens.

5.2.1 Countries and Regions

We provide an overview of the many initiatives and visible projects that are being pursued around the world. This illustrates the many ways in which people from very diverse backgrounds and in very diverse environments have participated and benefited from FOSS.

In recognition of its innovative features, a number of countries have embarked on large scale projects to institute and encourage use of FOSS.

Africa, in 2003, saw the formation of the FOSSFA, the Free and Open Source Software Foundation of Africa. Backed by people from all over Africa its goal is promoting the use of FOSS in Africa. The South African government has recently [Yarney, 2003, Government Information Officers' Council, 2003] approved a FOSS strategy allowing for the use of both proprietary software and FOSS, but based on software appropriateness. FOSS is to be used in situations where there is doubt about the reliability of proprietary software. A requirement by the government is that all software is to adhere to open standards. The use of FOSS is to be supported by partnerships and public projects must use FOSS licenses wherever possible. The South African government strategy provides for measuring the "value" realized by using open source as a way of gauging success or failure.

The European Union has a thematic portal on "Information Society" listing numerous FOSS related projects receiving EU funding [European Union, nd] and in the UK there is now, as a result of poor service by vendors, an emphasis on open standards [Office of Government Commerce, 2004].

In Spain 80,000 computers running FOSS [IDABC - OSO, 2003] have been deployed in schools. In Germany a major FOSS project is overseeing the conversion of 13,000 desktop computers and servers to be used in the administration of the City of Munich [Anonymous, 2004]. The declared goal is to create jobs within the IT industry.

One of the most ambitious projects is in France, where one million computers in official use are being converted to FOSS [ATICA, 2002]. The French recently completed a test in which 20,000 PCs in the French Police and some ministries were converted to FOSS. By doing this, France hopes to halve its software spending.

In the US government agencies we also find an increasing number of FOSS uses. To name just two very visible projects: the US Census Bureau set up “QuickFacts” built on Linux, Apache, MySQL and Perl and the National Security Administration has produced SELinux [Loscocco and Smalley, 2001], a version of Linux specifically targeted at security-critical applications.

While to our knowledge not having a common organization, the Latin American countries have nonetheless enthusiastically embraced FOSS [Brod, 2003].

Mexico is the country of origin for the GNOME project. This project is about improving usability of desktop software to make it appealing to a very wide non-technical audience. One of the project founders, Miguel de Icaza, is the founder of what is now Ximian, a successful company centered on FOSS support and services.

In Argentina a bill was proposed in 2001 on a “Policy for Free Software Use for the Federal State”. It would have required government to use FOSS, but before it was passed, economic instability defeated the government. Similar legislation was resubmitted in 2004, but at time of writing had not been passed. Argentina is also the home of UTUTO - GNU/Linux Simple, a Live-CD of the Linux operating system targeting Argentinian users.

Brazil plans to migrate 80% of all computers in state and state-owned institutions to FOSS. Some provincial governments in Brazil considered legislation making the use of FOSS in government mandatory. At least the provinces Rio Grande do Sul and Pernambuco have laws promoting the use of FOSS in government. In Rio Grande do Sul government entities as well as (non-government) utilities have to use FOSS. This province is also the host of the International Free Software Forum, which will be held for the 6th time in 2005 and in previous years was the largest ICT showcase in Latin America and one of the largest FOSS events in the world (around 5000 attendants and 400 talks/sessions). The cities Amparo, Solonopole, Ribeirao Pires and Recife have approved legislation requiring the use of FOSS as long as there is no overriding technical reason to use proprietary software. Furthermore, Brazil’s health care system planned in 2003 to release 10 million lines of code under FOSS licenses.

Peru made headlines when Bill 1609 “The Use of Free Software in Public Administration” was proposed. It would require all government systems to operate on FOSS. The subsequent open debate between the proposer (Congressman Villanueva) [Nuñez, 2002] and Microsoft Peru [Gonzàlez, 2002] was widely reported in the media. The bill has not been voted on and is currently dormant.

The Cuban Ministry of Public Health implemented INFOMED based on GNU/Linux as early as 1992. INFOMED was the world’s first public health network with nationwide coverage.

Many more successes from South American coutries like Colombia, Venezuela, Uruguay, Chile, Bolivia, Costa Rica, Ecuador, Panama, Nicaragua, and the Dominican Republic are reported in [Brod, 2003]. Important FOSS originating in these countries include the web portal software PHP-Nuke and the web browser Dillo.

Many Asian countries have ongoing efforts relating to FOSS.

The most “catchy” project in China is the Red Flag Linux, a Linux distribution localized for China, co-founded by the Software Research Institute at the Chinese Academy of Sciences and the state-owned Shanghai New Venture Capital [Red Flag, 2000]. There is a very active Free Software Foundation (FSF) China. The Beijing Software Industry Productivity Center pursues a project to improve performance of localized GNU/Linux distributions. “Big players” in the area of FOSS like IBM, Red Hat and

Turbo Linux are present on the Chinese market.

In India a private-sector company, Encore Software, together with the Indian Institute of Science, developed a very low cost computer, the Simputer, based on GNU/Linux suitable for rural areas and for use by illiterate people. The device is designed to be shared in a village. It employs smart cards for personalization. Two Indian companies, Encore and PicoPeta, are now manufacturing and selling this device for around US$200.

Government entities support the development of a Hindi-localized GNU/Linux distribution, Indix. Furthermore, use of localized software in general is promoted.

For academic and research institutions GNU/Linux is supposed to be the de-facto standard and national and provincial governments are encouraged to use GNU/Linux-based installations.

Among the numerous activities in India are: conferences like the 2005 “Conference on Freedom in Computing, Development and Culture”, “Linux Bangalore”, active FOSS user groups in the major cities and major FOSS packages like OpenOffice already localized.

To encourage popular use of FOSS the Ministry of Information in Thailand started selling PCs with Linux pre-installed for around F$500 in 2003 [Orlowski, 2003].

The Malaysian Institute of Electronic Systems promotes the use of FOSS in government and the sale of an inexpensive computer built around the GNU/Linux operating system, the Komputer Nasional 2020, was launched by the prime minister in 2002. Malaysia is currently the Asian country with the fastest growing adoption of FOSS, attracting major investments by companies such as IBM, HP and Red Hat. There is a FOSS special interest group within the Malaysian National Computer Confederation and government is committed to using FOSS in some important entities.

The Pakistani government set up a task force to help the country adopt FOSS. Its objectives include training, localization and development of localized software.

Vietnam has included FOSS in its national program on information technology after a convention involving a delegation of government officials resolved that the country would save hundreds of millions of dollars per year while improving information security by switching to FOSS.

The Advanced Science and Technology Institute of the Philippines is developing a GNU/Linux distribution, Bayanihan Linux, specifically adapted to local requirements. It includes the usual productivity tools (office suite, Internet and networking software, image and multimedia applications).

The South Korean central procurement office of the government has contracted 120,000 workstations in government to be equipped with HancomLinux, a GNU/Linux distribution including HancomOffice, a South Korean office suite.

Developing countries that have moved towards FOSS have realized its advantages and potential. Their experiences should provide some indicators in relation to potential benefits to the Pacific island countries.

5.2.2 Pacific Island Countries

Review of similar activities in the Pacific island countries found an active Linux user group in the Solomon Islands. The SILUG (Solomon Islands Linux User Group) conducts irregular meetings, at which potential and current Linux users gather and for

example assist in the installation of this operating system. Similarly, the PLUG (Pacific Linux and Unix User Group) mailing list relates to the FOSS operating systems and applications available on them.

The Kiribati DNS registry (for the .ki top-level domain) is using Linux, Apache and PostgreSQL. SOPAC is actively contributing to the development of TikiWiki with its map server project TikiMaps. The USP School of Law Course Management System offers all of the more than 40 courses of the LLB undergraduate curriculum online (cf. Section 9.1.1).

5.3 Large Corporations

The size of FOSS migrations in public offices and administrations that can be quoted in terms of the number of PCs involved exceeded the size of similar migrations in the corporate world until recently. There are some substantial projects to report from the private sector.

CIO Magazine reports on successful migration projects [Koch, 2003]. These projects range from a toy retailer, KB Toys, deploying 10,000 FOSS-operated cash registers to 1,300 toy stores; a hotel franchise, Cendant, migrating 6,600 reservation clients to FOSS; to a car manufacturer, DaimlerChrysler, replacing its supercomputers for crash simulations with a cluster of FOSS-operated PCs.

ICBC, China's biggest bank, just recently announced its plan for the largest Linux deployment in China to date, which will migrate the servers in its network to Linux. This plan is remarkable due to its size: ICBC has total assets worth 5.3 trillion renminbi (US$640 billion), 100 million individual accounts, 8.1 million corporate accounts, 20,000 branches across China and employs 390,000 people.

5.4 Roles of Government

FOSSFA [Kimolo, 2003] points out that government take three approaches to their role in policy making with respect to FOSS:

1. Neutral
2. Enabling
3. Aggressive.

Neutral approach This approach ensures that alternatives are supported and that discrimination against FOSS is identified and removed. The government:

- adopts policies to ensure careful consideration of FOSS in IT procurement processes and implements evaluation criteria for FOSS products as well as procedures for adopting and maintaining open standards
- allows FOSS to compete adequately with proprietary software
- initiates activities to enhance awareness, knowledge and understanding of FOSS

Enabling approach This approach gears policies towards the creation of the capacity to implement and maintain the use of FOSS. In addition to the neutral approach the government:

- develops capacity to guide on the selection and implementation of FOSS
- actively promotes education and training on FOSS products
- supports establishing user-developer partnerships.

Aggressive approach This approach actively encourages the development of FOSS through legislation and policies. In addition to the enabling approach the government:

- actively supports FOSS developer communities and development projects
- adopts strategies to increase commitment to FOSS
- regularly audits the impacts of FOSS on government service delivery
- actively participates in programs minimizing the risks associated with FOSS
- standardizes on FOSS where analysis proves it superior.

5.5 Total Cost of Ownership

Although the purchasing price of the proprietary software may already seem high, it accounts for only a small portion of the total cost of ownership (TCO). Quoting a 1999 study by the Gartner Group, Microsoft in 2002 stated that only 8% of the total cost of ownership goes to the initial purchase of operating systems and applications; the remaining 92% go to installation, training, support, maintenance, administration, down-time, etc. If we assume that these numbers are applicable we can save at least these 8%. There are some additional savings opportunities (1-3 are from [Nuñez and Ackerman, 2002]):

1. For FOSS there is no barrier for potential service providers, extension developers, customization providers, etc. other than their own capacity to learn. For users this translates to availability of competing service providers to choose from on the basis of quality and cost.
2. Many organizations will want to have their improvements and bug fixes incorporated back into the FOSS project to save effort in future updates of that software and to take pride in the contribution. In this way one organization's maintenance has the potential to reduce the maintenance cost for other organizations.
3. FOSS, in general, has less down-time. It is typically not affected by malware such as viruses and worms and has higher stability. Obviously, shorter down-time means the cost for down-time is lower for FOSS than for proprietary software.
4. Labor cost in developing countries is typically substantially below that of industrialized countries. Therefore, the labor-intensive costs of installation, training, support, maintenance, administration and to some extent down-time are much lower (similar expertise provided) in developing countries than in industrialized countries. The purchasing cost of proprietary software, however, will usually be the same for industrialized as for developing countries.

The last point should not be underestimated. Assume a person in a developing country earns a quarter of what a similarly skilled person in an industrialized country earns. Further, assume that 90% of the cost after purchase is labor cost and the remaining 10% are as high as for the industrialized country. Then the services accounting for 82.8% of the TCO in the industrialized country can be obtained in the developing country for a quarter. The TCO in the developing country becomes 8% + 9.2% + 20.7% = 37.9% of the TCO in the industrialized country. Of this TCO, however, the initial purchase has a ratio of more than 21%. In this example, savings due to 2. and 3. above have not even been considered.

A related line of thought was presented in [Ghosh, 2003] comparing the price of one particular proprietary software package (Windows XP) in 176 countries' relative to the countries GDP per capita. Only some of the countries of our region are listed. Table 2 is an excerpt of the data concerning the region (the US are included for comparison).

Country	US$ GDP/cap.	WinXP cost in GDP/cap. months
United States	35277	0.19
Australia	19019	0.35
New Zealand	13101	0.51
Fiji Islands	2061	3.26
Kiribati	430	15.62
Marshall Islands	1830	3.67
Samoa	1465	4.59
Solomon Islands	614	10.94
Tonga	1406	4.78
Vanuatu	1058	6.35

Table 2: WinXP cost relative to GDP/cap.

In other words the price of the package is more than a year of GDP/capita in Kiribati, but only around 6 days of GDP/capita in the US. These numbers suggest that the ratio of the service costs in industrialized countries as opposed to developing countries might even be much higher than assumed for the example above. It is beyond the scope of this report to narrow this ratio down more precisely.

6 BENEFITS AND REQUIREMENTS OF FOSS USE

What are the benefits an individual, an organization, a country or a region will derive from using and participating in FOSS?

What are the requirements for individuals, organizations, countries or regions to use and participate in FOSS?

This section of our report provides concise answers to both questions, partly recapitulating information already mentioned in a different context in this report.

accessibility Most vendors sell computers with proprietary software pre-installed, making it very accessible. Only a few vendors offer a pre-installation of FOSS on request. Potential users need access through pre-installed FOSS, availability of FOSS on accessible media like CD, DVD, or low-cost Internet services.

adequate procurement policies Procurement policies must address the procurement of well defined services, not of for example brand-name products (see also [Australian Government Information Management Office, 2005]).

assistance Users require assistance in configuring, learning to use, troubleshooting, and in general employing software for their objectives. Many are reluctant to start using software unless they have the (subjective) feeling that they have this assistance.

auditing It is possible to audit the software and to verify that it is free from such problems as a specific security risk.

awareness Since there is no producer, there is no advertisement, no visits by sales representatives, no vendor commissioned studies etc. FOSS usage requires that users be made aware of its benefits and the existence of packages meeting their requirements.

capacity building FOSS has the tendency to improve capacity locally, i.e. within the organization, region, or country.

community There is a lively community interacting on the basis of cooperation around FOSS.

empower Anyone is empowered (legally by the FOSS license and technically by the availability of the source code) to use in any way and make any change to the software he/she, a client, or an employer might want.

enable learning Anyone can study the source code to learn how the software works internally and what its developers considered good programming practice. This knowledge can then be applied to improve the software at hand or to use related techniques on other software projects.

job creation A tendency of FOSS towards creating local IT-related jobs has been identified.

license cost Absence of licensing costs results in immediate savings.

meets government responsibilities Democratic governments have identified specific responsibilities in handling data that are much more easily met using FOSS (see also [Nuñez and Ackerman, 2002]).

modifiable to local needs No matter how small a locale, FOSS can and – as experience shows – will be localized to the needs of this particular locale.

reliability Guiding releases by technical merit results in FOSS typically being more reliable than proprietary software.

resources within community Whoever invests resources into software can much better direct where these resources go, for example whether they stay in the region or not, go to a smaller or larger provider of services, etc.

security In general FOSS takes a very conservative approach to security: features and services that might expose a system to security risks are initially disabled and features that enhance the security of a system are initially enabled.

vendor independence Anyone can obtain services from any provider, including source code changes according to specific requirements, such as security enhancements, fixes for defects, and particular functionality.

7 METHODOLOGY

A combination of quantitative and qualitative research techniques was utilized to obtain insight into the current situation of FOSS use in the region. For the quantitative method, which was our main method of data collection, a total of 467 structured interviews were completed from Fiji, Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. However, as Marshall and Solomon Islands data has not been received in time for analysis, only 387 completed interviews will be considered for this report. Since we intended to inform participants on the issues pertinent to FOSS in the process of conducting the interview to empower them on these issues, face-to-face interviews were always preferred. To a small extent email was utilized to communicate with the interviewees. This was to inform possible respondents about the research and to confirm their availability for interviews. In a few cases questionnaires were emailed to persons who were really interested to participate, but could not be available for face-to-face interviews.

The qualitative methods included two focus group interviews where key stakeholders as forerunners in the use of FOSS and persons who were keen to utilize FOSS were invited for focus group interviews in Suva and Vanuatu. These informal discussions were facilitated by the principal investigator to obtain more in depth information on how to promote FOSS use, how constraints could be overcome and possible future directions. Additionally, an organization was interviewed for presentation as a case study. This organization was already using FOSS and through the unstructured interview, the researchers attempted to find out why they were using FOSS, how it was initiated, what were the main factors of success, what problems were encountered during the implementation and maintenance and how these were addressed.

