

# **THE THEORY OF FOSS AND ITS ACCEPTANCE IN DEVELOPING NATIONS**

by

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This paper is submitted as a partial requirement for the coursework of the online course on the Politics of Free Open Source Software (FOSS), offered by the

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*Course: IAS110 FOSS POLITICAL SCIENCE*

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## **INTRODUCTION**

Free and Open Source Software (FOSS) is on the march across the globe, and it offers a reliable alternative to proprietary, commercial products and addresses the full range of users' needs. For example FOSS Apache provides the majority of web pages due to its huge installed user base, with the last figures showing Apache occupying 67% of all web sites world wide.

Since FOSS is world class, (i.e. it is free to share/distribute amongst individuals, clients, offices, etc.) and can be modified according to an individual's/organization's motives, it may be viewed as a competitor to proprietary and commercial products. For instance, when compared to the existing standard, user-friendly programs that run on Microsoft Windows and Apple operating systems, FOSS offers alternate operating systems that can be used on all computer systems and a range of Internet server software with advanced functionality.

From the viewpoint of voluntary organizations, FOSS offers multiple advantages. The most significant may be considered to be increased cost efficiency, stability and flexibility. Also, legality issues that surround pirated software can be completely avoided and computer-literate volunteers overwhelmingly prefer to work with FOSS because of the collaborative culture of the community. Last but not least, investing in FOSS puts money back into the local economy and helps elevate the skill level.

Despite the fact that in recent times FOSS has become a mainstream phenomenon, it has been operational in a number of third world organizations for quite some time. More often than not, setting up the information technology infrastructure can be a challenge since this process requires specialized skills. Now to meet these challenges, two sets of resources are available: that is Online, where there is a wealth of information and individuals who are willing assist in solving virtually most, if not all problems. What's more, a twenty four (24) hour support industry has emerged where experts will provide everything from customized solutions to maintenance and support.

## **WHAT IS FOSS? WHAT IS IT ATTEMPTING TO ACHIEVE? IS THERE A NEED FOR FOSS?**

According to Wikipedia, FOSS is described as an acronym for Free and Open Source Software. It can also be depicted as “*a blanket term used when the commonalities between Free Software and Open Source Software are more important than their differences.*” Nevertheless, because of its significant philosophical connotations, the term ‘free software’ is used entirely by the Free Software Foundation (FSF), whilst the Open Source Initiative is highly disturbed by the equivocalness of the word "free" and much prefers the term Open Source for marketing reasons.

Software, due to its nature and function is of crucial political relevance, and that computer programmers therefore have considerable responsibility. The case is made that FOSS is of particular political relevance because it challenges established assumptions about production and property. Yet the political significance of software arises not only out of its function but also out of the very nature of the software itself as it poses a challenge to established assumptions of production and ownership.

Originated in the programming sphere itself, FOSS offers a new concept of how to produce, distribute and use software. It is of special political relevance because this concept is in discrepancy to established forms of production and ownership. As such it has been embraced by a number of actors with diverging objectives. This analysis will show that the importance and benefits of FOSS may somewhat differ depending on the body addressed (be it government, consumer, education, or business), the size of consumer and developer community groups, and distinguishing whether the demands focalizes on community utilization or industrial gains.

To begin with, *increasing choice and competition* should be a necessity, since the amount of choices offered to users has significantly diminished. In addition, the appearance of open source software on the Information and Communications Technology locale has initiated the growth of newly designed projects focusing on a variety of factors; some having universal pertinence, even as others are attending to a large extent, lesser areas of

interest. These alternate choices are supposed to be viewed as solutions, since the range of preferences and stages of competition, are significantly increased once ICT alternatives are carefully thought about and debated.

FOSS usage in all sphere of society changes magnitudes annually. Therefore, to a greater extent it can be considered as a feasible solution for numerous developing countries owing to its adaptability and low-cost implications. Consequently, for the most part its implementation is highly progressive outside of North America (in areas such as Asia, Africa and South America), mainly because of the GNU-GPL license, which permits complete transparency of source code. This implies that software can/may be modified by any organization/entity to meet the requirements in accordance with that origination's/entity's goals.

Furthermore, many commercial and non-commercial organizations are substituting proprietary systems with open source software due to its cost and security advantages. Open source software also provides an accessible, legal software option for non-profit organizations in developing countries.

FOSS can be considered as a viable option for the non-profit sectors in developing countries mainly because of their economies. As a result, a great deal of software is frequently downloaded without charge and is perhaps more stable when compared to proprietary software. Although set up and customization may be costly, using open source software is cheaper, since in the long run it frees users from the necessity to purchase software from western markets. Therefore, utilizing an open source approach can be greatly beneficial, individually as well as on a large scale.

