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16P. Broadening The Revolution: An Assessment Of Open Source Initiatives In The Caribbean and Latin America

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Abstract
The aim of this project is to assess how different countries in Latin America and the Caribbean (LANIAC) have approached open source software adoption. Specifically, I focus on the recent open source initiatives in Brazil, Cuba, and Jamaica. I also include a brief assessment of literature on prominent approaches for open source adoption, and how different countries have approached adoption. I will highlight current limitations of open source adoption and make recommendations for where growth is possible.

Keywords
Open Source Software, Open source adoption, Migration Technology Policy, FOSS, OSS, Cuba, Brazil, Jamaica

1. Introduction
In today’s globalized world, technology has become one of the most important factors for participation in global dialogue. The plurality of participants, the volume of transactions, and the rate of information exchange have placed new demands on governments, businesses, and individuals. As it relates to nation-states, increasingly, the adoption of and access to technology can have a dramatic effect either as a catalyst or as an inhibitor for economic growth and development.

In response to these new demands, decision makers in all fields are re-examining the ways in which technology can be used to capitalize on the global "technoscape." An increasingly prevalent response has been to shift to more open technologies. Open technologies are have a greater emphasis on operability, ease of access, platform independence, royalty free or minimal cost, and openly published specifications of technology (Kaplan, 2009). Information communication and technology (ICT) environments built on open technologies generally benefit from greater efficiency, higher levels of innovation, and increased growth rates(Kaplan, 2009). One important factor in any open ecosystem is the adoption of open source software(OSS).

The Open Source Movement has fundamentally changed how many corporations and individuals approach and think about software development. Originally seen as an outcast movement with no sustainable traction, it has produced market leaders such as Apache and MySQL⁠¹. BIND and Sendmail form the Internet backbone and email transmission network

⁠¹ Apache has dominated the market for server software since the inception of systematic tracking by Netcraft in 1995. Furthermore, as of March 2004, “more than two-thirds of servers employed this or other open source products, rather than commercial alternatives from Microsoft, Sun and other firms.”(Lerner and Tirole,
respectively. Even proprietary giants such as Microsoft have been forced to adopt their own open source policies (Fitzgerald, 2006). Governments around the world continue to adopt open standards and open source preference policies, and open source companies continue to debunk the myth that the business model is not profitable. Companies like Red Hat Inc and Canonical have been definitely successful with the former trading on the S&P500 index with a revenue of $689.58M in 2009.

Within the last ten years, several governments in the Caribbean and Latin America have adopted open source migration policies or have sponsored feasibility studies on the potential of the technology’s local use. Brazilian President Lula Da Silva and Venezuelan President Hugo Chavez have both expressed concerns about proprietary software (Da Silva, 2009). Brazil, Cuba, and Venezuela have gone as far as passing legislation that mandates the use of OSS unless proprietary software is the only feasible option (Chung and Miller, 2007). Other countries, such as Chile and Jamaica, have initiated various pilot studies in fields, such as education and private enterprise, to determine where OSS is most applicable (Chung and Miller, 2007; McNaughton, 2009).

In this paper I examine how different Latin America and the Caribbean (LANIAC) countries have approached open source software adoption. More specifically, I focus on the recent open source initiatives in Brazil, Cuba, and Jamaica. Information used to construct the Cuban and Jamaican case studies was collected over a six month period (October 2009-March 2010) through published literature, email correspondence, and in-person interviews. Brazil’s adoption of FOSS has been well documented, and therefore I was able combine a number of primary and secondary sources to complete the Brazilian case-study. I also include a brief assessment of literature that investigates prominent approaches for open source adoption, and how other countries have approached adoption. Upon completing my analysis of the case studies and the literature I will make predictions on where I see OSS adoption and collaboration progressing.

2 Defining Terms
I utilize the classifications introduced by Fitzgerald (2006) to distinguish between the two current approaches to open source development. The OSS model refers to the classical or “bazaar” open source development model. OSS 2.0 refers to an emerging approach to software development and support that attempts to leverage the strengths of the open source community paradigm with the aim of providing a specific software need. Attention to the OSS 2.0 model has increased since 2000, as more governments, companies, and individuals try to utilize the strengths of the open source community development process.