Because of the geographical size and diversity of the Pacific region, we decided to divide the fieldwork into two major approaches. Firstly, the team members with the assistance of field officers personally conducted the interviews in Fiji, Tonga, Samoa and Vanuatu (see Table 3). These countries have been identified as emerging leaders in the use of ICT compared to other Pacific island countries. In the second approach, the USPNet Operators and the USP Centre Directors in the Cook Islands, Kiribati, the Marshall Islands, Nauru, Niue, the Solomon Islands, Tokelau, and Tuvalu were requested to conduct the interviews in their countries (see Table 3).

The team members identified a tentative list of organizations and persons and forwarded it for the USPNet Operators' perusal for relevance. As some countries reported very few people in the country interested in filling the questionnaires, the sampling was revised to exclude countries that did not send any completed questionnaires.

Initially we estimated a sample of 745, but this was reduced to 620 in light of exclusion of non-participating countries. Five countries (see Table 3) did not complete any questionnaires. To substitute for this, more interviews were conducted in countries that had shown more than the anticipated interest in this study, such as Solomon Islands, Tuvalu and Vanuatu.

Based on these estimates and the actual number of completed interviews, we can calculate a response rate of 75.3% considering only those countries that participated in the study. This can be attributed to personal visits by the team members and field officers for the face-to-face interviews. The distribution of our sample is given in Table 3. Population estimates and Internet use estimates are as reported in [Internet World Statistics, 2005].

7.1 Design

Online research discovered related surveys in the United States, Europe, the United Kingdom and Japan. After assessing these questionnaires, questions were formulated and reviewed by research team members.

A few people in Suva and Lautoka were interviewed using an initial questionnaire. On the basis of the interviewee's suggestions and apparent difficulty in understanding certain questions, a revised questionnaire was printed for general use.

Two sets of questions were utilized as the main research tool for this study. The organizational questionnaire had a total of 53 questions and 83 variables, while the individual questionnaire had 40 questions and 49 variables to be tested. Refer to Appendix B for the questionnaires.

Initially it was planned to conduct interviews in all twelve USP member countries. However, in consideration of the time and funds needed, this was revised into two approaches as discussed in the section on methodology. As Table 3 shows we had initially included the Cook Islands, Kiribati, Nauru, Niue and Tokelau. These were later excluded because completed questionnaires were not returned from these countries. For these countries, we relied on the USPNet Operators and their colleagues to assist in the interview process and they reported that people were generally not interested in filling the questionnaires.

Marshall Islands, Solomon Islands and Tuvalu USP Centre teams showed a lot of enthusiasm and worked outside their normal hours to conduct some interviews. Marshall and Solomon Islands questionnaires were received very late and the data of these two countries will not be analyzed in this report.

For the selection of interviewees, our first target population was organizations using IT. A list of relevant organizations was identified in all selected countries, based on certain criteria as mentioned in the section on sampling. Individuals were selected arbitrarily; however, implicitly the selection would have been slanted towards persons involved in or having some interest in the IT field.

Two focus group interviews, in Port Vila (Vanuatu) and Suva (Fiji Islands), were conducted. The focus groups comprised IT Managers of various organizations, USP lecturers and CS students. The stakeholders for these focus groups were identified by the researchers taking into consideration the person's use and innovativeness in the IT section. The insights from these interviews were utilized in the report implicitly, rather than explicitly. These insights helped in defining more precisely the recommendations we give in Section 10. They also provided some initial clues for our analysis.

In all, 285 organizations were visited and with these, 225 organizational interviews were completed. Also we conducted and entered the data of 162 individual interviews.

7.2 Sampling

Pacific islands have diverse populations and Internet penetration rates (see Table 3). This is one of the reasons we decided not to use a function of population and Internet penetration as a standardized sampling strategy for this research. For instance, although Fiji has an Internet penetration rate of only 6.5% it has far more organizations involved in IT than Tuvalu, which has 13.3% Internet penetration rate.

ICT use and knowledge is highly concentrated among people involved in the IT sector, in (tertiary, and to a somewhat lesser extent in primary and secondary) education,

and private businesses who are continually attempting to increase profit and efficiency with the use of technologies. For this reason, our sample was biased towards such people, excluding sections of the population, such as subsistence farmers, whose lack of ICT, let alone FOSS, expertise made them less relevant to our research.

The target population for this research consisted largely of organizations having an established IT Department or known to be using ICTs on a regular basis. Baseline data such as organization details and contacts were obtained from the Forum Secretariat Trade Directory of the South Pacific Islands [South Pacific Forum Secretariat, 1998], the Internet, USP DFL Centres and various government departments in each of the countries. Information obtained identified organizations that had a separate IT department; such organizations, it was assumed, would have established use of IT and would therefore be highly relevant to our research. Within the organizations, it was considered relevant to interview staff who make decisions on purchasing, planning and managing the section. Developers and education providers, who are in position to initiate FOSS use among tertiary students, were also considered highly relevant.

For the individual questionnaires, persons were selected who were not particularly involved with any organization, but who were users or potential users of FOSS. Students, free-lancers, etc. were targeted by this questionnaire. These individuals mostly have higher education and work experience, but do not necessarily use or develop FOSS. In identifying the individuals, one of the criteria of selection was knowledge of using a personal computer. Individuals were selected arbitrarily, without any prior arrangement, due to lack of such organized information prior to the actual interview. However, in some instances the field interviewers snowballed into interviewing interested individuals. In some cases, the field interviewers, who were mostly from a computing science background, interviewed colleagues who were known FOSS users as well.

7.3 Limitations

One of the limitations of this research was the sampling. The sample could not be standardized for all selected countries. Therefore, although data is useful for the overall use within the technology sector, it might not be as relevant for cross-country comparison. For instance, Fiji has seven times the population of Tonga and five times that of Samoa, but the completed interviews for the former are only about twice as many as for the latter two countries. Additionally, in some countries, such as Fiji, the individual interviews produced a higher percentage of completed questionnaires while in other countries, such as Solomon Islands only 3 individual questionnaire were completed, so that country was excluded from analysis.

Ideally, individuals would have been selected randomly. Our selection has a bias towards individuals who had a computing science background or prior knowledge of this field and who use FOSS. Therefore, once again the individual data is not representative for the overall national population.

Within the questionnaire, there were some questions that were considered as sensitive and confidential, such as questions relating to budget. In cases where respondents were reluctant to answer this question, permission was obtained from the directors. However, in some cases, due to the unavailability of the directors, this question was left blank.

In Table 3 population estimates and Internet use estimates are as reported in [Internet World Statistics, 2005]. In “approach 1” the researchers or hired assistants

conducted the interviews, in “approach 2” we relied on volunteers to conduct the interviews.

Country	Population	Internet users	% of Internet penetration	Sample size	Approach	Completed interviews
Fiji Is.	851,820	55,000	6.5	300	1	159
Marshall Is.	54,313	1,400	2.6	40	1	30
Samoa	181,983	4,000	2.2	90	1	88
Solomon Is.	470,661	2,500	0.5	40	1	40
Tonga	103,058	2,900	2.8	80	1	77
Tuvalu	9,743	1,300	13.3	30	1	25
Vanuatu	213,364	7,500	3.5	40	1	48
Total	1,884,942	74,600		620		467
Countries initially considered for interviews, but in which no interviews were conducted						
Cook Is.	18,622	3,600	19.3	60	2	0
Kiribati	91,017	2,000	2.2	45	2	0
Nauru	11,218	300	2.7	10	2	0
Niue	1,743	-	-	5	2	0
Tokelau	1,413	-	-	5	2	0
Total	124,013	5,900		125		0

Table 3: Country sample distribution

7.4 Time Line, November 2004 – May 2005

Literature review	early Nov – late March
Revision of proposal	13 – 16 December
Submission of proposal	17 December
Response on proposal	22 December
Interview arrangements	23 – 31 December
Questionnaire finalization	23 – 31 December
Pilot interviews at USP	28 – 31 December
Interviews in Suva	4 – 10 January
Interviews in Nadi - Lautoka	11 – 14 January
Interviews in region	21 Feb – 25 March
Data input	25 March – 30 April
Data analysis	28 March – 8 April
Outline of report preparation	February 2005
Report finalized	May 2005

8 ANALYSIS AND RESULTS

8.1 General

Analysis is based on 225 interviews from an organizational background and 162 interviews from individuals not answering for a specific organization.

This section presents our sample according to a variety of classifications. We developed different questionnaires for respondents from an organizational background and individuals. We will keep the two sets separate in the following presentation. In order to avoid clutter when writing about the different groups, we will use the term “respondents” exclusively for interviewees from an organizational background; for individuals not answering for an organization we will use the term “individuals”. For percentages we follow the convention: “total” refers to the total number of respondents or individuals, 225 or 162, respectively. Thus numbers will not add up to 100% where there were interviewees who declined to answer the specific question.

8.1.1 Organizational background

There are interviews of 225 persons from an organizational background. Occasionally, numbers will not add up to the total 225, because some respondents declined to answer some questions.

In the following we will apply the standards used in Fiji for organization sizes. When referring to its number of employees a micro-organization has up to 5 employees, referring to its turnover it has up to F$30,000 in annual turnover. Similarly, small organizations have between 6 and 20 employees if classified according to their number of employees and they have an annual turnover between F$30,001 and F$100,000 if classified according to turnover; medium organizations have between 21 and 100 employees or an annual turnover between F$100,000 and F$500,000 if classified according to their number of employees or their turnover, respectively; and large organizations exceed 100 employees or an annual turnover of F$500,000.

With the researchers themselves located in Suva, Fiji Islands, we see a large number of respondents from that country (cf. Table 4).

	Fiji Islands	Samoa	Tonga	Tuvalu	Vanuatu	Total
Respondents	59	33	76	19	36	223
Total %	26.2	14.7	33.8	8.4	16.0	99.1

Table 4: Respondents by country

Only just under a third of our respondents are female (cf. Table 5).

	Female	Male	Total
Respondents	66	148	214
Total %	29.3	65.8	95.1

Table 5: Respondents by gender

The largest group with respect to the highest qualification they obtained is the group having a degree from an overseas institute (with respect to the location of the interview). Of our respondents 49 or 21.8% did not indicate to having had any tertiary education (cf. Table 6).

Only about a third of our respondents is 35 and above (cf. Table 7).

More than half of the respondents are from private sector organizations, with government and public sector organizations coming second at 30.5% of all respondents (cf. Table 8).

Highest qualification	Respondents	Total %
Certificate, overseas	5	2.2
Certificate, local	16	7.1
Diploma, online overseas	1	0.4
Diploma, overseas	17	7.6
Diploma, local	26	11.6
Degree, overseas	51	22.7
Degree, local	18	8.0
Masters, overseas	21	9.3
Masters, local	4	1.8
PhD, overseas	2	0.9
Others, overseas	5	2.2
Others, local	10	4.4

Table 6: Respondents' tertiary education

Age	Respondents	Total %
20–24	41	18.2
25–29	51	22.7
30–34	49	21.8
35–39	41	18.2
40+	29	12.9

Table 7: Respondents by age category

Sector	Respondents	Total %
Government and Public Sector	65	30.5
Private Sector	110	51.6
Civil Society	9	4.2
Regional Organization	16	7.5
Other	13	6.1

Table 8: Respondents by sector

Judging by the number of employees, almost two-thirds of our respondents are from small to medium organizations, but the micro and large organizations together still account for about one-third of our respondents (cf. Table 9).

Employees	Respondents	Total %
≤ 5	32	14.2
6–20	68	30.2
21–100	71	31.6
> 100	44	19.6

Table 9: Respondents by company number of employees

With respect to turnover the answers seem to be fairly evenly spread out, although the category of organizations having an annual turnover above $2 million is a little stronger than the others (cf. Table 10).

Turnover	Respondents	Total %
$\leq$ $30,000	35	15.6
$30,001–$100,000	28	12.4
$100,001–$500,000	39	17.3
$500,001–$2 million	22	9.8
$>$ $2 million	51	22.7

Table 10: Respondents by organization turnover

Many respondents stated that foreign earnings do not apply to their organization. Where foreign earnings do apply the answers are distributed fairly evenly among the categories, those earning below F$30,000 being the largest group (cf. Table 11).

Foreign earnings	Respondents	Total %
Not applicable	60	26.7
$\leq$$30,000	26	11.6
$30,001–$500,000	20	8.9
$500,001–$2 million	15	6.7
$>$ $2 million	20	8.9

Table 11: Respondents' organization foreign earnings

Table 12 relates respondents' highest qualification to their organization's number of employees. The size of some categories is too small to derive a trend reliably. However, it seems that with a higher qualification there is a trend towards larger organizations.

8.1.2 Individual background

Interviews of 162 individuals are available for analysis. Occasionally, numbers will not add up to the total 162, because some interviewees declined to answer some questions.

The individuals who decided to participate in our study are largely from the Fiji Islands, with the second largest group coming from Samoa (cf. Table 13).

There is a very high bias towards male individuals in our sample: the number of male individuals participating in our study is more than 3 times as high as that of female individuals (cf. Table 14).

Highest qualification	Respondents				% of category			
	≤ 5	6–20	21–100	> 100	≤ 5	6–20	21–100	> 100
Certificate, overseas	0	4	0	1	0.0	80.0	0.0	20.0
Certificate, local	5	4	2	3	31.2	25.0	12.5	18.8
Diploma, online overseas	1	0	0	0	100.0	0.0	0.0	0.0
Diploma, overseas	3	5	7	1	17.6	29.4	41.2	5.9
Diploma, local	3	10	11	2	11.5	38.5	42.3	7.7
Degree, overseas	4	19	17	10	7.8	37.3	33.3	19.6
Degree, local	0	5	7	6	0.0	27.8	38.9	33.3
Masters, overseas	0	2	9	10	0.0	9.5	42.9	47.6
Masters, local	1	0	2	1	25.0	0.0	50.0	25.0
PhD, overseas	0	0	1	1	0.0	0.0	50.0	50.0
Others, overseas	1	2	2	0	20.0	40.0	40.0	0.0
Others, local	4	2	1	2	40.0	20.0	10.0	20.0

Table 12: Respondents' tertiary education by company number of employees

	Fiji Islands	Samoa	Tuvalu	Sum
Respondents	96	52	6	154
Total %	59.3	32.1	3.7	95.1

Table 13: Individuals by country

More than half of participating individuals have at least a degree (cf. Table 15).

The individuals in our sample are rather young with 74% below 30 (cf. Table 16).

Only a small proportion of individuals are expatriates; the great majority are locals (cf. Table 17).

8.2 FOSS knowledge and awareness

8.2.1 Organizational background

Are people in the region aware of FOSS? In order to answer this question we use the answers to the question on the organizational questionnaire that asked whether respondents had heard of FOSS before (question 15).

Of the 225 respondents from organizations, 51.6% indicated that they had heard of FOSS before and 42.2% indicated they had not (cf. Table 18).

Only those respondents who had not heard of FOSS before were asked whether they wanted to know more about it. For those who had heard of FOSS before the interviewer was to skip the question. This accounts for the high number of "No answer" in Table 19. Apparently, many chose to answer this question even though they had heard of FOSS before. Several reasons are possible for this: it might be due to design flaws in the questionnaires, it might be due to insufficient training of the interviewers, it might

	Female	Male	Total
Respondents	35	111	146
Total %	21.6	68.5	90.1

Table 14: Individuals by gender

Highest qualification	Individuals	Total %
Certificate, overseas	4	2.5
Certificate, local	13	8.0
Diploma, online overseas	1	0.6
Diploma, overseas	12	7.4
Diploma, local	12	7.4
Degree, overseas	27	16.7
Degree, local	43	26.5
Masters, online overseas	1	0.6
Masters, overseas	8	4.9
Masters, local	2	1.2
PhD, overseas	7	4.3
Others, local	1	0.6
Others, overseas	2	1.2

Table 15: Individuals' tertiary education

Age	Individuals	Total %
20–24	84	51.9
25–29	36	22.2
30–34	16	9.9
35–39	7	4.3
40+	10	6.2

Table 16: Individuals by age category

be due to incompetence of the interviewers, and it might be due to the interviewee or the interviewer wanting to give or get an answer to the question, respectively. However, the questionnaire specifically told interviewers to skip the question and so did the written instructions accompanying the questionnaires. In their training, interviewers were instructed to skip the question for interviewees indicating they had heard of FOSS. This would leave the last three possibilities. It seems the latter two would be the more likely ones.