Another factor to consider is philosophy (i.e. the support of open standards and protocols), in other words 'software freedom'. The open source model depends on common standards, confidence in the value of transparency, and the thought that producing software is founded on progression and modification, instead of centrally allotted control.

Another constituent is security (i.e. software value, dependability and solidity), in other words 'improved security'. It is possible for any individual to access source code and since open source software doesn't include concealed features, it can be termed to be translucent. On account of this inherent transparency, the European Commission has recommended the use of open source software to members of the European Union.

On the other hand, Non-governmental organizations in developing nations run at the risk of shutting down when repressive governments utilize the existence of unlicensed software as a reason to exploit organizations not in their favor. In the light thereof, supporting organizations, which are perhaps threatened locally, to use open source software, may be able to prevent occurrences of this tendency.

Ultimately, free/open source software is flexible to different requirements, can be localized without difficulty, is gradually more affordable, can be more stable and for that reason in the long run it is a more sustainable option for many non-profit organizations.

## **FOSS AND GOVERNMENT**

### *The use of FOSS in Government and Governmental acceptance of FOSS*

Essential projects, particularly those applied in diverse progression spheres using information and communication technologies, have verified beyond doubt, that their capabilities bring/have positive impact in arranged gatherings with potential targets. It is debated that FOSS usage can/may significantly reduce the cost of implementing and executing such projects, as well as offering local communities the possibility of organizing and controlling the software applications for these projects.

In developing countries, conceiving and implementing national policies regarding free and open source software can/may assist in the distribution and dispersal of information. As a result, this promotes the growth of societies in which information and information access plays a crucial role economically, socially and individually. Governments that have devised favorable policies regarding free and open source software, for the most part, have done so taking into consideration FOSS's capability in creating security and achieving greater/complete control over information systems.

Another reason for devising these policies would be FOSS's inherent capacity to reduce costs regarding digital inclusion programs. Free and open source software also creates a greater limit of capability regarding developmental projects aimed at bridging the digital divide and dispersal of information.

A government's support and acceptance of free and open source software does not exclude the possibility of incurring losses, as well as modifying the character of the Free Open Source Software society. Hence, by restricting and confining themselves from exerting their purchasing power, governments can encourage the FOSS structure, rather than attempting to direct the FOSS community.

Policies regarding Free and Open Source Software should, for the most part, aim at addressing significant government issues, such as connectivity, public procurement, improving and expanding general information technology training programs in education, as well as encouraging and supporting open standards. In the local/national arena,

increasing and encouraging the distribution of Free and Open Source Software involves tactical planning concerning stakeholders, establishing and promoting a FOSS society amongst all stakeholders, and offering training free of charge.

More so, mandatory implementation of free and open source software in the public sector is/can be considered to be severely harmful towards the development of local software industries, as well as for promoting aggressive competition in developing economic systems. Furthermore, government policies are supposed to promote impartial choices between free open source software and proprietary software in order to induce competition-based developments in the software industry. On the other hand, in employing this scientific and industrial neutrality approach, there aren't any successful guarantees as the preference of software model is more reliant on societal measures as opposed to the practical application of science to commerce and industry.



## **FOSS AND DEVELOPING NATIONS**

### ***Why is FOSS more/less suitable for developing countries?***

According to the UNCTAD's "*E-commerce and Development Report 2003*", the information and communication technology (ICT) sphere in developing nations would greatly benefit by adopting the use of Free and open-source software (FOSS), since this gesture can/will "*dramatically improve the digital inclusion of the developing world*".

In so doing, FOSS creates a society in which the formation, allocation and use of information and data becomes an increasingly significant economic and cultural activity; in other words an 'Information Society'. The evidence sustaining this speculation can be found in Alvin Levin-Radian's article "***10 reasons FOSS builds society***" which states that free and open source software promotes 'ICT spending' with local organizations, where capital is allowed to remain 'onshore' and by that means 'valued, employable skills base' are able to thrive locally. This in turn allows qualified and accomplished personnel to remain at base, and at the same time it creates opportunities for additional qualified and accomplished personnel to immigrate, thus '*bringing in talent*.'

Levin also states that free and open source software fosters successful achievements of '*small, medium and micro-enterprises (SMMEs)*,' by switching the 'value capture' inside the Information and Communications Technology organizations from proprietary software expansion to localization (i.e. '*customization and integration*') of accessible FOSS. Successes of SMMEs can also be nurtured through acknowledging individual involvement in software growth and advancement.