2.1 OSS Development Process
OSS is the “process of systematically harnessing open development and decentralized peer review to lower costs and improve software quality” (Raymond, 2001). OSS is defined by its collaborative development, accessibility of code, and freedom of distribution. A more complete definition is available at: http://www.opensource.org/docs/osd. Open source

2 Sendmail has emerged as the “killer application” in the exchange of electronic email market. No other commercial competitor has succeeded in forming a formidable attack on its market dominance. (Bonaccorsi and Rossi, 2003)
projects may either be completely free of cost (FOSS) or persons can make them available for a small price. In the case of both options, the same principles of accessibility of code and freedom of distribution apply.\(^4\)

Classical OSS development is informal, decentralized and voluntary. Usually OSS projects start because a developer wants to solve a problem they are having, or “scratch the proverbial itch”(Raymond, 2001). The developer then releases the code to the public where other developers who have similar problems, or find the application useful, work on it ad-hoc. Software releases are frequently done but occur at the discretion of the community. There is usually not a structured direction for the project, though more mature OSS projects may implement feature requests and roadmaps for developers.

2.2 OSS 2.0 Development Process

OSS 2.0 developed out of attempts by large open source projects, companies, and foundations to focus the efforts of FOSS development along a particular path. Fundamentally, the shift to OSS 2.0 from FOSS is a movement away from the “developer itch” voluntary approach to a more focused and open collaborative effort based on a strategic plan. RedHat is one of the earliest companies that attempted to use FOSS this way. It published an architecture roadmap that detailed plans to move open source up the software stack to include middleware and management tools(Fitzgerald, 2006).

Today, almost all large open source projects utilize this type of strategic plan to develop open source development. Proprietary companies have also seen the “strategic potential of open source to alter the competitive forces at play in their industry...to grow market share or undermine competition”(Fitzgerald, 2006, pp. 8). Indeed, one of the primary motivations behind Netscape Communications’s decision to release their web browser, Netscape Navigator, as an open source project. The Mozilla project has since flourished, and its stand-alone browser client, Firefox, is now the second most popular browser on the Internet, with 24% market share.\(^5\)

3 Adoption Overview

There has been a large increase in interest in FOSS over the last ten years. Including Brazil, Cuba, and Jamaica, many other countries have begun public sector FOSS initiatives.\(^6\) These countries include China, Great Britain, India, France, Germany, South Korea, and South Africa. Countries specific to the LANIAC region include Argentina, Chile, Peru, and Venezuela(Chung and Miller, 2007). The aggressiveness and maturity of FOSS initiatives vary greatly among countries. Industry analyst firm, Gartner classified government OSS adoption policy into four categories(Chung and Miller, 2007):

The first category is the “preferential procurement policy” of OSS by excluding commercial software. Two examples of this approach are the initiatives employed by Venezuela and Peru.

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4 For an outline of various open source software licenses and the different open source business model, see (Onetti and Verma, 2009)
6 Open source projects may either be completely free of cost (FOSS) or persons can make them available for a small price. In the case of both options, the same principles of accessibility of code and freedom of distribution apply. For an outline of various open source software licenses and the different open source business model, see (Onetti and Verma, 2009)
In 2004, the Venezuelan presidential decree 3390 was issued (Chung and Miller, 2007; Samón et al., 2009). It mandated that public institutions switch from proprietary software to FOSS. Similarly, Peru introduced a bill in 2005 mandating the used of FOSS by public institutions (Chung and Miller, 2007).

The second classification is an “inclusive procurement policy”. In this category specific efforts are made to consider OSS alongside commercial options. Many governments have chosen this option for FOSS migration. Some prominent examples include the United Kingdom, India, and South Africa. South Africa has adopted a policy of preferential FOSS adoption policy in which the proprietary alternatives do not offer a great advantage (Chung and Miller, 2007).

The third strategy involves governments’ direct investment in developing and distributing FOSS. Examples of this approach include Cuba and Taiwan. In particular, the Taiwanese government launched a ‘national open source plan,’ aimed at reducing dependency on proprietary software in government and education sectors.

The fourth strategy is the process of “resource-pooling across diverse governmental agencies and authorities”. In this approach there is a strong emphasis on open standards and the reuse of open source applications to increase efficiency and maximize utilization of resources. One example is a report published by the European Commission in June 2002, which suggested the pooling of resources between different public administrations (Chung and Miller, 2007).

### 4 Case Studies

In this section, I outline the OSS adoption approaches of Brazil, Cuba, and Jamaica. Each country began FOSS adoption with very different levels of technical and economic resources, which resulted in different approaches to migration. The different case studies provide insight into how FOSS migration can be used as a stencil for adoption in any country in the region. I will first provide a brief overview of the case studies before doing an in-depth analysis of each country’s migration policy.