Of the 130 respondents who wanted to know more about FOSS, 105 gave reasons. The remaining 25 declined to give a reason. Many of the reasons given could be classified as "How can I integrate it into my business/work environment?", "What are its benefits?", "How can we use it to reduce cost?", and "I want to learn something new, stay informed, and/or improve my knowledge." We subjectively classified these reasons. If a reason matched more than one category it was counted in every category that it matched. The reasons mentioned most related to knowledge, interest, and learning (mentioned 33 times), next come reasons related to career advancement, the work place, and advancement of the organization (mentioned 19 times). Reasons involving cost reduction and financial aspects tied with the reason to benefit from FOSS (both mentioned 18 times). The fact that FOSS is a new concept was mentioned 10 times. In all, 24 reasons were left unclassified.

Origin	Individuals	Total %
Local	118	72.8
Expatriate	15	9.3

Table 17: Individuals by origin

Heard of FOSS	Respondents	% of total
Yes	116	51.6
No	95	42.2
No answer	14	6.2

Table 18: Respondents who had heard of FOSS

Want to know more	Respondents	% of total
Yes	130	57.8
No	35	15.6
No answer	60	26.7

Table 19: Respondents indicating they want to know more about FOSS

Ten reasons were given by the 35 respondents who did not want to know more about FOSS. These were:

- “Dont have the time”
- “Not interesting at all”
- “company has its own IT which develops its own software”
- “content with what we have at the moment”
- “ok with the concept”
- “we are not into software”
- “aire any part of open source”
- “becoz dont use much of ict”
- “never heard about FOSS”
- “not applicable right now”.

Among respondents, having heard of FOSS before does vary with the country of the organization. In the Fiji Islands 83.1% of respondents indicated that they had heard of FOSS before, whereas in Tonga that portion is only 30.3% (cf. Table 20).

	Respondents		% of country	
Country	Not heard	Heard	Not heard	Heard
Fiji Islands	9	49	15.3	83.1
Samoa	19	14	57.6	42.4
Tonga	45	23	59.2	30.3
Tuvalu	9	7	47.4	36.8
Vanuatu	13	22	36.1	61.1

Table 20: Respondents who had heard of FOSS by country

Apparently, awareness of FOSS is higher in larger organizations than in smaller organizations (cf. Tables 21, 22 and 23).

No. of employees	Respondents		% of organization size	
	Not heard	Heard	Not heard	Heard
≤ 5	16	12	50.0	37.5
6–20	32	32	47.1	47.1
21–100	28	42	39.4	59.2
> 100	15	26	34.1	59.1

Table 21: Respondents who had heard of FOSS by number of employees

Turnover	Respondents		% of category	
	Not heard	Heard	Not heard	Heard
$\leq$ \$30,000	27	7	77.1	20.0
\$30,001–\$100,000	17	10	60.7	35.7
\$100,001–\$500,000	16	21	41.0	53.8
\$500,001–\$2 million	10	11	45.5	50.0
$>$ \$2 million	13	36	25.5	70.6

Table 22: Respondents, who had heard of FOSS by turnover

Do they understand the principles of FOSS, of proprietary software, and of the FOSS licenses? If the respondents had encountered the concept before, have they received sufficient information to understand it?

We provided 5 simple statements relating to the basic FOSS principles on our questionnaires (question 18 on the organizational questionnaire). As a measure of awareness of the basic FOSS principles, we chose to use the conjunction of all 5 of these questions, i.e. we call an interviewee "aware of the basic FOSS principles", if she or he answered "True" to all of these 5 questions.

Of the ones who had heard it before, 56.0% (and 75.6% of the total) were not aware of at least one of the basic principles (free distribution, access to source code, modifiability of source code, redistribution of modifications, no unreasonable restrictions). This observation does not seem to vary very much by country (cf. Table 24).

The tables on awareness of basic FOSS principles present the respondents indicating that they had heard of FOSS before and giving a definite answer to the question about FOSS principles that indicates that they had not received sufficient information about these principles. In particular, the numbers in the tables do not include the 16 respondents who indicated they had heard about FOSS, but decided not to answer one of the questions on the principles. Of the respondents from Samoa who had heard about FOSS, 28.6% had not received sufficient information about its principles, whereas in Tuvalu 71.4% of these respondents did not recall the FOSS principles.

The level of unawareness seems to be similar for the sampled age categories that are sufficiently populated (cf. Table 25).

Foreign earnings	Respondents		% of category	
	Not heard	Heard	Not heard	Heard
$\leq$\$30,000	13	12	50.0	46.2
\$30,001–\$500,000	8	12	40.0	60.0
\$500,001–\$2 million	3	11	20.0	73.3
$>$ \$2 million	9	11	45.0	55.0

Table 23: Respondents, who had heard of FOSS by foreign earnings

Country	Respondents Heard, but unaware	% of country Heard, but unaware
Fiji Islands	20	40.8
Samoa	4	28.6
Tonga	7	30.4
Tuvalu	5	71.4
Vanuatu	13	59.1

Table 24: Awareness of FOSS basic principles by country

Age	Respondents Heard, but unaware	% of age group Heard, but unaware
20–24	9	47.4
25–29	19	57.6
30–34	9	32.1
35–39	7	41.2
40+	4	26.7

Table 25: Respondents having heard of FOSS, but unaware of basic principles by age

Respondents from larger organizations who had heard of FOSS before tend to have a better understanding of its principles (cf. Tables 26, 27 and 28).

No. of employees	Respondents Heard, but unaware	% of category Heard, but unaware
≤ 5	8	66.7
6–20	18	56.2
21–100	25	59.5
> 100	11	42.3

Table 26: FOSS basic principles by number of employees

However, here too we find a very high percentage of those who indicate they had heard about FOSS before, yet were unable to state some principles correctly. When talking to the respondents during interviews, the interviewers found many respondents to think that software they had not paid money for was FOSS. The numbers here seem to reflect this misconception.

Again, the statements about FOSS principles by those who had heard about FOSS before show a high level of unfamiliarity throughout the different sectors (cf. Table 29).

Is further information needed? As we have seen in Table 19 a large portion of the respondents answering our questionnaire want more information about FOSS. Furthermore, we may consider respondents who had heard about FOSS but could not recall the basic principles to be in need of information. Under this assumption at least 68.0% of all respondents require further information. The need for additional information does vary with the country, but it is high throughout, not dropping below 50.0% of respondents from any country.

The need for information is high for all organization sizes (cf. Tables 32, 33 and 34).

This number is lowest for organizations with a turnover of less than $30,000. It is interesting to contrast this with Table 22 where only 20% of this category had heard of

Turnover	Respondents Heard, but unaware	% of category Heard, but unaware
$\leq$ \$30,000	6	35.4
\$30,001–\$100,000	7	62.9
\$100,001–\$500,000	12	75.5
\$500,001–\$2 million	6	73.3
$>$ \$2 million	16	76.7

Table 27: FOSS basic principles by turnover

Foreign earnings	Respondents Heard, but unaware	% of category Heard, but unaware
$\leq$\$30,000	9	75.0
\$30,001–\$500,000	5	41.7
\$500,001–\$2 million	8	72.7
$>$ \$2 million	7	63.6

Table 28: FOSS basic principles by foreign earnings

FOSS before. This seems to indicate that there is little interest in knowing more about FOSS in small organizations.

Comparing the need for information by the organization's sector we can see that it is on a similar level for all the sectors except for regional organizations, where it drops below 40.0%, but is still substantial (cf. Table 35).

Only 16.4% of all respondents (or 29.3% of respondents who had heard of FOSS before) said they knew of the two most prominent FOSS licenses (GPL & BSD). However, we found only 12.5% of those who have heard of these licenses (or 1.8% of all the respondents) were aware of the basic license rights (freedom to change, freedom to distribute changes). Comparing the individual countries, we find a similar situation throughout.

Only 4 respondents fully understood the FOSS license principles. These came from medium to large organizations, in the private sector, civil society or regional organizations. No respondents from smaller organizations or from government and the public sector fully understood the FOSS license principles (cf. Tables 37, 38, and 39).

Assuming awareness of the FOSS licenses as a benchmark, almost the entire sample will require additional information.

Are they able to apply their knowledge to classify popular packages as either FOSS or proprietary software? Respondents were asked to classify some popular

Sector	Respondents Heard, but unaware	% of category Heard, but unaware
Government and Public Sector	12	44.4
Private Sector	28	45.2
Civil Society	3	50.0
Regional Organization	3	30.0
Other	2	25.0

Table 29: FOSS basic principles by organization sector

Locale	Respondents Heard, but unaware	% of category Heard, but unaware
Overseas	24	42.9
Local	15	45.5
No answer	10	37.0

Table 30: FOSS basic principles by locale of tertiary education

Country	Respondents Princ. known or no interest	Respondents Need information	% of country Princ. known or no interest	% of country Need information
Fiji Islands	3	49	5.1	83.1
Samoa	6	25	18.2	75.8
Tonga	22	38	28.9	50.0
Tuvalu	1	15	5.3	78.9
Vanuatu	1	26	2.8	72.2

Table 31: Need for information on FOSS principles by country

No. of employees	Respondents Princ. known or no interest	Respondents Need information	% of category Princ. known or no interest	% of category Need information
≤ 5	10	17	31.2	53.1
6–20	11	49	16.2	72.1
21–100	10	48	14.1	67.6
> 100	2	31	4.5	70.5

Table 32: Need for information on FOSS principles by number of employees

Turnover	Respondents Princ. known or no interest	Respondents Need information	% of category Princ. known or no interest	% of category Need information
$\leq$ \$30,000	15	17	42.9	48.6
\$30,001–\$100,000	2	22	7.1	78.6
\$100,001–\$500,000	5	31	12.8	79.5
\$500,001–\$2 million	4	13	18.2	59.1
$>$ \$2 million	4	37	7.8	72.5

Table 33: Need for information on FOSS principles by turnover

Foreign earnings	Respondents Princ. known or no interest	Respondents Need information	% of category Princ. known or no interest	% of category Need information
$\leq$\$30,000	7	12	35.0	60.0
\$30,001–\$500,000	3	15	16.7	83.3
\$500,001–\$2 million	3	9	21.4	64.3
$>$ \$2 million	5	14	25.0	70.0

Table 34: Need for information on FOSS principles by foreign earnings

Sector	Respondents		% of category	
	Princ. known or no interest	Need information	Princ. known or no interest	Need information
Government and Public Sector	5	48	7.7	73.8
Private Sector	21	76	19.1	69.1
Civil Society	0	7	0.0	77.8
Regional Organization	4	6	25.0	37.5
Other	2	9	15.4	69.2

Table 35: Need for information on FOSS principles by organisation sector

	Respondents aware	% of country aware
Fiji Islands	2	3.4
Samoa	1	3.0
Tonga	0	0.0
Tuvalu	0	0.0
Vanuatu	1	2.8

Table 36: Awareness of FOSS license principles by country

No. of employees	Respondents aware	% of category aware
≤ 5	0	0.0
6–20	2	2.9
21–100	2	2.8
> 100	0	0.0

Table 37: Awareness of FOSS license principles by number of employees

Turnover	Respondents aware	% of category aware
$\leq$ \$30,000	0	0.0
\$30,001–\$100,000	0	0.0
\$100,001–\$500,000	1	2.6
\$500,001–\$2 million	1	4.5
$>$ \$2 million	2	3.9

Table 38: Awareness of FOSS license principles by turnover

Foreign earnings	Respondents aware	% of category aware
$\leq$\$30,000	1	3.8
\$30,001–\$500,000	0	0.0
\$500,001–\$2 million	1	6.7
$>$ \$2 million	1	5.0

Table 39: Awareness of FOSS license principles by foreign earings

Sector	Respondents aware	% of category aware
Government and Public Sector	0	0.0
Private Sector	2	1.8
Civil Society	1	11.1
Regional Organization	1	6.2
Other	0	0.0

Table 40: Awareness of FOSS license principles by organisation sector

packages as either proprietary software or as FOSS and say whether they had used them and whether they are still using them (cf. Table 41). What is interesting about the answers here, is how many classified a FOSS package as proprietary and vice versa. The entries where this can be seen most clearly are Netscape, MySQL/PostgreSQL, Java, and Mozilla. It seems likely that there are different reasons for this for the individual packages: Netscape used to be proprietary software for years before it became open source, Java is a programming language and while respondents might have thought of Sun's JDK or JRE, it can be obtained at no cost through the Internet and thus might be mistaken for FOSS. MySQL/PostgreSQL were definitely confused with MS SQL in some cases. We conjecture that there are answers where they were confused but where we cannot know for sure. We have yet to identify plausible reasons for the many times Mozilla was classified as proprietary software.

What are the sources of knowledge? Respondents were asked their source for initially learning about FOSS (multiple answers were possible in Table 42).

Clearly, the Internet is the source most often mentioned, with almost twice as many respondents mentioning it as their source than the next sources (work colleagues, during studies).

Later, respondents were asked for their source for continuing information about FOSS (cf. Table 43). Again, the Internet is the source named most often, with almost three times as many as the next most frequent source (magazines) for keeping up-to-date on FOSS.

What is the quality of the sources? In order to gauge the quality of these sources we relate the sources to how well they allowed respondents to understand FOSS principles, licensing and which packages are FOSS and which are proprietary. Table 44 shows how many of our respondents mentioning each individual initial source were able to recall the FOSS basic principles.

Table 45 shows awareness of FOSS principles among the groups of respondents using a particular source to keep up-to-date on FOSS.

8.2.2 Individual background

Are people in the region aware of FOSS? In order to answer this question we use the answers to the question on the individuals' questionnaire that asked whether individuals had heard of FOSS before (question 11).

Of the 162 individuals, 59.3% indicated that they had heard of FOSS before and 34.6% indicated they had not (cf. Table 46).

Package	FOSS using	FOSS used	FOSS	Proprietary using	Proprietary used	Proprietary	No answer
Linux	31	15	58	9	2	7	93
Total %	14.4	7.0	27.0	4.2	0.9	3.3	43.3
Apache	25	8	58	1	1	14	104
Total %	11.8	3.8	27.5	0.5	0.5	6.6	49.3
OpenOffice	10	14	61	1	0	9	115
Total %	4.8	6.7	29.0	0.5	0.0	4.3	54.8
Mozilla	23	14	40	3	3	21	106
Total %	11.0	6.7	19.0	1.4	1.4	10.0	50.5
MS Office	5	4	4	99	4	24	82
Total %	2.3	1.8	1.8	44.6	1.8	10.8	36.9
Windows XP	6	5	1	98	9	23	83
Total %	2.7	2.2	0.4	43.6	4.0	10.2	36.9
Macintosh OS	1	5	3	16	7	74	111
Total %	0.5	2.3	1.4	7.4	3.2	34.1	51.2
MySQL/PostgreSQL	19	7	44	6	4	27	111
Total %	8.7	3.2	20.2	2.8	1.8	12.4	50.9
Java	9	8	13	14	8	56	108
Total %	4.2	3.7	6.0	6.5	3.7	25.9	50.0
Oracle	3	4	8	14	8	66	114
Total %	1.4	1.8	3.7	6.5	3.7	30.4	52.5
Windows Media Player	13	5	2	72	11	31	89
Total %	5.8	2.2	0.9	32.3	4.9	13.9	39.9
RealPlayer	11	8	9	45	12	38	97
Total %	5.0	3.6	4.1	20.5	5.5	17.3	44.1
Internet Explorer	10	6	1	85	9	30	83
Total %	4.5	2.7	0.4	37.9	4.0	13.4	37.1
Netscape	8	4	31	14	13	36	111
Total %	3.7	1.8	14.3	6.5	6.0	16.6	51.2

Table 41: Respondents' classification of packages

Source	Respondents	% of total
Academics	22	9.8
Work colleagues	42	18.7
Conference/workshop	25	11.1
Friends	35	15.6
FOSS community	20	8.9
Internet	80	35.6
Magazines/journals	30	13.3
Newspapers	12	5.3
Radio	3	1.3
During studies	41	18.2
Training	31	13.8
Television	8	3.6

Table 42: Source making respondent aware of FOSS

Source	Respondents	% of total
Academics	24	10.7
Work colleagues	36	16.0
Conference/workshop	30	13.3
Friends	39	17.3
FOSS community	23	10.2
Internet	117	52.0
Magazines/journals	42	18.7
Newspapers	16	7.1
Radio	2	0.9
During studies	24	10.7
Training	30	13.3
Television	7	3.1

Table 43: Source keeping respondents informed on FOSS

Source	Respondents aware	% of category aware
Academics	10	45.5
Work colleagues	18	42.9
FOSS community	13	65.0
Conference/workshop	10	40.0
Friends	13	37.1
Internet	36	45.0
Magazines/journals	19	63.3
Newspapers	7	58.3
Radio	0	0.0
During studies	23	56.1
Training	14	45.2
Television	6	75.0

Table 44: Awareness of FOSS principles by respondents' initial source

Source	Respondents aware	% of category aware
Academics	9	37.5
Work colleagues	11	30.6
FOSS community	11	47.8
Conference/workshop	10	33.3
Friends	11	28.2
Internet	40	34.2
Magazines/journals	19	45.2
Newspapers	5	31.2
Radio	1	50.0
During studies	9	37.5
Training	10	33.3
Television	4	57.1

Table 45: Awareness of FOSS principles by respondents' continuing source

Heard of FOSS	Individuals	% of total
Yes	96	59.3
No	56	34.6
No answer	10	6.2

Table 46: Individuals who had heard of FOSS

Our questionnaires asked only those individuals who had not heard of FOSS before whether they wanted to know more about it. For those who had heard of FOSS before the interviewer was to skip the question. This accounts for the high number of "No answer" in Table 47. Apparently, many chose to answer this question even though they had heard of FOSS before (refer to section 8.2.1 for possible reasons). Of all individuals, 69.1% indicated they want to know more about FOSS.