Furthermore, FOSS contributes to the growth of practical, independent and observational learning (i.e. the process of acquiring knowledge), of program instructions (i.e. source code) through '*peer-based support mechanisms*' for assistance and response; resulting in '*an empowering way of learning that is particularly important in an information society*.'

What's more FOSS offers, promotes and *'self-regulates'* a set of rigidly accurate and generally appropriate principles and mechanisms for teamwork, quality assurance and circulation of software; *'an empowering and team-oriented way of producing products'*, primarily suitable for the *'products highly valued in a knowledge economy'*, and verified across an array of industrial spheres.

FOSS can be easily customized for local languages, consequently diminishing walls to *'access and to the mastery of skills,'* whilst assisting to eradicate the social process of becoming or being made marginal, *'of those from cultures not ordinarily possessing a high level of fluency in one of the world's major languages.'*

Levin also mentions *"that all of above benefits also help counter a psychology of dependence on developed countries and corporations to provide the innovations and solutions to problems faced domestically, even as FOSS helps reduce that dependence in practical terms."*

Also backing the cooperative and common growth of the FOSS civilization creates stability in *'bare-knuckled culture of marketplace competition in the Information and Communications Technology frameworks,'* which supports *'social'*, as well as *'economic upliftment.'*

He argues that *"participating in the FOSS community raises the profile of the developing world, helps to demonstrate its capabilities and its desirability as a progressive, technologically literate and knowledge-savvy nation, and provides a greater degree of participation in and access to the global 'quick response' teams addressing criminal cracker and virus threats. Ultimately this participation should lead to peer based relations, thus narrowing the digital divide."*

In addition, *"FOSS shifts the competitive advantage among ICT companies to value creation for the customer, removing recurring revenue streams such as licensing upgrades and ancillary software purchases (e.g., for interoperability within a proprietary*

*operating system or application suite) that benefit firms having longevity in an industry and that subsidize those existing firms to the disadvantage of SMMEs and start-ups who cannot compete on equal footing. The latter situation promotes a lock-in of economic winners in a global industry, thereby reducing market competitiveness as well as global economic transformation.”*

*Also, “the nature of open technologies can help move forward a culture of openness and transparency in government as well as society, promoting public access to government by facilitating information sharing and interoperability of ICT systems among stakeholders, and enabling government to be accountable to the people without instead being beholden to the proprietary software and standards of a private corporation.”*

### **FOSS IMPLEMENTATION**

The following examples outline selective developments of FOSS projects that have been implemented in developing nations.

*In Brazil, “Rio Grande do Sul was the first administration to pass a law making FOSS use mandatory in both government agencies and non-government-managed utilities. Four cities in Brazil have passed legislation requiring preference for "software libre" where an open-source option is available. The national health care system plans to release 10 million lines of source code. The first annual Free Software International Forum was held in Brazil in May 2000. In the province of Pernambuco, the world's first law regarding the use of open-source software was passed in March 2000.”<sup>1</sup>*

*In Bulgaria, “the United Nations Development Programme (UNDP) and the Internet Society of Bulgaria (ISOC-Bulgaria) have launched an e-government project using Free and Open Source Software (FOSS) applications aimed at helping the municipal governments in Southeastern Europe use the Internet to better respond to citizens' needs. This is the first e-government project in the region to use Free/Open Source Software (FOSS) applications to enhance government transparency and people's access to*

1. [www.pernambuco.com/tecnologia/arquivo/softlivre1.html](http://www.pernambuco.com/tecnologia/arquivo/softlivre1.html)

*municipal services. Initially launched in Bulgaria, the project will soon expand to include Bosnia and Herzegovina, Croatia, Macedonia, Romania, Serbia and Montenegro. By starting this program, UNDP hopes to show local and national governments that the involvement of citizens in the Information Society is critical for strengthening democratic governance.”<sup>2</sup>*

*In Cambodia, “the Khmer OS project aims to assist Cambodians to learn and use computers in their own language. The introduction of Khmer script in the Unicode standard allows development and support for Khmer in different platforms. This will permit FOSS adoption and localization.”<sup>3</sup>*

*In Malaysia, “the Government committed in November 2001 to using FOSS in key agencies, such as the Treasury, and in areas such as e-procurement. The Malaysian National Computer Confederation operates an FOSS special interest group. The Prime Minister launched the Komnas (Komputer Nasional) Twenty20 Personal Computer, built on FOSS by the private sector. The Malaysia Institute of Electronic Systems, the ICT advisor to the Government, is pushing the shift towards FOSS, including an attempt to build a low-cost PC based on GNU/Linux.”<sup>4</sup>*