Brazil was one of the first countries in LANIAC to make a strong national movement towards FOSS. The Brazilian software industry is the largest in the region and one of the largest in the world. By the time the government was seriously interested in FOSS migration, several public ministries had already been investigating pilot projects and the feasibility of FOSS. Additionally, the software industry was already well-equipped with a high level of technical capital that allowed for an easier transition.

On the other hand, Cuba and Jamaica had much smaller software industries and capacities when they began considering FOSS adoption. In light of these constraints, their migration efforts required a more managed and incremental approach to FOSS adoption.

For Cuba, the socialist principles of the government meant that there has been a long history of policies that encourage agency, autonomy, and sovereignty in the people. Therefore, OSS was a natural choice when considering the limitations of proprietary software. Moreover, due to the US trade embargo against Cuba, access to proprietary software services were already limited (Trabajadores, 2009). The transition to OSS became an extension of a larger government project aimed at maintaining technological sovereignty (Menendez, 2009).
Cuba’s FOSS migration policy is based on an incremental approach. Adoption is contingent on the growth of local capacities and software projects. Interest began at the university level before it was adopted nationally. Unlike the Brazilian case, the Cuban software industry was much smaller when launched and required the development of local capacities for migration to progress.

Jamaica’s FOSS initiative is the youngest of the three included in this paper. It is unique from the other case studies’ approaches, because it is specifically focused on the application of existing FOSS as a means of improving efficiency and driving innovation, rather than the development of new software (Duggan and McNaughton, 2009). Moreover, it is the only project included that is not driven by government interest or national adoption.

The limitations of a smaller software industry, relative to its population, and the ability to scale operations were important factors in considering how Jamaica’s FOSS initiative was implemented. Despite these limitations, Jamaica’s different approach allowed for earlier FOSS deployment solutions than Brazil’s and Cuba’s initiatives.

4.1 Brazil

During the 1990s, the size of the Brazilian software industry was ranked as high as seventh in the world (Botelho et al., 2003). In 2004, the software market size in Brazil was valued at US$9 billion (Leadbeater, 2009). Moreover, between 1994 and 2000, the number of software company employees with software development-related jobs increased from 112,000 to 167,000 (Botelho et al., 2003). In 2000, the number of software development companies was estimated to be over 5,400. These figures are important because they help illustrate the strength of technical capacities that existed in the Brazilian software market when the government began the migration to FOSS in 2003.

FOSS was first introduced as an important consideration in Brazil’s national direction by the then newly elect president, Luis Inácio Lula da Silva. Within the first six months of his presidency, da Silva formed a technical committee on free software. By October of that year the Ministry of Science and Technology had allocated US$2.1 million to funding OSS (Leadbeater, 2009). In April 2004, the Brazilian government provided training for some 2,100 municipal, state, and federal public employees in the implementation and management of open source platforms for government administration.

According to Gartner’s framework, Brazil’s FOSS migration policy falls into the second category—inclusive procurement policy. Although the Brazilian government allows for the purchase and use of proprietary software, if the decision can be justified, FOSS is clearly the de facto standard (Chung and Miller, 2007).

Previous to the Brazilian government’s announcement of its intention to pursue FOSS adoption, information technology needs were entirely decentralized and each ministry chose its own systems. Conveniently, many locales and municipals had already began considering FOSS seriously. This allowed for a quick transition to FOSS. In April 2004, there were at least 5 ministries which had planed to switch many of their intranet web servers and most of their desktop computers to free software. Furthermore nearly 12 government agencies had used free software on a trial basis (Leadbeater, 2009).

Leadbeater (2009) categorizes the various motivations for Brazil’s migration to FOSS as
falling under three categories: economics, development, and ideology.

In 2003, the then head of Brazil’s National Information Technology Institute, Sérgio Amadeu de Silveira, told Wired magazine that paying royalties to foreign companies, such as Microsoft were ‘unsustainable economically’ when Linux offered a far cheaper IT solution(Kingstone, 2005; Leadbeater, 2009). He suggested that the government could save over US$120 million a year by switching to FOSS.