Want to know more	Individuals	% of total
Yes	112	69.1
No	12	7.4
No answer	38	23.5

Table 47: Individuals indicating they want to know more about FOSS

The 112 individuals who wanted to know more about FOSS gave 100 distinct reasons. Many could be classified as "I want to learn something new/stay informed on technology", "What are its benefits?", and "Can it help me with my career/at my work place?" The most frequently mentioned reasons related to learning and staying informed on technology (mentioned 58 times), next come reasons related to career advancement and the work place (mentioned 20 times). The reason to benefit from FOSS was mentioned 10 times. Financial reasons were mentioned 7 times. The 11 remaining reasons were left unclassified.

Seven reasons were given by the 12 individuals who did not want to know more about FOSS. These were:

- "enough skills and knowledge about foss"
- "i already know it"
- "i think i know enough"
- "its not my field"
- "not interested"
- "reasonably aware of foss"
- "aware of foss"

Here it is interesting to note that apart from the answers "its not my field" and "not interested", the remaining answers are very similar and could be considered equivalent. According to the interview instructions, these remaining individuals should not have been asked at all whether they want to learn more about FOSS or not.

For individuals having heard of FOSS before does vary with their country (cf. Table 48), with a remarkable 70.8% of individuals in the Fiji Islands having heard of FOSS before and 50.0% in Samoa.

Country	Individuals		% of country	
	Not heard	Heard	Not heard	Heard
Fiji Islands	24	68	25.0	70.8
Samoa	25	26	48.1	50.0
Tuvalu	3	1	50.0	16.7

Table 48: Individuals who had heard of FOSS by country

Do they understand the principles of FOSS, of proprietary software, and of FOSS licenses? If individuals had encountered the concept before, have they received sufficient information to understand it?

We provided 5 simple statements relating to the basic FOSS principles on our questionnaires (question 14 on the individual questionnaire). As a measure of awareness of the basic FOSS principles, we chose to use the conjunction of all 5 of these questions, i.e. we call an individual "aware of the basic FOSS principles" if she or he answered "True" to all of these 5 questions.

Of the ones who had heard of it before, 50.0% (and 56.2% of the total) were not aware of at least one of the basic principles (free distribution, access to source code, modifiability of source code, redistribution of modifications, no unreasonable restrictions). This observation does seem to vary by country (cf. Table 49). Table 49 indicates, for example that 47.1% of the individuals in the Fiji Islands who had heard of FOSS before and gave valid answers to the question about its principles were unaware of at least one of these principles.

Country	Individuals	% of country
	Heard, but unaware	Heard, but unaware
Fiji Islands	32	47.1
Samoa	15	57.7
Tuvalu	1	100.0

Table 49: Individuals' awareness of FOSS basic principles by country

The level of unawareness seems to be similar for those age categories that are sufficiently populated from our sample (cf. Table 50).

Age	Individuals	% of age group
	Heard, but unaware	Heard, but unaware
20–24	25	53.2
25–29	12	50.0
30–34	5	55.6
35–39	1	16.7
40+	3	42.9

Table 50: Individuals having heard of FOSS, but unaware of basic principles by age

Is further information needed? As we have seen in Table 47 a large portion of the individuals answering our questionnaire want more information about FOSS. Furthermore, we may consider individuals who had heard about FOSS but could not recall the basic principles to be in need of information. Under this assumption at least 85.8% of all individuals require further information. The need for additional information does vary

with the country, but it is high throughout, not dropping below four-fifths of individuals from a country (cf. Table 51). It should be noted that the percentages in Table 51 are relative to all individuals even those who did not give valid answers for question 14 ("What is your understanding of FOSS?") on the individual questionnaire. Considering only valid answers for question 14, the numbers would indicate an even stronger need for information.

	Individuals		% of country	
Country	Princ. known or no interest	Need information	Princ. known or no interest	Need information
Fiji Islands	8	77	8.3	80.2
Samoa	1	47	1.9	90.4
Tuvalu	0	6	0.0	100.0

Table 51: Individuals' need for information on FOSS principles by country

The need for information on FOSS principles is very high and is only somewhat less (but still high) for individuals having a master's degree or a doctorate (cf. Table 52).

	Individuals		% of category	
Qualification	Princ. known or no interest	Need information	Princ. known or no interest	Need information
Certificate, overseas	1	3	25.0	75.0
Certificate, local	0	12	0.0	92.3
Diploma, online overseas	0	1	0.0	100.0
Diploma, local	0	11	0.0	91.7
Diploma, overseas	0	12	0.0	100.0
Degree, overseas	1	21	3.7	77.8
Degree, local	0	35	0.0	81.4
Masters, online overseas	0	1	0.0	100.0
Masters, overseas	3	5	37.5	62.5
Masters, local	0	1	0.0	50.0
PhD, overseas	3	4	42.9	57.1
Others, local	0	1	0.0	100.0
Others, overseas	0	2	0.0	100.0

Table 52: Individuals' need for information on FOSS principles by tertiary education

Are they able to apply their knowledge to classify popular packages as either FOSS or proprietary software? Only 19.1% of all individuals claimed either to be highly involved with FOSS or to have decided to use it (cf. Table 53).

Stated awareness	Individuals	Total %
Highly involved with FOSS	7	4.3
Investigated and decided to use FOSS	24	14.8
Sought info, but need more before using	36	22.2
Slightly aware of FOSS concepts	75	46.3

Table 53: Individuals' stated awareness

As an indicator for the quality of this self assessment we use the question that asked the individuals to state whether a specific package is proprietary software or FOSS

(question 16 on the individuals' questionnaire). The 7 popular packages we asked for were: GNU/Linux, Apache, OpenOffice, Mozilla, MySQL, Windows Media Player and Internet Explorer. Only 29.0% of our interviewees were able to answer this question correctly.

Individuals were asked to classify these packages and say whether they had used them and whether they are still using them. As had been the case for respondents, it is interesting how many individuals classified a FOSS package as proprietary and vice versa. The entries where this can be seen most clearly are Mozilla, MySQL/PostgreSQL, Windows Media Player, and Internet Explorer. It seems likely that there are different reasons for this for the individual packages: MySQL/PostgreSQL were definitely confused with MS SQL in some cases. Windows Media Player and Internet Explorer may have been misclassified because they typically are installed on the PCs individuals buy. We have yet to identify plausible reasons for the many times Mozilla was classified as proprietary software.

	FOSS			Proprietary			
Package	using	used		using	used		No answer
Linux	25	22	50	6	0	4	55
Total %	15.4	13.6	30.9	3.7	0.0	2.5	34.0
Apache	25	15	53	2	1	6	60
Total %	15.4	9.3	32.7	1.2	0.6	3.7	37.0
OpenOffice	7	18	61	3	2	6	65
Total %	4.3	11.1	37.7	1.9	1.2	3.7	40.1
Mozilla	31	17	29	4	1	17	63
Total %	19.1	10.5	17.9	2.5	0.6	10.5	38.9
MySQL/PostgreSQL	20	12	37	5	1	23	64
Total %	12.3	7.4	22.8	3.1	0.6	14.2	39.5
Windows Media Player	6	12	2	82	5	10	45
Total %	3.7	7.4	1.2	50.6	3.1	6.2	27.8
Internet Explorer	3	13	1	79	7	15	44
Total %	1.9	8.0	0.6	48.8	4.3	9.3	27.2

Table 54: Individuals' classification of packages

8.2.3 Discussion

Using these figures as indicators, we can conclude a wide-spread lack of knowledge and awareness about FOSS. Since this results in a lack of options, we conclude a substantial need for disseminating information about FOSS in general and about FOSS licensing issues, in particular. This need is obvious no matter which benchmark we choose (for example wanting to learn more about FOSS, having heard about it but not recalling the principles, knowledge about FOSS licensing). The choice of benchmark seems only to influence how dramatic the result looks. Furthermore, from these observations it seems quite likely that the region is not benefiting from FOSS in the way it could.

We may assume that due to this lack of awareness of the characteristic features of FOSS as well as of proprietary software there are many scenarios in which the use of FOSS would be of great benefit, but where there is no knowledge that this option exists at all.

8.3 FOSS usage

In this section we give an impression on use of FOSS. Unfortunately, the general level of knowledge, awareness and understanding of the concepts is so limited that it distorts the answers. For instance, some respondents stated in the interviews that, according to their understanding, software they have not paid any money for is FOSS.

8.3.1 FOSS use in organizations

What is the extent of FOSS usage? Of all the organizations interviewed 91.1% stated they were using proprietary software and 1.3% stated that they were not currently using some proprietary software package. Contrast this with less than 27.1% stating that they are currently using FOSS.

At the same time, 6.2% of all respondents declined to answer whether they used proprietary software. Do some of them use it and maybe declined to answer because they have obtained it without paying for it? A few interviewees actually told us that this is the case. In Vanuatu the principal researcher was told that for one of the versions of Microsoft Windows all installations in Vanuatu had the same serial number, i.e. they were installed from a copy of (a copy of...) the same original software. This account was confirmed by several interviewees in Vanuatu, when we asked for their assessment. A number of people indicated that culturally there does not seem to be a strong concept of copyright in the region. We can therefore assume a wide-spread use of software that was illegally copied. It seems plausible also to assume that many of the respondents who declined to answer whether they used proprietary software do indeed use it (cf. Tables 55 and 56). For these tables respondents were asked which phrase best described their organizations' usage of proprietary software and which best described their usage of FOSS.

Proprietary	Respondents	% of total
Currently using	205	91.1
Planning to use within 3–5 years	1	0.4
Thinking of using in future but not decided yet	2	0.9
Not using and no plans for future use	0	0.0
Used before, but not using now	0	0.0
Don't know or no answer	17	7.6

Table 55: Current use of proprietary software

FOSS	Respondents	% of total
Currently using	61	27.1
Planning to use within 3–5 years	11	4.9
Thinking of using in future but not decided yet	45	20.0
Not using and no plans for future use	33	14.7
Used before, but not using now	2	0.9
Don't know or no answer	73	32.4

Table 56: Current use of FOSS

While the level of proprietary software use does not vary very much with the country of the respondent (cf. Table 57), the level of FOSS use does vary significantly, ranging from only 13.2% of respondents in Tonga to 44.1% of respondents in Fiji (cf. Table 58).

Country	Respondents use proprietary	% of country use proprietary
Fiji Islands	55	93.2
Samoa	32	97.0
Tonga	67	88.2
Tuvalu	15	78.9
Vanuatu	35	97.2

Table 57: Current use of proprietary software by country

Country	Respondents use FOSS	% of country use FOSS
Fiji Islands	26	44.1
Samoa	8	24.2
Tonga	10	13.2
Tuvalu	4	21.1
Vanuatu	13	36.1

Table 58: Current use of FOSS by country

In general, we note a higher percentage of FOSS users in larger organizations. This trend is apparent in Table 60, and, with a break for organizations having a large number of staff, also in Table 59.

No. of employees	Respondents use FOSS	% of category use FOSS
≤ 5	4	12.5
6–20	17	25.0
21–100	24	33.8
> 100	14	31.8

Table 59: Current use of FOSS by number of employees

Looking at organizational sectors we find government and the public sector to have the least use of FOSS at 23.1% and regional organizations to have the highest use of FOSS at 50.0% (cf. Table 62).

Some 32.4% of respondents either indicated not knowing whether they used FOSS or decided not to answer this question (cf. Table 56). It seems likely that some of these respondents are actually using FOSS in their organizations without being aware of it. Our questionnaire does have a question for specific software packages and whether according to the respondent's knowledge his organization uses these. Only 1.7% of respondents stated having used one of these packages that is FOSS and belonged to the above 32.4%.

It does not seem to make a difference for FOSS use where someone was educated (cf. Table 63).

The ratio of male FOSS users is almost 3 times as high as the ratio of female users (cf. Table 64). This is one aspect that will warrant further investigation: Why is the ratio of organizations using FOSS in which our respondents were female only a third of the same ratio where our respondents were male? This issue seems quite distinct from a similar ratio found with individuals: our respondents were speaking for their organizations, whereas individuals were speaking for themselves. We have not found

Turnover	Respondents use FOSS	% of category use FOSS
$\leq$ \$30,000	2	5.7
\$30,001–\$100,000	6	21.4
\$100,001–\$500,000	6	15.4
\$500,001–\$2 million	8	36.4
$>$ \$2 million	19	37.3

Table 60: Current use of FOSS by turnover

Foreign earnings	Respondents use FOSS	% of category use FOSS
$\leq$\$30,000	4	15.4
\$30,001–\$500,000	6	30.0
\$500,001–\$2 million	6	40.0
$>$ \$2 million	5	25.0

Table 61: Current use of FOSS by foreign earnings

a plausible explanation yet.

In addition to awareness information we can also see current and past usage of some popular software packages in Table 41. To make this information more accessible we have consolidated it in Table 66. The most popular FOSS packages are Linux, Mozilla, Apache and MySQL/PostgreSQL.

Some respondents might have used FOSS, but might not use it anymore. Of the organizational respondents only 2 answered they had used FOSS before, but were not currently using it. Only one of these two gave a reason and that reason was “only basic knowledge”.

Who within the organization uses FOSS? The strongest group of FOSS users within organizations is IT personnel (cf. Table 67).

Support for the FOSS usage comes mostly from in-house staff or from web sites (cf. Table 68).

Some 12.9% of all organizations claim to train their staff on FOSS.

How and for what purpose is it used? Respondents who used FOSS were given a list of potential areas and/or purposes and asked to indicate for each whether they use FOSS in that area or not (cf. Table 70).

Sector	Respondents use FOSS	% of category use FOSS
Government and Public Sector	15	23.1
Private Sector	30	27.3
Civil Society	3	33.3
Regional Organization	8	50.0
Other	4	30.8

Table 62: Current use of FOSS by sector

Locale	Respondents use FOSS	% of category use FOSS
Overseas	28	27.5
Local	21	28.4
No answer	12	24.5

Table 63: FOSS use by locale of tertiary education

Gender	Respondents use FOSS	% of category use FOSS
Female	8	12.1
Male	51	34.5

Table 64: FOSS use by gender

Age	Respondents use FOSS	% of age category use FOSS
20–24	10	24.4
25–29	16	31.4
30–34	17	34.7
35–39	11	26.8
40+	4	13.8

Table 65: FOSS use by age

	Respondents			% of total		
Package	using	used	not used	using	used	not used
Linux	40	17	65	18.6	7.9	30.2
Apache	26	9	72	12.3	4.3	34.1
OpenOffice	11	14	70	5.2	6.7	33.3
Mozilla	26	17	61	12.4	8.1	29.0
MS Office	104	8	28	46.8	3.6	12.6
Windows XP	104	14	24	46.2	6.2	10.7
Macintosh OS	17	12	77	7.8	5.5	35.5
MySQL/PostgreSQL	25	11	71	11.5	5.0	32.6
Java	23	16	69	10.6	7.4	31.9
Oracle	17	12	74	7.8	5.5	34.1
Windows Media Player	85	16	33	38.1	7.2	14.8
RealPlayer	56	20	47	25.5	9.1	21.4
Internet Explorer	95	15	31	42.4	6.7	13.8
Netscape	22	17	67	10.1	7.8	30.9

Table 66: Respondents' package use

FOSS used by group	Respondents	% of total
IT personnel	68	30.2
Students	19	8.4
Administrative staff	21	9.3
Clerical Staff	5	2.2
Others	7	3.1
None	11	4.9

Table 67: Groups within the organization using FOSS

FOSS support provider	Respondents	% of total
In house staff	45	20
Software company/paid supplier	14	6.2
FOSS newsgroup	16	7.1
Websites	32	14.2
Friends/relatives	12	5.3
Other	3	1.3
Don’t know	16	7.1
NR	23	10.2

Table 68: Support provider for FOSS

Organization trains FOSS	Respondents	% of total
Yes	29	12.9
No	73	32.4
Don’t know	8	3.6

Table 69: Organization training staff in use of FOSS

FOSS used in area	Respondents	% of total
Infrastructure (network,server,etc)	36	16
Administration	24	10.7
Finance	15	6.7
Teaching	18	8
Student Labs	13	5.8
Research	15	6.7
Production	7	3.1
Medical	1	0.4
Manufacturing	3	1.3
PC’s for client applications	16	7.1
Database	32	14.2
Creating websites	27	12
Banner system	4	1.8
Scheduling	3	1.3
Project Management	9	4
Inventory Management	12	5.3
Resource Planning	4	1.8
Training	14	6.2
Audio/Video production	5	2.2
Software development	19	8.4
Other	3	1.3
Don’t know	8	3.6
NR	8	3.6

Table 70: FOSS usage by area

The top 5 areas in Table 70 are:

1. Infrastructure
2. Database
3. Creating web sites
4. Administration
5. Software development.

We were surprised by the high ranking of “Administration”. A plausible explanation for this would be that some respondents confused “Administration” and “System administration”.