*In Pakistan, “the Government Technology Resources Mobilization Unit has created a “Linux Force” task force that is expected to help Pakistan move toward FOSS. This would include funding for R&D programs for client software, training and local-language application development. In July 2004, a FOSS Special Interest Group (SIG) was formed by the Computer Society of Pakistan. Additionally, the Pakistan Software Export board set up the Open Source Resource Center. The Resource Center brings together the technology community and IT users to jointly explore new opportunities for FOSS deployment.”<sup>5</sup>*

2. <http://foss.isoc.bg/>

3. <http://www.khmeros.info/vision.html>

4 <http://opensource.mimos.my/>

5. <http://www.csp.org.pk/foss/>

In Peru, “Congressman Edgar Villanueva has introduced Bill 1609, “The Use of Free Software in Public Administration”, to mandate the use of FOSS in all government systems. Congressman Villanueva's open confrontation with Microsoft Peru has earned him and Peru the reputation of being the developing world's FOSS radical.”<sup>6</sup>

In the Republic of Korea, “the local company HancomLinux signed a deal in January 2003 with the country's Central Procurement Office to supply the Government with 120,000 copies of its Linux desktop office productivity software, HancomOffice. The open-source software, which is compatible with Microsoft's Office applications, including Word and Excel, is expected to save the Government money in the long run and stimulate business for local companies competing against Microsoft in the software industry.”<sup>7</sup>

In South Africa., “a government council convened to consider the use of FOSS published an official recommendation promoting the use of open-source applications when proprietary alternatives do not offer a compelling advantage, and highlighted the necessary strategic steps. In January 2003, the Government declared that it would use FOSS and set up a council for scientific and industrial research to help develop programming skills. South Africa has taken the lead in regional collaboration on OSS, including the Free and Open Source Software Foundation for Africa.”<sup>8</sup>

In Thailand, “the government-supported technology development group NECTEC has developed a GNU/Linux distribution for schools and government desktops and servers - the Linux-SIS (School Internet Server) for servers and the Linux TLE (Thai Linux Extension) for government desktops. The project aims to narrow the gap between use of pirated and legal software, and to promote local business development.”<sup>9</sup>

6. <http://odfi.org/archives/000004.html#4>

7. <http://en.hancom.com/index.html>

8. [www.oss.gov.za/](http://www.oss.gov.za/)

9. [www.nectec.or.th/linux-sis/](http://www.nectec.or.th/linux-sis/)

*In Vietnam, “government delegates to a software seminar in Hanoi concluded that Viet Nam could save hundreds of millions of dollars annually and better guarantee information security by switching to FOSS. Vietnamese IT companies are working on FOSS projects by subcontracting with foreign companies and FOSS was included in the National Program on Information Technology.”<sup>10</sup>*

10. [www.idg.com.sg/idgwww.nsf/unidlookup/21744381DA98B64148256CA80007772E?OpenDocument](http://www.idg.com.sg/idgwww.nsf/unidlookup/21744381DA98B64148256CA80007772E?OpenDocument).

## **FOSS, NGOs and CIVIL SOCIETIES**

Free and open source software (FOSS) holds a great deal of potential for NGOs and civil society organizations. The most obvious benefit of FOSS is that it is often free to use or low-cost. However, it also offers more including -crucially- better security. For example, on computers using the GNU/Linux there is no need anti-virus software. This benefits users greatly, since they don't have to spend hours or even days to recover data lost from the latest virus. Also, FOSS is based on the kind of collaborative and cooperative principles that many civil society organizations embrace.

Consequently, there are already a number of non-profit organizations in third world countries that are using free and open source software to do their day-to-day work. At present, most of these organizations are relatively technologically literate, which means that at least one of their members is experienced with free open source software. One can assume that this is a function of them being an '*early adopter* of FOSS' and is likely to change as the software and its local support resources develop.

There are, however, some challenges that one may face using open source. Some of these challenges include open source desktop applications are less common in some application categories. Many categories of software needs are yet to be supported by mature open source applications.

Some open source software packages do not have the same level of documentation, training and support resources as their common equivalents. Again, making an organization-wide switch from proprietary software can be costly. Sometimes the costs outweigh the benefits.

Many open source tools are "designed for programmers" –they are not user friendly and therefore have a heavy learning curve. There are still real costs with open source, specifically around configuration and support. Many people get caught thinking that using open source will be totally without costs.

Sharing files with proprietary applications can be difficult. This is a serious problem in the area of desktop applications such as word processing; however, this is changing. Finally, it is important to realize that as open source applications mature and the user community grows, many of these challenges may be overcome.