In 2001, Brazil’s federal government paid $1.1bn for commercial software licences. Furthermore, in 2005 for every workstation the Brazilian government purchased, it paid Microsoft a fee of around 1200 Brazilian Reais(US$500)(Kingstone, 2005; Leadbeater, 2009). These statistics are even more forceful when one considers that in 2003 figures showed that only 10% of Brazil’s 170 million people had home computers, and nine out of every ten people have never used the internet(Kingstone, 2005). Considering the additional royalties that would have to be paid to proprietary software companies, the cost closing the gap between the rich and poor within the Brazilian population would have been greatly increased by using a proprietary platform.7

The second major motivation for moving to FOSS is the impact it has on development. While the economic motivations for using FOSS could be negated or diminished with cheaper proprietary software, FOSS products have the additional benefit of having the source code of the application freely available, and also free to redistribute(open source). This allows any individual to access, modify and redistribute code. Through the adoption of FOSS locally, and also the encouragement and education of the workforce in the development and use of FOSS, skills are fostered in the workforce–both in software production and basic IT literacy–which, ultimately, boost the economy.

FOSS also provides a means to bridge the gap in technology access between the rich and the poor. The Brazilian government, through various municipalities, has been able to launch a variety of programs aimed at increasing technology access. For example, one such program is the “Recycling Goal” project, which “extends computer technology into the shanty-towns or “favelas” on the outskirts of Sao Paulo”(Kingstone, 2005). In the program old computers, from businesses or government institutions, were recycled and made available in Internet cafés or centres. This was possible because Linux, an open source operating system, supports a greater number of legacy hardware than windows, and has much lower system requirements. Also the fact that no additional software licensing costs needed to be spent to deploy the computers meant that more funds could be spent on the program itself.

The third motivation Leadbeater cites is based on ideology. On several occasions, President da Silva has spoken about how FOSS allows his nation to approach development from a perspective of self-autonomy and agency. FOSS allows the Brazilian people to build the software they want, when they want it, rather than waiting for proprietary companies to fulfill this need(da Silva, 2009). While software development could have been developed internally in a proprietary way, FOSS allows them to access a large community of resources and development support that would have been more costly to implement internally.

7 Technically, proprietary software could also be free, but utilizing FOSS has the additional benefit of being able to the software.
4.2 Cuba
Cuba’s adoption of FOSS is motivated by a variety of advantages and opportunities that are outlined in the Cuban Guide for Migration to Free Software (Samón et al., 2009). They are categorized as political, economic, and technological.

Three main political motivations are included as reasons for the support of FOSS. The first is that it allows for the removal of dependence on proprietary software companies, such as Microsoft. The use of proprietary software is seen as a potential limitation on the computerization of society. The second is that free software presents an alternative approach to software development for developing countries, that is, by definition, the “social property” of the community that develops it (Samón et al., 2009). Therefore, developing countries can create, develop and integrate software to meet requirements “quickly” and at “no cost or very little cost” (Samón et al., 2009). The third is that the underlying philosophy and development process of OSS is ideologically in line with the socialist principles of social value over profit. The economic motivations for the use of FOSS stem directly from the scalability of FOSS adoption for little or no additional cost. Due to the nature of OSS, it can be utilized in a particular environment and then employed in additional environments with minimal added cost due to software licences. Other motivations include the view that free software, developed using open standards, strengthens the national software industry by increasing and enhancing its capabilities. It facilitates the reduction of the social and technological gap between individuals, firms, and institutions in the shortest possible time and cost. Moreover, the combination of open standards and FOSS reduces the barriers to entry, allowing for greater interoperability of information systems (Samón et al., 2009; Kaplan, 2009).

The primary technical motivation for the use of FOSS is that it allows for the adoption of solutions specific to the needs of the user. Users have access to the source code and are free to change or expand the code as they see fit. As specified in open source licences, the changes themselves also remain open so that any interested individual or group can benefit (Samón et al., 2009).

Cuba’s FOSS adoption policy is a combination of strong government support, the integration of individual firms, and academia. This combination has contributed to the growth of the Cuban software industry and increases in GDP through software exports. A variety of software firms were created to meet the needs of the growing software industry in Cuba. In Gartner’s FOSS adoption scheme Cuba falls into category three—state sponsored FOSS initiatives (Chung and Miller, 2007). Despite the provision of proprietary software use, there is a strong push to have all public computers and software run on FOSS. The university plays an integral role in the growth and support of the software industry in Cuba. For example, the Universidad de las Ciencias Informáticas (UCI) was created with the goal of creating the technical capabilities needed for development.

UCI has been integrated into the Cuban FOSS adoption policy in a central way. UCI was founded in 2002, admitting 4000 students and employing over 300 teachers in the first year.