Why do they use or not use it? We asked respondents about the importance of some given criteria for their initial decision to use FOSS (question 35 on the organizational questionnaire). The average ranking for the individual criterion is presented in Table 71. The average is computed only over those respondents that actually gave a ranking for this criterion.

Criterion for using FOSS	Average importance
Open and/or modifiable source code	4.29
Low or no license fees	4.07
Better price to performance ratio	4.18
Higher performance	4.29
Higher stability	4.27
Better protection against unauthorized access	4.12
Better functionality	3.96
Higher number of potential applications	3.86
Open source applications were already integrated into the Open Source Server	4.01
Lower hardware costs for FOSS	4.41
Cost savings regarding installation, integration and customization to company needs	3.28
Cost savings regarding daily operations, administration and support	3.24
Cost savings regarding training and introduction of users	3.97
FOSS recommended as a better alternative by IT personnel, media, Internet, etc.	4.17
Existing solutions, know-how and/or experiences in your company regarding Open Source server operating systems	4.29
Better response with bug fixes and/or support	4.03
Less reliance on a particular vendor	4.1
Better inter-operability with other products due to open standards	3.74
FOSS used for internal purposes and Proprietary for external communications	3.18

Table 71: Average importance of criteria to use FOSS

The top 5 criteria are (2., 3. and 4. have identical rank):

1. Lower hardware costs for FOSS
2. Open and/or modifiable source code
3. Higher performance
4. Existing solutions, know-how and/or experiences in your company regarding Open Source server operating systems
5. Higher stability

The bottom 5 criteria are:

1. FOSS used for internal purposes and proprietary for external communications
2. Cost savings regarding daily operations, administration and support
3. Cost savings regarding installation, integration and customization to company needs
4. Better inter-operability with other products due to open standards
5. Higher number of potential applications

8.3.2 FOSS use by individuals

What is the extent of FOSS usage? Of the individuals 34.0% stated that they are currently using FOSS (cf. Table 72).

FOSS	Individuals	% of total
Currently using	55	34.0
Planning to use within 3–5 years	16	9.9
Thinking of using in future but not decided yet	38	23.5
Not using and no plans for future use	12	7.4
Used before, but not using now	8	4.9
Don't know or no answer	33	20.4

Table 72: Current use of FOSS by individuals

This number has to be viewed with some scepticism: for the two proprietary packages that individuals were asked to classify as FOSS or proprietary, almost 20% of answers given were incorrect. This may be attributed to the misunderstanding that software for which nothing was paid is "free" and thus must be FOSS.

Somewhat surprisingly, 20.4% of individuals indicated to either not know whether they used FOSS or decided not to answer this question (cf. Table 72). It is possible, but it does not seem as likely as for organizational use, that some of these are actually using FOSS without being aware of it. Our questionnaire does have a question for specific software packages and whether the individual uses these. Only 1.9% of individuals stated having used one of these packages that is FOSS and belonged to the above 20.4%.

The level of FOSS use by individuals does vary significantly by country, ranging from only 19.2% of individuals in Samoa to 45.8% of respondents in Fiji (cf. Table 73).

Country	Individuals use FOSS	% of country use FOSS
Fiji Islands	44	45.8
Samoa	10	19.2

Table 73: Individuals' current use of FOSS by country

It does not seem to make a difference for FOSS use where someone was educated (cf. Table 74).

Locale	Individuals use FOSS	% of category use FOSS
Overseas	24	40.0
Local	28	38.9
No answer	3	10.0

Table 74: Individuals' FOSS use by locale of tertiary education

The ratio of male FOSS users is more than twice as high as the ratio of female users (cf. Table 75). This may be due to a generally higher affinity for technology among men.

Gender	Individuals use FOSS	% of category use FOSS
Female	6	17.1
Male	45	40.5

Table 75: Individuals' FOSS use by gender

For those age categories where our sample is high enough, we see a fairly average percentage of FOSS users (cf. Table 76).

Eight individuals have used FOSS, but are not using it anymore. Three of these individuals did not give a reason for not using FOSS anymore. The reasons given by the other 5 are:

- "taking more time to familiarize on it"
- "used it as part of project in a 400 level unit"
- "not familiar with linux enviroment"
- "curriculum changed"
- "Computer is b/down".

Two of the above reasons have an apparent relation to studies, two indicate a lack of familiarity and one may be seen as a lack of resources (hardware, time for a reinstallation, ...).

In addition to awareness information we can also see current and past usage of some popular software packages in Table 54. To make this information more accessible we have collected it in Table 77.

Age	Individuals use FOSS	% of age category use FOSS
20–24	27	35.1
25–29	11	36.7
30–34	4	26.7
35–39	4	66.7
40+	7	77.8

Table 76: Individuals' FOSS use by age

Package	Individuals			% of total		
	using	used	not used	using	used	not used
Linux	31	22	54	19.1	13.6	33.3
Apache	27	16	59	16.7	9.9	36.4
OpenOffice	10	20	67	6.2	12.3	41.4
Mozilla	35	18	46	21.6	11.1	28.4
MySQL/PostgreSQL	25	13	60	15.4	8.0	37.0
Windows Media Player	88	17	12	54.3	10.5	7.4
Internet Explorer	82	20	16	50.6	12.3	9.9

Table 77: Individuals' package use

8.4 Summary

We summarize the above data and address our research objectives below.

8.4.1 Background

This analysis is based on 387 structured interviews (225 from organizations and 162 individuals) with varying backgrounds. Our interviewees are well-educated with 42.7% of respondents from organizations and 56.0% of individuals having at least a degree. Respondents with higher degrees seem to tend towards larger organizations. Interviewees are relatively young, with 31.1% of respondents from organizations and 10.5% of individuals above the age of 35. One-third of respondents come from small organizations, one-third from medium organizations, and another third from micro and large organizations combined. Respondents from the private sector make up for more than half of our respondents, and government and the public sector make up for almost a third.

8.4.2 Awareness

Although 51.6% of respondents and 59.3% of individuals say they have heard of FOSS before, we found that these numbers should be used with caution since many seemed to have misconceptions about FOSS. Whether interviewees claim to have heard of FOSS varies with the country. This proportion is least in Tonga at 30.3% and highest in the Fiji Islands at 83.1%. It also varies with the organization's size and respondents from larger organizations are more likely to be aware. There seems quite some interest to learn more about FOSS, with 57.8% of respondents and 69.1% of individuals wanting to know more. Again, this figure should be used with caution, since interviewers were not supposed to ask this question if the interviewees had heard of FOSS before.

Only 24.4% of respondents and 29.6% of individuals sufficiently understand the basic FOSS principles, i.e. only about half of the interviewees claimed to have heard about it before. Again, understanding varies with organization size and is better in larger organizations. When it comes to FOSS licensing principles not even 2% of our respondents have a sufficient understanding. When asked to classify popular software packages as FOSS or proprietary software we find a similar picture: interviewees confuse the fact that they have obtained software without payment with the fact that it is FOSS.

The most widely used source for information about FOSS is the Internet. However, the quality of interviewees' understanding is higher if interviewees have learned about it or keep up-to-date on it using magazines and journals, the FOSS community, or have receive information during their studies.

8.4.3 Usage

At least 91.1% of organizations currently use proprietary software, but only 27.1% of respondents and 34.0% of individuals use FOSS. Again, due to the confusion mentioned above, these numbers have to be used with caution. Only 0.9% of organizations and 4.9% of individuals had used FOSS before and were no longer using it. Reasons for this were lack of knowledge and familiarity and lack of resources. FOSS usage varies with the country, the organization's number of employees and the organization's sector. In Tonga 13.2% of organizations use FOSS compared to 45.8% of individuals in the Fiji Islands; 5.7% of organizations having a turnover of not more than F$30,000 use FOSS and 37.3% of organizations with a turnover above F$2 million; 23.1% of government and public sector organizations use FOSS and 50.0% of regional organizations. Within the organizations the strongest users are IT personnel (30.3%) and existing FOSS installations are likely to be supported by in-house staff (20.0%). The areas in which it is most strongly used are infrastructure, database, creating websites, and software development.

9 CASE STUDIES

We present three case studies coming from two completely different backgrounds and having entirely different goals. The first case study is presented here to give the reader an idea for the path that can be taken from not using a FOSS solution to having enough expertise to modify the source code of the software to the organizations needs. The second case study is presented as an example of ways to employ technology, that are enabled by the availability of FOSS and that would most likely not be possible without it. The third case study shows how a large corporation migrated to a FOSS solution and the experience they made in the progress.

9.1 Regional Organization

9.1.1 USP School of Law Course Management System

The Head of School of the School of Law, Bob Hughes, gives the following somewhat technical description of their course management system.

The School decided to come up with an online education delivery platform for the University of the South Pacific's School of Law in November 2001. The brief was to put something together using only open source software. Up until this point, the School had been publishing a limited range of supplementary materials in a couple of courses, using MS FrontPage and IIS. Some discussion forums were offered, but a lack of security resulted in too many inappropriate postings and they had to be taken offline. There was also a concern that the unprotected course materials may be poached by other institutions if not protected. Thus the initial requirements were fairly modest – a simple content management system which non-technical users would be comfortable with, discussion forums and an easy to administer user-level security system.

After much web crawling and test drives, Zope + CMF 1.1 was chosen. The range of add-on products looked promising. This was pre-Epoz & Kupu, but StructuredText promised a simple way for people to publish content without learning HTML. Local roles seemed a good way to manage course-level access. The separation of content, presentation and business logic also seemed like a good idea. Despite having never seen Zope or Python before, we were able to get a prototype up and running within a week. By February 2002, we had Version One, offering online courses in 2 subjects using a fairly standard CMFDefault site, with the following couple of non-CMF products hacked into the site as well:

- 'Squishdot' for discussion forums
- 'Exam' for online tests

Of course much of the success of the project from this point onwards was due to the strong commitment of the Law School staff to learning the new system and using it to its full potential. Comprehensive lecture notes and readings were made available on the site, online tests were written for each week's content area, and the discussion forums were regularly patrolled by teaching staff. This level of commitment made the eaSOL system into a dynamic learning environment which students were happy to use.

Incremental improvements took place over the next 12 months as we climbed the undeniably steep Zope learning curve, and new products were released. For example:

the Squishdot product was replaced by a version of CMFForum, hacked to remove Plone dependencies; when Epoz was released, it was integrated into the CMFDefault edit templates; presentation templates were overhauled in 2003 to give the site a distinctive look and feel; as CMFDefault developed, Page Templates came to replace DTML. Many site components had to be converted as a result; in order to integrate PloneChat into the site, a number of Plone tools were added to the site and PloneChat was hacked to work with CMFDefault's main_template.pt; some of the navigation elements, such as batch navigation, were imported from Plone to improve usability; the LTOnlineTest product began development in late 2003, in order to replace the non-CMF Exam product with a CMF-style product. This would remove any need for teaching staff to use the ZMI; the LTAssignmentBox product was developed to make the submission of assignments by online students more efficient.

At the same time, students who had used the system in some units were putting pressure on teaching staff to increase the number of courses

available in the system. By February 2003, about 15 courses had been earmarked to use eaSOL. A new online-student mode of enrolment had been pushed through with its own fee structure to support the new remote mode of study. Prior to this system being offered, students from around the South Pacific had to move to Vanuatu to complete their studies in face-to-face mode. By Semester 1, 2004, all 40+ courses of the undergraduate LLB program were offered in online mode.

By early 2004, it was apparent from the continued pace of improvement of Plone, and the eaSOL site's increasing reliance on Plone tools and code, that a migration to Plone was in order. The migration to Plone 2.0.4 was finally done in November 2004, involving over 250Mb of course content. The LTOnlineTest and LTAssignmentBox products were rewritten for Plone, and the hacked version of PloneChat was replaced with an unmodified PloneChat2.

In order to cater for increased demand, the site now runs on a 4-box ZEO cluster. The School of Pacific Languages, and the Early Education department have recently begun using the eaSOL system for their own courses.

Of course, the improvement process never ends. We are now considering replacing CMFForum with CMFBoard; adding PowerPoint-style presentations based on Andy Mackay's implementation of Eric Meyer's S5; more improvements for LTOnlineTest; a mail-in content product, similar to the Moblog feature of CoreBlog and more.

We have quoted the above text from Bob Hughes verbatim, because it is a very good example on how capacity is built. Starting with little knowledge about the application domain, some people in an organization get involved. This group builds up capacity and expertise, and if it invites other people from the organization to participate openly, can bring great benefit to the organization.

9.2 Private Sector

We present two very different case studies from the private sector. One is a self-funded grassroots project, the other is the – to our kowledge – the largest holding in the Fiji Islands.

9.2.1 Freswota Computer Resource Center

The following press release describes a self-funded project built around used computers and FOSS.

FOR IMMEDIATE RELEASE

GRASS ROOTS GOES HIGH TECH

A small community-based project promises to change the way we deal with technology in Vanuatu.

With the press of a key, the Honourable Arnold Prasad, Minister of Youth, Development and Training, started a new chapter in the lives of his constituents. On Friday, April 22, Prasad officially opened the Freswota Computer Resource Center (CRC), a unique experiment in grassroots technology in Vanuatu.

> The Freswota CRC is unique in Vanuatu, as it is designed to provide computing and Internet services directly to community members in a location close to their homes. Located outside of the commercial center of Port Vila, it is much more accessible than some other commercial services. Likewise its price levels are designed to be affordable to the average working class ni-Vanuatu.
>
> "The Freswota CRC is designed to be cooperative, not competitive," said FSP [Foundation for the Peoples of the South Pacific] IT consultant Dan McGarry. "We realise that there are a number of very capable training providers in Port Vila, such as VIT, USP and Edwards Computer Foundation. So there's no reason for us to offer high level courses. But people need to practice their skills, and this is where the Freswota CRC comes in. It's too expensive right now for the average ni-Vanuatu to own their own computer. But they can come to the CRC and spend as much time as they like honing their skills because our prices are very low – only 150 vatu per hour."
>
> The CRC also operates as an Internet cafe, allowing members of the local community to use computers, email and other Internet resources for a very low fee. The center is open between 8:00 a.m. and 8:00 p.m. from Monday to Friday, and from 1:30 to 6:00 p.m. on Sundays.
>
> Prices are kept low because the Freswota CRC uses old computers donated by an Australian church group. It combines this hardware with Ubuntu Linux, software specially designed for education in developing countries. "This means that people can still make use of computers that would otherwise have been thrown away," McGarry said.
>
> Importantly, the project was mostly self-funded. While FSP's Pacific Skills Link project has provided technical staff, it has contributed a relatively small amount of cash to the center. In contrast, some other computer installations have required millions of vatu in construction and installation costs.
>
> The CRC should remain independant from outside funding, relying only on revenues to cover costs and replace equipment. "If this experiment succeeds," said McGarry, "it will be because the community supports it."
>
> If it does, then communities throughout Vanuatu will have a model to follow to improve education and communications affordably and sustainably, without requiring huge donor or government funding.

In the Freswota CRC we see that sustainability may be achieved even in grassroots projects and that FOSS empowers locals to take on projects that economically could not be justified by an organization using proprietary software.

9.2.2 Large Company

The IT manager of a large group of companies, with the head office of its holding company in Suva, Fiji Islands, shared his experience. The group has a range of supermarkets, vehicle retail outlets, hardware shops, a shipping agency, a finance range and an industrial and marine range of stores. They are presently in the process of establishing the IT department as a separate entity.