## **CONCLUSION**

Despite the fact that there are lots of compelling reasons for developing countries to adopt and use Free and Open source software, several problems restrict the increased usage of FOSS in these countries. Many of these problems can be solved, or at least mitigated. Developing countries should develop ICT policies that are favorable to FOSS, or at least give it an equal chance to compete against proprietary solutions.

In the not so distant future there will be an immense transformation in the software industry as more individuals demand more openness in the software they utilize. As a result, FOSS stands to gain a lot from this sentiment. Furthermore, since FOSS is reasonably priced and normally free, once many people in developing countries know of and learn to use FOSS, it will be tremendously accepted in these countries.

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## REFERENCES

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1. **Aiyer Ghosh, License fees and GDP per capita: The case for open source in developing countries**, *First Monday*, volume 8, number 12 (December 2003), [http://firstmonday.org/issues/issue8\\_12/ghosh/index.html](http://firstmonday.org/issues/issue8_12/ghosh/index.html)
2. **Constraints against the adoption and use of FOSS in developing countries** <http://business.newsforge.com/article.pl?sid=04/03/24/1744251&tid=110&tid=35&tid=3&tid=31>
3. **DiBona et al (eds) (1999) Open Sources: Voices from the Open Source Revolution**, OReilly Publishers,  [<http://www.oreilly.com/catalog/opensources/book/toc.html>](http://www.oreilly.com/catalog/opensources/book/toc.html)
4. **Free & Open Source Software** <http://www.foss.bg/>
5. **Free and Open Source Software(FOSS) e-discussion** <http://www.eldis.org/static/DOC16453.htm>
6. **Free and Open Source Software (FOSS) and Government** [http://www.iosn.net/government/foss-government-primer/foss\\_gov\\_primer\\_v0\\_2.pdf](http://www.iosn.net/government/foss-government-primer/foss_gov_primer_v0_2.pdf)
7. **Free and Open-source software (FOSS): Possible role for the UN and other international** [http://www.fossfa.net/tiki-print\\_article.php?articleId=40](http://www.fossfa.net/tiki-print_article.php?articleId=40)
8. **Free/Open Source Software, Software Technologies and Distributed Systems** [www.forumsocioinfo.gov.br/menu2/programaist/Jesus\\_Villasante.ppt](http://www.forumsocioinfo.gov.br/menu2/programaist/Jesus_Villasante.ppt)
9. **FOSS examples and adoption in countries**  [<http://r0.unctad.org/ecommerce/ecommerce\\_en/freeopen\\_en.htm>](http://r0.unctad.org/ecommerce/ecommerce_en/freeopen_en.htm)
10. **FOSS primers at International Open Source Network (IOSN) by UNDP**  [<http://www.iosn.net/foss-primers>](http://www.iosn.net/foss-primers)
11. **Information for development www.i4donline.net**  [<http://www.i4donline.net/floss/introduction.asp>](http://www.i4donline.net/floss/introduction.asp)
12. **Linux Access in State and Local Government, Part** [Ihttp://www.fourm.info/Politics/Politics\\_Item.2003-08-26.4759/view](http://www.fourm.info/Politics/Politics_Item.2003-08-26.4759/view)
13. **Niranjan Rajani et al, Free as in Education. Significance of the Free/Libre and Open Source Software for Developing Countries. Version 1.0, 2003 Rishab** <http://www.maailma.kaapeli.fi/FLOSSReport1.0.html>

**14. Promoting the adoption and use of FOSS in developing countries**

<http://business.newsforge.com/article.pl?sid=04/03/24/1751217&tid=110&tid=35&tid=3&tid=31>

**15. Policy and development implications of FOSS**

<http://www.digitalopportunity.org/article/view/99566/1/1134?PrintableVersion=enabled>

**16. Sanjiva Weerawarana & Jivaka Weeratunge (2004) *Open Source in Developing Countries*, SIDA Report.**

[http://www.sida.se/content/1/c6/02/39/55/SIDA3460en\\_Open%20SourceWEB.pdf](http://www.sida.se/content/1/c6/02/39/55/SIDA3460en_Open%20SourceWEB.pdf)

**17. The Politics of Open Source Adoption, NGO's in the Developing World  
SSRC Report by Gabriella Coleman, University of Chicago**

[http://www.tacticaltech.org/SSRC\\_Report](http://www.tacticaltech.org/SSRC_Report)  
[http://www.tacticaltech.org/SSRC\\_Report](http://www.tacticaltech.org/SSRC_Report)

**18. Williams, S. (2002) *Free as in Freedom: Richard Stallman's Crusade for Free Software*, O'Reilly Publishers**

<http://www.oreilly.com/openbook/freedom/>