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8 See the Chapter 2.1 for an abbreviated historical development of Open Source, or (Raymond, 2001) for a more in-depth analysis.
9 In the next Chapter, OSS & Private Enterprise, I discuss more in-depth the advantages of open standards and technologies.
10 Cuba’s economy is organized using the alternative development model of Communism. One implication of this system is the government has a stake in all firms in the country. This does not prevent firm competition. Furthermore, individuals are free to have creative control over enterprise as long as they adhere to government regulations.
It has grown, now serving over 8000 degree seeking students (UCI, 2010a). The UCI website lists the following two main missions: “(1) To educate professionals committed to their homeland and highly qualified in the Computer Sciences field. (2) To produce Software and Informatics’ services from the study-work relation as the educational model” (UCI, 2010b).

Over 60% of students are incorporated into “production projects and investigative software on interest and on behalf of Cuban society and other countries in fields such as education, health, sport, online government, Free Software...” (UCI, 2010b). The incorporation of students into the development process is the cornerstone of Cuba’s philosophy on education. Mixing work and study in students’ education is one of the principles of the Cuban national hero José Martí. Novadesk, the tech support application for the official Cuban Linux distribution, Nova Linux, is run almost entirely by students. The idea behind the project is that getting students involved in the process early and exposing the problems and issues that users encounter will make them better developers in the future. This approach to education has been particularly fruitful. Many students go on to be important contributors to the Nova Linux Project or easily make the transition to employment in the growing FOSS industry.

The Nova Linux project was founded in 2005 by two student developers, Anielkis Herrera Gonzalez and Yoandy Rodriguez Martinez. After initial implementation success, the platform was incorporated into the government’s FOSS migration policy. The project seeks “to provide a product aimed at inexperienced users who have had to migrate from Microsoft Windows to [the] GNU/Linux environment or whose experience with computers is zero” (Samón et al., 2009). One long-term goal is to have Nova running on all public computers in the island (Trabajadores, 2009).

The project is relatively young, 5 years old, but it has already made substantial contributions to the general FOSS community. Nova developers also participate in and contribute to several other notable FOSS projects, including Gentoo, Sabyon, and XDL. Nova developers have also collaborated with other FOSS developers within the region like Daniel Olivera, the lead developer of the Argentinian GNU/Linux operating system.

Cuba’s government and development community have shown a strong commitment to technology sharing and collaboration. Each year, a FOSS and Information Communications and Technology (ICT) conference, called Informatica Habana, showcases various technology advancements and collaborative efforts in the technology field.

With very strict software engineering requirements, the Cuban FOSS development project is more similar to the OSS 2.0 development model, than it is to the traditional FOSS model. While early Nova development utilized the traditional open source hacker model, the national adoption of the platform has increased its importance which required greater structure and predictability. The current development process includes different validation and verification subtasks, including UML diagrams, debugging, and beta testing. Each officially supported application is developed along specific release cycles and must go through various quality assurance checks. The software quality firm, Calisoft, is one of many companies that were created to monitor the quality assurance process.

Cuba’s FOSS adoption process, though still young, is very important. It provides a model for

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11 Ututo was the first GNU/Linux operating system comprised completely of free software. The founder of the GNU Project, Richard Stallman, formerly endorsed the distribution nearly exclusively, and used in his personal machine, until he switched to gNewSense. See <http://www.gnu.org/philosophy/common-distros.html>
how a country without a large technical base can migrate to FOSS and develop a sustainable and innovative software industry. Cuba’s policy provides a model for collaboration between various industry stakeholders—within a country and across nation-states—that is the embodiment of the open source philosophy. FOSS adoption in Cuba has created linkages within the country and also across the region.

4.3 Jamaica

Of the three case studies included, Jamaica’s FOSS migration project is the youngest. Although there have been prior initiatives to explore the adoption of FOSS in Public-Sector agencies, these have been largely half-hearted efforts with minimal sustained effectiveness. The current initiative being examined, which began in 2009, presents an interesting departure from the top-heavy nationally adopted FOSS migration initiatives found in Brazil and Cuba. Those initiatives were focused on replacing all public use of proprietary software, and therefore had large software development components. In contrast, Jamaica’s FOSS initiative is led by the Centre of Excellence (CoE), a department of the Mona School of Business at the University of The West Indies, and focuses on the application of existing OSS solutions to business innovation.