In 2001, the company decided to migrate to the Linux platform on the advice of its overseas IT vendors. Based on this advice, the IT Manager developed a proposal that was submitted to the Board for approval. The Board was very supportive and decided to hire a consultant from Brisbane, Australia to carry out a feasibility study of the proposed

plan. The consultant recommended the implementation of Linux. A trainer was hired for 2 weeks to train the staff for this migration to the Linux system.

Initially, cost and stability were the major factors for this company in the decision for the Linux platform. They were advised by their vendors to go with Linux, since, according to these vendors, it was more stable than Windows. The vendors shared their experience that Windows would crash more often in situations of high resource demand and that while using the Linux platform, they found their application less resource hungry and the whole system more stable.

The current setup compares favorably when considering hardware cost. One alterative scenario the IT department considered was running on an IBM AS400 server. Initial hardware cost of this scenario would cost at least 40% more than the current solution. Furthermore, it would be much more expensive to upgrade and repair the hardware. At this time one Intel Xeon-based server runs the whole group of companies. According to the IT Manager, implementing Linux has paid off. They have not measured the resulting cost savings precisely, but state that they could not put in another system at lower cost that would be more stable. He stated that if another system was implemented (for example a Windows-based system), they anticipate the overall cost to be 3 or 4 times more for similar output. Another advantage for the company, according to the IT Manager is, that they have enjoyed a good path of technology; at present they are using web based applications, such as the Customer Loyalty application that has been written using open source software. Additionally, he said, they are satisfied with the response from the FOSS community online when they seek help with any problems they encounter. According to their experience, response from the FOSS community is usually quicker compared to paid vendors, who usually place clients in a queue and take longer to reply.

Presently, the IT Department of this company has a total of 15 staff: 6 software development staff, 5 network support staff, 3 technicians and an IT Manager. According to the IT Manager, one of the crucial factors of their success is the highly motivated and confident staff. They usually recruit staff showing high aptitude during the recruitment process. Once they have proven their capabilities, the company invests in further training. It provides attractive packages such as a company vehicle, etc. to high caliber staff. In a recent experience, two new USP graduates were hired, both without prior experience with FOSS. Under the guidance of the IT Manager and his Assistant (who is a certified Linux engineer and has been with the company since 1996) these new employees have developed a Customer Loyalty application using open source software. This has saved the company about F$200,000 it would otherwise have spent and the project was completed within four months only. The staff is very pleased with the skills that they have acquired in developing this application as this has made them more marketable in the future. If similar developments continue, the company envisages increasing their salary. According to the IT Manager employees get a “kick” out of developing software themselves.

There were no major hurdles in implementing Linux. Recently, some minor problems showed. They have started to use the Red Hat Linux Enterprise, but their overseas vendor has not yet switched to the same version. Therefore, sometimes they encounter problems that the vendor has not yet come across. However, the vendor is also migrating to this version within the next few months, so it is anticipated that this will not be a concern in coming months.

The IT Manager feels that large companies in the Fiji Islands are hesitant to adopt this approach for various reasons. One being a fear to change to a new system (presumed) without support. Additionally, he states some companies are controlled by a

head office overseas which has inflexible standards in place that do not allow staff the freedom to be innovative and thus hinders them in taking advantage of the latest technological development. Changing these standards is usually a long process. IT employees in these companies feel stifled by such environments as they do not get a chance to explore opportunities for technology advancement.

The IT Manager also felt strongly that tertiary institutes like USP should offer courses that give students opportunities of utilizing FOSS.

10 RECOMMENDATIONS

This survey aimed at discovering obstacles to achieving benefits from the use of FOSS and the issues that need to be addressed before the region can maximize these benefits. In particular, the questions addressed about awareness were:

1. Are people in the region aware of FOSS?
2. Do they understand the principles of FOSS, of proprietary software, and of the FOSS licenses?
3. Are they able to apply their knowledge to classify popular packages as either FOSS or proprietary software?
4. What are the sources of knowledge?
5. What is the quality of the sources?
6. What are the reasons for lack of knowledge?

And the questions about usage were:

1. What is the extent of FOSS usage?
2. Who uses it?
3. How and for what purpose is it used?
4. Why do they use or not use it?

Discussion

1. The research found a great lack of knowledge and awareness of FOSS in the Pacific island countries. However, does this mean that in order to improve the benefit derived from using FOSS we simply need to raise awareness of FOSS? While this might start change in the different sectors, in particular for the government sector's software usage, it seems that consultation including a cost-benefit analysis would need to be conducted. Literature reviews indicate that other countries – including developing countries – have benefited from FOSS use. Do the differences between PICs and these countries allow the conclusion that PICs would benefit from FOSS use? At this point any answer to this question will be speculative. However, all these countries have their individual differences and peculiarities. It is not the case that these countries are all similar and that just the Pacific island

countries differ from all of these countries; there is great diversity among them. Whatever their individual situation was, they were able to derive great benefit from FOSS in sometimes very original ways. Therefore, it is plausible to say that the distinctive features of the situation in PICs will not hinder deriving similar benefits in PICs in principle. Of course, aspects such as size of population and distance from major markets might influence the specific way in which these benefits are realized. Countries' regulatory laws on copyright could also be an important factor. In many PICs existing laws are presently not sufficient to protect proprietary software and unauthorized copying of software is known to be widespread.

2. At the same time, we can observe a bottom up approach in FOSS use and development. Use is commonly started by an interested person's initiative rather than policy driven by the government. If private sector organizations do not use or not benefit from it, one reason might be that they do not need to consider cost reduction in their business due to lack of competition. Or, they do not recognize some basic benefit of ICT such as increasing efficiency of their business. Additionally, it might be due to less matured technology sector in the Pacific island countries since people optimize their benefit with the best options. If a country such as Fiji orients towards ICT industry in their national development plans, above a certain level of maturity it could lead to new industries as well as competitiveness, leading to a more open economy. These are some possibilities that could be discussed by the public and the private sectors.

More specifically, analysis of the data in answer to our research question revealed the following obstacles to maximizing the benefits of FOSS:

- general lack of awareness of FOSS applications, FOSS principles and FOSS licensing
- lack of financial incentive to evaluate FOSS alternatives
- no stable, low-cost, and fast Internet access
- FOSS usage not integrated into government ICT strategy and policy
- migration difficulties, for example lack of user training facilities
- lack of support structure and catalyst
- curricula and education do not adequately integrate FOSS.

We elaborate these obstacles and present possible solutions and recommendations for each problem.

10.1 Awareness

10.1.1 Lack of incentive

Problem One of the reasons for the very low awareness of FOSS is the lack of financial incentive to explore alternative software solutions including FOSS, although FOSS may be far cheaper than proprietary software. This is due to the widespread unauthorized copying of proprietary software. The use of unauthorized copies, though initially

free, can lead to unforeseen costs, for example through sudden implementation of modified laws. It also keeps organizations from exploring software solutions that potentially are technically superior.

In many countries proprietary vendors have already started campaigns against the use of illegally copied software. Campaigns involve police raids of organizations suspected of using such software, the offer of not charging organizations that come forward on their own to allow proprietary vendors to assess their licensing needs, advertisements in a variety of different media and other means.

Similar campaigning has already started in Fiji (and possibly other Pacific island countries). One example is the placing of large advertisements in local newspapers. It can be assumed that this campaigning has just begun. Consequently, there is substantial risk in the future that organizations might be forced out of business due to licensing and other previously unforeseen costs that they would face in the event of changes in enforcement policies.

Possible solutions Organizations need to be made aware of licensing (both proprietary and FOSS). The current networks of small business organizations, industrial and professional associations, government and non-government organizations can be utilized to increase the awareness of licensing issues. These various organizations organize workshops, seminars, conferences and similar gatherings for various purposes. These gatherings can be utilized to disseminate information on the principles of FOSS and proprietary software and of FOSS licensing.

Recommendations

- That workshops organized for small business training by organizations such as the Fiji Trade and Investment Board, Indigenous Small Business Association, Vanuatu Small Business Womens Association, Bank of Samoa and others in the Pacific region, include training on licensing issues, both proprietary and FOSS.
- That industrial and professional organizations such as the Fiji Institute of Accountants, Fiji Chamber of Commerce, Fiji Tourist and Hotel Association, South Pacific Computer Society and sister organizations in the Pacific island countries educate their members about the above mentioned dangers of unforeseen software costs due to changes in laws and the alternative FOSS solutions at their conference and other meetings.
- That regional organizations such as South Pacific Forum and South Pacific Regional Environment Programme be utilized to circulate information on proprietary and FOSS licensing issues.
- That the University of the South Pacific establish itself more prominently as a provider of information and education on FOSS in general and licensing issues of proprietary software and FOSS in particular.

10.1.2 General lack of awareness

Problem Apart from lack of licensing knowledge many respondents are unaware of FOSS at all or have very little awareness of it. Some of them, though unaware of what FOSS is, are actually using FOSS applications mainly because it was available “free”

(as in *free beer*). This unawareness of FOSS and its benefits clearly hinders the users from maximizing the benefits.

Possible Solutions The survey reveals that the Internet, magazines and work colleagues are the main sources of information on FOSS. While the number of people obtaining information from newspapers is lower, these people had a better understanding of the principles than people not using newspapers as a source. It may be the case that the number of people is lower for newspapers even though newspapers are widely circulated and read, because the number of articles in newspapers on FOSS is very low. While newspapers in neighboring Australia and New Zealand carry regular weekly columns on information technology, such is not the practice in PICs. Increasing the amount of authoritative FOSS information through newspapers could lead to increased FOSS awareness.

Recommendations

- That efforts to increase awareness be emphasized on the Internet and magazines
- That IT work colleagues belonging to organizations such as South Pacific Computer Society, Fiji Computer Society, Pacific Linux and Unix User Group, Pacific Islands Chapter of the Internet Society and IT organizations form a common forum for sharing FOSS information
- That authoritative FOSS personnel (including the recommended common forum), in the spirit of Open Source, volunteer to produce regular columns on FOSS in *Fiji Times* and other PIC newspapers. That publications and reports on FOSS be released to local newspapers as press releases.

10.2 Usage

10.2.1 Network infrastructure

Problem The research found that among the sources of FOSS information the Internet was named most often. However, accuracy of information obtained from the Internet on FOSS appears lower compared to information obtained from magazines. We could interpret this in various ways: for instance, people who subscribe or access specific technology magazines may be more financially advantaged or have higher interest in technological advancement to motivate them to read these magazines. We also interpret it as showing the limited access to the Internet. Accessibility of the Internet in the Pacific island countries is relatively low in comparison with most developed countries. As an example, at the time of writing, the amount of money that buys 25 hours of dial-up modem access in the Fiji Islands buys an unlimited (with respect to both time and volume) DSL access with 40 times the bandwidth of the modem access in Germany. Compared with Japan this ratio is even more dramatic, with customers being offered unlimited DSL access 1000 times as fast as the dial-up modem access in the Fiji Islands for the same price. Adequate access is, of course, important for disseminating and acquiring information, and stable and cost reasonable Internet access is highly conducive in order for developers to join the FOSS projects. Also, for promoting and utilizing FOSS, stable and reasonable network access is a tremendous help.

Recommendation

- That the regional governments strive for cheaper, reliable and faster Internet access comparable to developed nations
- That PICs in conjunction with IT organizations develop a network to support a regional repository of FOSS and distribution via DVD/CD for those users who do not have reliable connection to the Internet
- That, since for FOSS developers access to reliable internet is a must, FOSS developers be granted concession or privileged access to the Internet.

10.2.2 Government initiative

Problem We could not find any government initiative to encourage FOSS utilization in any of the PICs. Some government departments and sections already use FOSS, but where it is done it is not done explicitly as part of government's strategy or vision. Maybe this is due to lack of awareness of FOSS among government policy makers and planners. It could also be due to their lack of recognition of FOSS as a necessity for good and stable access to the Internet. To increase the knowledge and awareness of FOSS ultimately, the first priority should be to advocate increased use of basic ICTs among the government officials.

Recommendation

- That government officials be educated on FOSS and that the regional governments develop ICT policies (including procurement policies) in general and in FOSS in particular.

10.2.3 Migration

Problem Some organizations that are aware of FOSS have difficulty in migrating to FOSS due to the lack of training facilities and the cost of migration.

Recommendation

- That the development of documentation comparing features of proprietary and FOSS applications such as MS Word and OpenOffice to assist in migration to FOSS be promoted
- That awareness and use of open textbooks and manuals be promoted
- That instructors be trained to assist this migration (see also the next problem and recommendation).

10.2.4 Support structure and catalyst

Problem Appropriate knowledge and skills are required to utilize FOSS. One of the major constraints of FOSS utilization is the lack of a support system and its access. More engineers and instructors of FOSS are required if people are to benefit fully from

FOSS use. But who would be the catalyst? Private sector organizations, such as ICT education providers, who are usually profit oriented, would join once demand is confirmed (according to statements made by respondents from such organizations in the course of the interviews). In order to create that high level of demand, some groups such as such as the Fiji Computer Society, CROP, and donors would need to become the catalysts. USP could be the best candidate to take this initiative in consideration of its position in the educational sector in the region and its accessibility to current technical advantage such as AARNet and the upcoming ICT Centre. FOSS has a voluntary nature as it encourages sharing and clearly recognizes and respects copyrights, but in different ways compared to propriety software. In the PICs, we find some issues against both concepts, which might be rooted in the indigenous culture of sharing. Organizations that take initiative to promote increased FOSS use need to recognize such differences and enlighten the community carefully.

Recommendation

- That organizations such as Fiji Computer Society, South Pacific Computer Society, CROP and USP take the lead in being the catalyst in building an "Institute of FOSS" or host a "Centre of Excellence in FOSS" to provide systems support, train engineers and FOSS instructors
- That the FOSS instructors be trained in evaluating and reviewing FOSS relevant to organizations and individuals in PICs
- That an evaluation and review on FOSS relevant to operations in PIC organizations be made available to potential users.

10.2.5 Curricula and education

Problem Currently, teaching at USP related to software and its use has a bias towards proprietary software. Any student who has taken a single CS or IS course should be expected to have a basic knowledge about the concepts (FOSS and proprietary software). We suggest assuring that in the future there will not be such a bias. In particular, at the 100-level the FOSS programs should be taught in at least as much depth as the proprietary software.

We feel that USP should lead by example: official policy should, for example encourage and/or require the use of open standards in the exchange of files. Instead of sending/publishing Word-, PowerPoint-, or Excess-only formats users should send/publish PDF, Rich Text Format, plain text, or HTML files. Similarly, ITS should specifically offer training for FOSS alternatives to widespread proprietary packages and existing courses should be reviewed at least to address proprietary and FOSS evenly.

At secondary school, there is very little awareness and no usage of FOSS. While the number of PCs in secondary schools is slowly increasing, software costs remain a major obstacle to increasing the number of PCs. Current proprietary software require high performance more expensive hardware, while FOSS in general does not demand such high powered hardware.

Recommendations

- That the curriculum at tertiary and secondary schools include FOSS

- That the CS and IS curricula at USP be revised to ensure that there is enough comparable emphasis on FOSS and proprietary software and that it sufficiently addresses the phenomenon of FOSS
- That a programme to provide primary and secondary schools with cheaper computers installed with relevant light weight FOSS systems and applications be promoted, to increase the awareness of usage of FOSS while at the same time improving the ICT capacity of PIC primary and secondary schools
- That organizations such as teacher training institutes, the PIC Ministries of Education, teaching associations such as Fiji Teachers Association, provide training to teachers, including curriculum developers, on FOSS
- That the USP BEd program in Computer Studies and other teaching qualification programmes include FOSS education.

11 CONCLUSION

FOSS has become one of the major forces driving the development of software. It has a great number of benefits including cost reduction, capacity building, transparency and security. There are also some requirements for its use, including (a beginning) assistance, access (including but not limited to Internet access), non-discriminating procurement policies and awareness of the wealth of FOSS available.

It seems that all of these requirements can be met in the countries of the region.

We had hypothesized that FOSS is not used much in the region. This turned out to be the case. However, we had hoped that the non-use would be specific to an identifiable group or category of people. So far, with the data we collected, we have not been able to define a specific category of people that are using FOSS significantly less than other groups. The only group where FOSS use is somewhat stronger than in the others are the regional organizations, larger ones in particular.

With the widespread need for information on FOSS, it seems that improving availability of information on FOSS is the area at which all activities should aim.

A ACRONYMS

BEd Bachelor of Education

BSD Berkeley Software Distribution

CEO Chief Executive Officer

CIO Chief Information Officer

CMF Content Management Framework

CPU Central Processing Unit

CRC Computer Resource Center

CROP Council of Regional Organizations in the Pacific

CS Computing Science

CSV Comma Separated Values

DFL Distance and Flexible Learning

DNS Domain Name Service

DSL Digital Subscriber Line

DTML Document Template Markup Language

EU European Union

FOSS Free and open Source Software

FOSSFA Free and Open Source Software Foundation of Africa

FSF Free Software Foundation

FSP Foundation for the Peoples of the South Pacific

GDP Gross Domestic Product

GNU GNU is Not Unix

GPL GNU General Public License

HTML Hypertext Markup Language

ICT Information and Communications Technology

IIS Internet Information Server

IS Information Systems

IT Information Technology

ITC Information Technology and Computing Services

ITS Information Technology Services

JDK Java Development Kit

JRE Java Runtime Environment

LLB Legum Baccalaureus (Bachelor of Laws)

PC Personal Computer

PDF Portable Document Format

PIC Pacific Island Country

PLUG Pacific Linux and Unix User Group

SILUG Solomon Islands Linux User Group

SML/NJ Standard ML of New Jersey

SOPAC South Pacific Applied Geoscience Commission

TCO Total Cost of Ownership

UK United Kingdom

US United States

USP University of the South Pacific

VIT Vanuatu Institute of Technology

XML Extensible Markup Language

ZEO Zope Enterprise Objects

ZMI Zope Management Interface

B QUESTIONNAIRES

B.1 Questionnaire for Organizations

Baseline Survey on Free and Open Source Software in the South Pacific: Knowledge, Usage, Perception, and Potential

We invite your organization to participate in a new research project that we are undertaking within the 12 USP member countries. Experience reported from numerous projects and international institutions suggests that free and open source software has particular features that are inducive to not only cost reduction, but also in supporting sustainable development of software and capacity building. It is assumed that the benefits of FOSS can be brought to bear in the Pacific region. However, very little information is available regarding its use, although there is evidence of its use by a few institutions. This research revolves around a central question: "How can *we* benefit from FOSS?" or paraphrased "What do *we* need to do to derive benefit from FOSS?" In order to attempt to get information on this question, this research seeks answers on the extent of FOSS usage, knowledge and awareness, perception, contribution and potential of use in future.

Based on the results of a sample taken earlier, your organization was identified for interview. We are inviting you to participate in this one-on-one interview to be conducted by a member of our research team. The interview should take approximately 30 minutes and will be scheduled at a time and place that is most convenient to you. Your decision to participate is completely voluntary; however, we sincerely hope that you would agree to participate. All participating organizations will be given a full research report and forwarded further information on FOSS.

Please note:
All records of the content of the interview will be held strictly confidential. No individuals will be identified and reported with the final written report. All raw data will be held by the four researchers listed below and will not be distributed to any unauthorized individuals. All personal identification such as names on the survey forms will be removed.

Further information on the research can be obtained from any of the three researchers listed in here.

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Research Assistant - ICT Capacity Building @ USP Project

Interviewer: _____ Interview Date:_____

Country

1. ☐ Cook Is
2. ☐ Fiji Is.
3. ☐ Kiribati
4. ☐ Marshall Is.
5. ☐ Nauru
6. ☐ Niue
7. ☐ Samoa
8. ☐ Solomon Is.
9. ☐ Tonga
10. ☐ Tokelau
11. ☐ Tuvalu
12. ☐ Vanuatu

Section 1: Background Information

1. Name ***(optional)***_____ 2. Organization _____

3. Dept./Unit _____ 4. Occupation *(see additional notes)*_____

5. Email _____ 6. Phone _____ 7. Fax _____

8. Website address _____

9. Gender a☐ Male b☐ Female

10. Country of origin of interviewee a☐ local b☐ expatriate

11. Age a☐ 20-24 b☐ 25-29 c☐ 30-34 d☐ 35-39 e☐ 40-44 f☐ 45-49
g☐ 50-54 h☐ 55-59 i☐ 60-64 j☐ 65-69 k☐ 70+

12. Highest qualifications obtained and please specify if these were obtain from a local or overseas institute. *(Tick all that apply)*

a☐ PhD	i☐ local institute	ii☐ overseas institute	iii☐ acquired online from overseas
b☐ Masters	i☐ local institute	ii☐ overseas institute	iii☐ acquired online from overseas
c☐ Degree	i☐ local institute	ii☐ overseas institute	iii☐ acquired online from overseas
d☐ Diploma	i☐ local institute	ii☐ overseas institute	iii☐ acquired online from overseas
e☐ Certificate	i☐ local institute	ii☐ overseas institute	iii☐ acquired online from overseas
f☐ Others	i☐ local institute	ii☐ overseas institute	iii☐ acquired online from overseas

Section 2: Organizational Profile

13. What is the category that best fits your organization? Please specify its main services *(see additional notes for this)*?

1☐ Government and Public Sector _____
2☐ Regional Organization _____
3☐ Private Sector _____
4☐ Civil Society_____
5☐ Other, please specify_____

14. How would you best categorize your organization?

a. Number of employees
1. ☐ not more than 5 persons
2. ☐ 6-20 persons
3. ☐ 21-100
4. ☐ more than 100 persons

b. Turnover or total assets
1. ☐ not more than $30,000
2. ☐ between $30,001 - $100,000
3. ☐ between $100,001 – F500,000
4. ☐ between $500,001 - $2 million
5. ☐ more than $2 million

c. Foreign exchange earnings
1. ☐ not more than $30,000
2. ☐ between $30,001 - $500,000
3. ☐ between $500,001 - $2 million
4. ☐ more than $2 million
5. ☐ Not applicable

Section 3: Knowledge and Awareness of FOSS

15. Have you previously heard of free and open source software (FOSS)?1☐ Yes*(goto Q17)* 2☐ No *(goto Q16)* 99☐ NR

16. Would you like to know more about FOSS?
1☐ Yes, why _____
2☐ No, why _____*(goto Q21)*
99☐ NR

17. If yes, how did you come to know about FOSS? *(Tick all that apply)*
a☐ Newspaper b☐ Internet c☐ Magazine/journals d☐ Television e☐ Conference/workshop
f☐ Work colleagues g☐ Radio h☐ Friends i☐ Academics j☐ FOSS community
k☐ During studies l☐ Training m☐ Other, please specify_____ n☐ NR

18. What is your understanding of FOSS? *(Tick all that apply)*
☐ True ☐ False ☐ Not sure ☐ NR a. It is software that is distributed freely to anyone interested.
☐ True ☐ False ☐ Not sure ☐ NR c. It allows users access to the programs source code.
☐ True ☐ False ☐ Not sure ☐ NR d. It allows users to modify the source code.
☐ True ☐ False ☐ Not sure ☐ NR e. It allows users to redistribute the modified software.
☐ True ☐ False ☐ Not sure ☐ NR g. Its license should not include unreasonable restrictions.

19. Now we would like to ask about General Public License (GPL) and Berkeley Systems Distribution (BSD) License. Do you know what GPL and BSD Licenses stand for?
1☐ Yes 2☐ No *(goto Q21)* 99☐ NR

20. What is your understanding of GPL and BSD license? *(Tick all that apply)*
☐ True ☐ False ☐ Not sure ☐ NR a. The GNU Public License (GPL) allows you to make any changes to the FOSS software as you may wish.
☐ True ☐ False ☐ Not sure ☐ NR b. The GPL requires that all changes to the software are publicly distributed.
☐ True ☐ False ☐ Not sure ☐ NR c. The BSD License allows you to make any changes to the software as you may wish.
☐ True ☐ False ☐ Not sure ☐ NR d. The BSD License requires that all changes to the software are publicly available.

Section 4: Usage of FOSS

21. Does your organization have IT personnel(s)? 1☐ Yes 2☐ No *(goto Q24)* 99☐ NR
(Please see the additional notes)

22. If yes, how many IT people does your organization employ?
1☐ Total _____ 2☐ Fulltime_____ 3☐ Part time _____ 99☐ NR

23. Does your organization have Local Area Network (LAN)? 1☐ Yes 2☐ No *(goto Q24)* 99☐ NR

24. Who manages the network and/or IT requirements of your organization?
1☐ Outsource to an IT company 2☐ Call in an IT company when required only
3☐ Our staff 4☐ the IT Dept. within our organization. Specify_____
5☐ Other, please specify _____ 99☐ NR

25. Does your organization provide IT services to other company/org(s).? 1☐ Yes 2☐ No *(goto Q27)* 99☐ NR

26. If yes, please tick all kinds of services that it provides. *(Tick all that apply)*

1☐ Computer maintenance and engineering
2☐ Computer supplies and accessories
3☐ Off the shelf software packages
4☐ Network design, planning and installations
5☐ Programming and system analysis
6☐ Hardware repair
7☐ Multi-processing UNIX servers
8☐ Telecommunications systems
9☐ Computer training
10☐ Software upgrades and repairs
11☐ Routers/ADSL/DSL support
12☐ Cable installation
13☐ Support for EFTPOS machines
14☐ Web design, development & hosting
15☐ Helpdesk for IT support
16☐ Software & licensing training
17☐ Design & implementation of customized software applications
18☐ Other, please specify _____ 99☐ NR

27. Is your organization using Proprietary Software, e.g. Windows XP, etc.

1 ☐ Currently using
2 ☐ Used before but not using now. Why? _____
3 ☐ Planning to use within the next 3-5 years
4 ☐ Not using now, thinking of using in future but not decided yet
5 ☐ Not using now and have no plans to use in future
90 ☐ Don't know 99 ☐ NR

28. Is your organization using Open Source Software, e.g. Linux, Apache, mySQL

1 ☐ Currently using
2 ☐ Used before but not using now. Why? _____
3 ☐ Planning to use within the next 3-5 years
4 ☐ Not using now, thinking of using in future but not decided yet *(goto Q30) but do not ask Q30.1and Q31.1*
5 ☐ Not using now and have no plans to use in future *(goto Q30) but do not ask Q30.1and Q31.1*
90 ☐ Don't know 99 ☐ NR

29. While using FOSS did your organization

☐ Yes ☐ No a. Modify the software to our needs
☐ Yes ☐ No b. Redistribute the software freely after modifications
☐ Yes ☐ No c. Seek assistance in installation and maintenance
☐ Yes ☐ No d. Encounter major difficulties in using
☐ Yes ☐ No c. Reported bugs to online community

30. What proportion of software used in your organization is available under

1 ☐ open source license, No. of packages_____ and No. of copies _____
2 ☐ proprietary license, No. of packages_____ and No. of copies _____
90 ☐ Don't know 99 ☐ NR

31. Please give an estimate of your organizations software budget in 2004 for

1 ☐ open source license $_____ and % of total software budget
Please estimate the % of this that was spent for
1 %_____ licensing
2 %_____ support and maintenance
3 %_____ other, please specify _____

2 ☐ proprietary license $_____ and % of total software budget
Please estimate the % of this that was spent for
1 %_____ licensing
2 %_____ support and maintenance
3 %_____ other, please specify _____

32. In your organization, please describe the process of how it was decided to use particular software? _____
_____
_____

33. The following table is a selection of Proprietary and FOSS software packages. Please indicate whether you are aware of each package or have used each one and the reasons for doing so. *(Tick all that apply)*

Package	Pro-prietary	FOSS	Used \	Still using	Reasons
a. GNU/Linux	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
b. Apache	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
c. OpenOffice.org	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
d. Mozilla/Konqueror	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
e. MS Office	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
f. Windows XP	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
g. Macintosh OS	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
h. MySQL/PostgreSQL	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
i. JAVA	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
j. Oracle	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
k. Windows Media Player	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
l. Real Player	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
m. Explorer	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
n. Netscape	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
o. Others, please specify.	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	

34. Please select where FOSS is used specifically. *(Tick all that apply)*

1☐ Infrastructure (network, server, etc) 2☐ Administration 3☐ Finance
4☐ Teaching 5☐ Student Labs 6☐ Research
7 ☐ Production 8 ☐ Medical 9 ☐ Manufacturing
10☐ PCs for client applications 11☐ Database 12☐ Creating websites
13☐ Banner system 14☐ Scheduling 15☐ Project management
16☐ Inventory management 17☐ Resource planning 18☐ Training
19☐ Audio/Video production 20☐ Software development 21☐ Other, please specify_____
90 ☐ Don't know 99☐ NR

35. Now I will present to you several criteria that can influence a decision in favour of or against FOSS. Please tell me, how important each of the following criteria was in your decision to favour of or against Open Source.

1=very important	2=important	3=neither nor	4=less important	5=not important	90=don't know	99= NR

Criteria	1	2	3	4	5	90	99
1. Open and/or modifiable source code							
2. Low or no license fees							
3. Better price to performance ratio							
4. Higher performance							
5. Higher stability							
6. Better protection against unauthorized access							
7. Better functionality							
8. Higher number of potential applications							
9. Open Source applications were already integrated into the Open Source Server.							
10. Lower hardware costs for FOSS.							
11. Cost savings regarding installation, integration and customization to company needs							
12. Cost savings regarding daily operations, administration and support							
13. Cost savings regarding training and introduction of users							
14. FOSS recommended as a better alternative by IT personnel, media, Internet, etc.							
15. Existing solutions, know-how and/or experiences in your company regarding Open Source server operating systems							
16. Better response with bug fixes and/or support							
17. Less reliance on a particular vendor							
18. Better inter-operability with other products due to open standards							
19. FOSS used for internal purposes and Proprietary for external communications.							
20. Other, please specify							

36. Is FOSS used by; *(Tick all that apply)*

1☐ IT personnel 2☐ Students 3☐ Administrative staff 4☐ Clerical staff
5☐ Others, please specify _____
6☐ none 90☐ Don't know 99☐ NR

37. Who provides support for FOSS products in your organization? *(Tick all that apply)*

1☐ In house staff 2☐ Software company/paid supplier
3☐ FOSS newsgroup 4☐ Websites
5☐ Friends/relatives 6☐ other, please specify
90☐ don't know 99☐ NR

38. Does your organization train staff and users on FOSS products?

1☐ Yes. How? _____
2☐ No 90☐ don't know 99☐ NR

Section 3: Perception of FOSS

39. How important is the FOSS for your company?

1☐ very high 2☐ high 3☐ medium 4☐ low
5☐ very low 90☐ don't know 99☐ NR

40. Now I have some questions on the general use of FOSS in your company. They are not related to any specific IT area. In the following, I will present a number of statements to you. Please, tell me for each statement how much it applies to your company. For your answer, you can use the following range:

1=totally agree	**2=somewhat agree**	**3=neither nor**	**4=somewhat disagree**	**5=totally disagree**	**90=don't know**	**99=no answer**

Statements	**1**	**2**	**3**	**4**	**5**	**90**	**99**
1. FOSS is used because people want to be more independent from the pricing and licensing policies of the big software companies.							
2. Using FOSS supports the Open Source community.							
3. Open source development is the most efficient way to develop software.							
4. FOSS is superior in quality to proprietary software.							
5. Proprietary software is generally better supported than FOSS.							
6. Proprietary software has its uses.							
7. Some proprietary software is high quality.							
8. It is difficult to find FOSS for specific requirements.							
9. FOSS maintenance is more expensive than proprietary software.							
10. Hardly any FOSS competent people around us to support its use.							
11. FOSS use is good for internally use.							
12. FOSS use externally is not good as not compatible with many other proprietary software users.							
13. FOSS users need to have more than basic PC applications knowledge to sustain its use.							