The centre aims to be “the premier source of information, knowledge and expertise within Jamaica and the Caribbean, about the application of Open Source Software for business innovation” (CoE, 2010). Constrained by a modest technical resource capacity that limits feasibility of large-scale FOSS development, the initiative chose to focus on the application of existing FOSS projects rather than the development of new FOSS projects. Recognizing the importance of small-medium-enterprises (SMEs) to the growth and development of the Jamaican economy, the initiative is focused on FOSS application within this target group (CoE, 2010). Aware of the lack of research regarding the applicability of FOSS in the Jamaican context, the CoE chose to survey SME FOSS adoption as its first application and research project. This project seeks to “identify and understand the existing barriers to ICT adoption by Jamaican SMEs, as a basis for creating innovative ICT-enabled business solutions through the use of FOSS, together with managed infrastructure services, high-quality training and implementation support” (Duggan and McNaughton, 2009). Beginning in September 2009, the project includes the following as output:

1. Survey of FOSS Adoption Patterns in SMEs
2. ICT for SME’s Development & Solutions Framework: The aim of this framework is to provide a general purpose open source platform that can be utilized for both horizontal and vertical FOSS adoption.\(^\text{12}\)
3. Case Studies of ICT Application and Implementation Approaches for select SMEs
4. Virtual Open Source Lab (vOSL): The aim of the is to provide an environment that students, interested parties, and private enterprise can easily interact with different OSS configurations. It will facilitate the development of new projects, and the extension or testing of existing projects.\(^\text{13}\)

\(^\text{12}\) Horizontal adoption refers to the application of closely related software, or software within the same category. An example would be a FOSS web server which usually includes the Linux operating system, Apache web server, MySQL database and PHP or Python programming languages (LAMP). A vertical adoption platform refers to the building or combination of software solutions, not necessarily related, to add new value. An example of this would be launching a Human Resource Management system on the LAMP server.

\(^\text{13}\) See “About CoOL Open Source Lab” for more details <http://coe-msb.org/cool> accessed March 13th, 2010
As of February 2009, the survey of FOSS adoption patterns among SMEs is complete. There were over 65 respondents and findings will be published soon. Additionally, the Centre recently began a FOSS adoption pilot project based around a specific group of FOSS applications with select SMEs. The advantage of focusing on a specific group of applications, also known as a software stack, allows the CoE to build up a body of resources and practices in a short period of time that can be reused by many SMEs. In the following Chapter, OSS & Private Enterprise, I discuss the benefits of FOSS adoption for SMEs and also present more findings from the CoE case study.

5 Opportunities/Future Work

Free and Open source software presents many unique opportunities for governments around the world, and specifically those in the Caribbean and Latin America. Not only does it provide a means to fulfilling various software needs, but it provides a means to increasing agency in populations. Many governments have expressed technology sovereignty and independence as an important factor for adopting FOSS. FOSS also has the potential to be a driving force of economic growth and development. It provides a low cost solution to decreasing the technology gap between the rich and poor. Furthermore, there is extended research to support the employment of open standards as a means to increasing innovation and efficiency. These two economic factors, low cost and increased innovation and efficiency, are compelling arguments for FOSS adoption in developing countries that generally suffer from high levels of indebtedness and low levels of growth.

The last ten years of FOSS migration have been characterized by localized software development and implementations, with modest levels of cooperation across countries. I anticipate that the next phase of FOSS migration within the region will feature increased cooperation across nations. Recent collaborative projects between Venezuela and China, and between Argentina and Cuba developers support this claim. As more countries see the benefit of FOSS adoption and development, there will be a greater pool of open source software available that solves problems often shared by multiple countries. Instead of countries starting new or domestic FOSS projects, collaboration between countries will become a more attractive option.

Additionally, countries with limited resources may choose to collaborate so as to produce software faster. This minimizes the time required for countries to benefit from FOSS usage, as they invest in local capacities. Cross country ventures and information sharing will be particularly beneficial for small countries, such as Jamaica. The Open Source movement is very young in the Latin American and Caribbean regions, and the literature would imply that the revolution has a bright future.

References

Jae Eun Chung and Jade Miller (2007) “Open source software policy and the mnc: The case

of Brazil”. In IAMCR 50th Conference Proceedings. International Association for Media and Communication Research.


Maurice McNaughton (2009) “Project charter: Enabling the adoption and diffusion of free and open source software among smes in jamaica”.

Evan Duggan and Maurice McNaughton (2009) “Free and open source software grant proposal”.