41. Within your organization, are there people who are supportive of FOSS?
1☐ Yes, who are these people *(specify job titles)*_____
2☐ No 90☐ don't know 99☐ NR

42. Are there people within you organization who are against FOSS use?
1☐ Yes, who are these people *(specify job titles)*_____
2☐ No 90☐ don't know 99☐ NR

43. Why do these persons support or discourage FOSS use within your organization?
_____

44. What are your most important sources of information on FOSS? *(Tick all that apply)*
a☐ Newspaper b☐ Internet c☐ Magazine/journals d☐ Television e☐ Conference/workshop
f☐ Work colleagues g☐ Radio h☐ Friends i☐ Academics j☐ FOSS community
k☐ During studies l☐ Training m☐ Other, please specify_____ n☐ NR

45. What have been your greatest concerns about FOSS?

1=very important	**2=important**	**3=neither nor**	**4=less important**	**5=not important**	**90=don't know**	**99=NR**

Criteria	**1**	**2**	**3**	**4**	**5**	**90**	**99**
Inter-operability							
Identification of relevant software							
Managing in-house projects							
Maintenance & support for troubleshoot							
Compatibility with other users, particularly external users							
Modification of source code							
Skilled personnel in FOSS							

Section 4: Participation and Contribution to FOSS community ***(for non-users skip this section)***

46. What would best describe your level of involvement in open source software?
    1 ☐ Use open source software, but do not participate in development to any extent.
    2 ☐ Indirect contribution to open source software development, e.g. filing bug reports, project administration on a moderate scale.
    3 ☐ Contributing directly to the development work of open source software projects (including documentation) on a significant scale.
    90 ☐ don't know 99 ☐ no answer

47. If answered 2, 3 to the above questions, please state if any of these contributions are linked within the Pacific region?
    1☐ Yes, please state these collaborations _____
    _____
    _____
    2☐ No 90☐ don't know 99☐ NR

48. Does anyone in your organization track FOSS developments outside your organization?
    1☐ Yes, please state how this is done _____
    _____
    2☐ No 90☐ don't know 99☐ NR

49. What have been your greatest concerns for FOSS development?_____
_____

Section 5: Potential Usage of FOSS

50. Who is responsible for making software purchasing decisions? *(Tick all that apply)*
    1 ☐ The CEO 2 ☐ IT Manager 3 ☐ Human Resources Manager
    4 ☐ Personally as its for personal use 5 ☐ Other 90☐ don't know 99☐ NR

51. How much flexibility do individuals have in using FOSS within the organization?_____
    _____

52. Do you look to any outside bodies for guidance on what software to purchase?
    1 ☐ Yes, who is responsible for doing this research? _____
    _____
    2 ☐ No, please explain how the decision is made? _____
    90☐ don't know 99☐ NR

53. Any additional comments? _____
    _____
    _____
    _____

B.2 Questionnaire for Individuals

We invite you to participate in a new research project that we are undertaking within the 12 USP member countries. Experience reported from numerous projects and international institutions suggests that free and open source software has particular features that are inductive in cost reduction, but also in supporting sustainable development of software and capacity building. It is assumed that the benefits of FOSS can be brought to bear in the Pacific region. However, very little information is available regarding its use, although there is evidence of its use by a few institutions. This research revolves around a central question: "How can *we* benefit from FOSS?" or "What do *we* need to do to derive benefit from FOSS?" In order to attempt to get information on these questions, this research seeks answers on the extent of FOSS usage, knowledge and awareness, perception, contribution and potential of use in future.

Based on the results of a sample taken earlier, you were identified for interview. We are inviting you to participate in this one-on-one interview to be conducted by a member of our research team. The interview should take approximately 30 minutes and will be scheduled at a time and place that is most convenient to you. Your decision to participate is completely voluntary; however, we sincerely hope that you would agree to participate.

Please note:
All records of the content of the interview will be held strictly confidential. No individuals will be identified and reported with the final written report. All raw data will be held by the four researchers listed below and will not be distributed to any unauthorized individuals. All personal identification on the survey forms will be removed.

Further information on the research can be obtained from any of the three researchers listed in here.

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Research Assistant - ICT Capacity Building @ USP Project

Interviewer: _____ Interview Date:_____

Country
1 ☐ Cook Is
2 ☐ Fiji Is.
3 ☐ Kiribati
4 ☐ Marshall Is.
5 ☐ Nauru
6 ☐ Niue
7 ☐ Samoa
8 ☐ Solomon Is.
9 ☐ Tonga
10 ☐ Tokelau
11 ☐ Tuvalu
12 ☐ Vanuatu

Section 1: Background Information

1. Name _____ 2. Occupation _____

3. Email _____ 4. Phone _____ 5. Fax _____

6. Website address _____ 7. Gender a☐Male b☐Female

8. Country of origin of interviewee a☐local b☐foreigner

9. Age a☐20-24 b☐25-29 c☐30-34 d☐35-39 e☐40-44 f☐45-49
g☐50-54 h☐55-59 i☐60-64 j☐65-69 k☐70+

10. Highest qualifications obtained and please specify if this was from a local or overseas institute. *(Tick all that apply)*

a☐PhD	i☐local institute	ii☐overseas institute	iii☐acquired online from overseas
b☐Masters	i☐local institute	ii☐overseas institute	iii☐acquired online from overseas
c☐Degree	i☐local institute	ii☐overseas institute	iii☐acquired online from overseas
d☐Diploma	i☐local institute	ii☐overseas institute	iii☐acquired online from overseas
e☐Certificate	i☐local institute	ii☐overseas institute	iii☐acquired online from overseas
f☐Others	i☐local institute	ii☐overseas institute	iii☐acquired online from overseas

Section 2: Knowledge and Awareness of FOSS

11. Have you previously heard of free and open source software (FOSS)? 1☐Yes *(goto Q13)* 2☐No *(goto Q12)* 99☐NR

12. Would you like to know more about FOSS? *(goto Q20)*
1☐Yes, why _____
2☐No, why _____ 99☐NR

13. If yes, how did you come to know about FOSS? *(Tick all that apply)*

a☐Newspaper	b☐Internet	c☐Magazine/journals	d☐ Television	e☐Conference/workshop
f☐Work colleagues	g☐Radio	h☐Friends	i☐Academics	j☐FOSS community
k☐During studies	l☐Training	m☐Other, please specify_____		n☐NR

14. What is your understanding of FOSS? *(Tick all that apply)*

☐True ☐False ☐Not sure ☐NR	a. It is software that is distributed freely to anyone interested.
☐True ☐False ☐Not sure ☐NR	c. It allows users access to the programs source code.
☐True ☐False ☐Not sure ☐NR	d. It allows users to modify the source code.
☐True ☐False ☐Not sure ☐NR	e. It allows users to redistribute the modified software to others.
☐True ☐False ☐Not sure ☐NR	g. Its license should not include unreasonable restrictions.

15. What is your level of awareness of FOSS?
1 ☐ Slightly aware of open source concepts.
2 ☐ Have sought information about FOSS, but need further information before using.
3 ☐ Have investigated thoroughly on FOSS and have decided to use.
4 ☐ Highly involved in FOSS arena.

16. The following table is a selection of Proprietary and FOSS software packages. Please indicate whether you are aware of each package or have used each one and the reasons for doing so. *(Tick all that apply)*

Package	Pro-prietary	FOSS	Used	Still \ using	Reasons
a. GNU/Linux	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
b. Apache	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
c. OpenOffice.org	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
d. Mozilla/Konqueror	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
e. MySQL/PostgreSQL	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
f. Windows Media Player	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
g. Internet Explorer	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	
h. Others, please specify.	☐	☐	☐ Yes ☐ No	☐ Yes ☐ No	

Section 3: Usage of FOSS

17. Do you provide IT services to others? 1☐Yes 2☐No *(goto Q19)* 99☐NR

18. If yes, please tick all kinds of services that it provides. *(Tick all that apply)*

1☐Computer maintenance and engineering 2☐Computer supplies and accessories
3☐Off the shelf software packages 4☐Network design, planning and installations
5☐Programming and system analysis 6☐Hardware repair
7☐Multi-processing UNIX servers 8☐Telecommunications systems
9☐Computer training 10☐Software upgrades and repairs
11☐Routers/ADSL/DSL support 12☐Cable installation
13☐Support for EFTPOS machines 14☐Web design, development & hosting
15☐Helpdesk for IT support 16☐Software & licensing training
17☐Design & implementation of customized software applications
18☐Other, please specify _____ 99☐ NR

19. Do you use Open Source Software, e.g. Linux, Apache, mySQL

1 ☐ Currently using
2 ☐ Used before but not using now. Why? _____
3 ☐ Planning to use within the next 3-5 years *(goto Q26)*
4 ☐ Not using now, thinking of using in future but not decided yet *(goto Q26)*
5 ☐ Not using now and have no plans to use in future *(goto Q27)*
90 ☐ Don't know *(goto Q25) but do not ask Q25.1and Q26.1* 99 ☐ NR

20. Which activities do you participate in? *(Tick all that apply)*

	Yes	No	NR
1. Version control			
2. Code review			
3. Coding			
4. Testing			
5. Documentation			
6. Bug report			
7. Other, please specify			

21. Who provides support for FOSS products that you use? *(Tick all that apply)*

1☐ In house staff 2☐ Software company/paid supplier
3☐ FOSS newsgroup 4☐ Websites
5☐ Friends/relatives 6☐ Self
7☐other, please specify 90☐ don't know 99☐ NR

22. Have you undergone any training on FOSS products?
1☐ Yes. How? _____
2☐ No 90☐ don't know 99☐NR

23. What do you do when you discover a bug or security problem? _____
_____

24. Do you post questions to FOSS users online?
1☐ Yes 2☐ No 99 ☐ NR

25. If yes, how soon do you get a reply after posting a question in a list? _____

26. Now I will present to you several criteria that can influence a decision in favour of FOSS. Please tell me, how important each of the following criteria was in your decision to favour Open Source software use.

1=very important	**2=important**	**3=neither nor**	**4=less important**	**5=not important**	**90=don't know**	**99= NR**

Criteria	**1**	**2**	**3**	**4**	**5**	**90**	**99**
1. Open and/or modifiable source code							
2. Low or no license fees							
3. Better price to performance ratio							
4. Higher performance							
5. Higher stability							
6. Better protection against unauthorized access							
7. Better functionality							
8. Higher number of potential applications							
9. Open Source applications were already integrated into the Open Source Server.							
10. Lower hardware costs for FOSS.							
11. FOSS recommended as a better alternative by IT personnel, media, Internet, etc.							
12. Better response with bug fixes and/or support							
13. Less reliance on a particular vendor							
14. Better inter-operability with other products due to open standards							
15. Other, please specify							

Section 4: Perception of FOSS

27. How important is FOSS use to you?
1☐ very high 2☐ high 3☐ medium 4☐ low
5☐ very low 90☐ don't know 99☐ NR

28. What are your most important sources of information on FOSS? *(Tick all that apply)*
a☐Newspaper b☐Internet c☐Magazine/journals d☐ Television e☐Conference/workshop
f☐Work colleagues g☐Radio h☐Friends i☐Academics j☐FOSS community
k☐During studies l☐Training m☐Other, please specify_____ n☐NR

29. What have been your greatest concerns about FOSS?

1=very important	**2=important**	**3=neither nor**	**4=less important**	**5=not important**	**90=don't know**	**99= NR**

Criteria	**1**	**2**	**3**	**4**	**5**	**90**	**99**
Inter-operability							
Identification of relevant software							
Maintenance & support for troubleshoot							
Compatibility with other users, particularly external users							
Modification of source code							
Skilled personnel in FOSS							

Section 5: Participation and Contribution to FOSS community ***(for non-users skip to Q.40)***

30. If used or using FOSS, what is your role in the open source project?
- 1 ☐Maintainer
- 2 ☐Both developers & user
- 3 ☐Developer only
- 4 ☐User only 99 ☐ NR

31. Are you a volunteer in your contribution to open source?
- 1 ☐Yes, 2 ☐No
- 1.1 ☐Self employed
- 1.2 ☐Employee (non profit org)
- 1.3 ☐Employee commercial company
- 1.4 ☐Educational institute/research

32. How much have you gained from your participation in FOSS for the followings?

	None	Very little	Little	Quite a lot	Very much
Improvement in programming skills					
Learning new skills					
Knowledge					
Gaining personal reputation					
Getting job opportunities					
Making money					
Other					

33. What is your level of motivation in the following areas?

	No motivation	Little motivation	Motivated	Very motivated	Highly motivated
Programming skills					
New skills					
Love for programming ('hacking')					
Knowledge sharing					
Personal reputation in open source community					
Getting job opportunities					
Limiting the dependency on proprietary software					
Making money					
Other					

34. What are your views on the 'users-to-users' support in open source?

35. How important is peer recognition to you?
1 ☐not important 2 ☐Little important 3 ☐Important 4☐Very important

36. How do you feel about your personal benefit or cost in contributing to open source? _____
_____
_____

37. Is there any incentive for innovation in open source?
1☐ Yes, please elaborate _____
_____
2☐ No, why _____
99☐ NR

38. Are you involved in or aware of any FOSS groups within the Pacific region?
1☐ Yes, please identify these collaborations _____
_____
2☐ No 90☐ don't know 99☐ NR

39. Do you track FOSS developments?
1☐ Yes, please state how this is done _____
_____
2☐ No 90☐ don't know 99☐ NR

40. Further Comments
_____
_____
_____
_____
_____
_____
_____
_____

Thank You.

References

[Anonymous, 2004] Anonymous (2004). LiMux - the IT-Evolution. http://europa.eu.int:80/idabc/servlets/Doc?id=17200. accessed 20050221.

[ATICA, 2002] ATICA (2002). ATICA - Agency for Information and Communications Technologies in the Civil Service - Guide to choosing and using free software licences for government and public sector entities. http://www.adae.gouv.fr/upload/documents/free_software_guide.pdf. accessed 20050221.

[Australian Government Information Management Office, 2005] Australian Government Information Management Office (2005). A guide to open source software for australian government agencies - developing and excuting an ict sourcing strategy. also available as http://www.sourceit.gov.au/__data/assets/pdf_file/42065/A_Guide_to_Open_Source_Software.pdf, accessed 20050530.

[Brod, 2003] Brod, C. (2003). Free software in latin america. http://www.maailma.kaapeli.fi/lamerica.html. accessed 20050412.

[European Union, nd] European Union (n.d.). European F/OSS related research activities. http://europa.eu.int/information_society/activities/opensource/european_activities/index_en.htm. accessed 20050505.

[Ghosh, 2003] Ghosh, R. A. (2003). Licence fees and GDP per capita: The case for open source in developing countries. *First Monday*, 8(12). http://firstmonday.org/issues/issue8_12/ghosh/index.html accessed 20050419.

[Gonzàlez, 2002] Gonzàlez, J. A. (2002). Microsoft's letter to congressman villanueva. http://www.dewtronics.com/peru2ms/alt_ms_to_villanueva.html.

[Government Information Officers' Council, 2003] Government Information Officers' Council (2003). Using Open Source Software in the South African Government. http://www.oss.gov.za/docs/OSS_Strategy_v3.pdf. accessed 20050415.

[IDABC - OSO, 2003] IDABC - OSO (2003). Floss deployment in Extremadura, Spain. http://europa.eu.int/idabc/en/document/1637/470. accessed 20050415.

[Internet World Statistics, 2005] Internet World Statistics (2005). Internet Usage and Population in Oceania. http://www.internetworldstats.com/stats6.htm. accessed 20050511.

[James, 2004] James, C. A. (2004). The care and feeding of foss. http://www.moonviewscientific.com/essays/software_lifecycle.htm. accessed 20050412.

[Kimolo, 2003] Kimolo, N. (2003). The role of african governments in the promotion of open source. http://www.fossfa.net/tiki-print_article.php?articleId=1. accessed 20050412.

[Koch, 2003] Koch, C. (2003). Your Open Source Plan. *CIO Magazine*. also available as http://www.cio.com/archive/031503/opensource.html, accessed 20050221.

[Loscocco and Smalley, 2001] Loscocco, P. and Smalley, S. (2001). Integrating flexible support for security policies into the linux operating system. In *Proceedings of the FREENIX Track of the 2001 USENIX Annual Technical Conference*. also available as http://www.nsa.gov/selinux/papers/freenix01-abs.cfm.

[Nuñez, 2002] Nuñez, E. V. (2002). Congressman villnueva's reply letter to microsoft. http://www.dewtronics.com/peru2ms/villanueva_to_ms.html. accessed 20050427.

[Nuñez and Ackerman, 2002] Nuñez, E. V. and Ackerman, J. R. (2002). Use of Free Software in Government Agencies. http://www.dewtronics.com/peru2ms/free_software_bill.html. accessed 20050427.

[Office of Government Commerce, 2004] Office of Government Commerce (2004). Open source software use within uk government. http://www.ogc.gov.uk/oss/OSS-policy.pdf. accessed 20050505.

[Orlowski, 2003] Orlowski, A. (2003). Asian First-Timers Prefer Linux to Windows. http://www.theregister.co.uk/2003/11/13/asian_firsttimers_prefer_linux. accessed 20050215.

[Perens, 1998] Perens, B. (1998). The Open Source Definition. http://www.opensource.org/docs/definition_plain.html. accessed 20050215.

[Red Flag, 2000] Red Flag (2000). About us. http://www.redflag-linux.com/egyhq.html. accessed 20050502.

[South Pacific Forum Secretariat, 1998] South Pacific Forum Secretariat (1998). The South Pacific Trade Directory of the Pacific Islands. Suva, Fiji.

[Yarney, 2003] Yarney, J. (2003). South Africa taps open source to boost local IT. http://www.pcworldmalta.com/news/2003/Dec/011.htm. accessed 20050416.