



**Government of the Republic of Trinidad and Tobago**  
National Information and Communications Technology Centre

**DRAFT Open Source Software (OSS) and the  
Government of Trinidad and Tobago**

A Position Paper

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Position Paper on Open Source Software (OSS) in GoRTT

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## 1 Document Name

Position Paper on Open Source Software and the Government of Trinidad and Tobago

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## 2 Target Audience

This document is intended for GoRTT I.T Strategists, in the process of developing key ICT infrastructure, architecture and developmental programmes for Trinidad and Tobago.

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## 3 Executive Summary

The Government of the Republic of Trinidad and Tobago (GoRTT) and Governments across the world are finding innovative ways to reduce spending, while working towards improving service delivery to its citizens. GoRTT is also seeking to achieve urgent transformation and reform in Government organizations - a practice that often requires improved business processes, new information systems and data infrastructures. In information systems and data management the opportunity to acquire new systems with tight budgets or to make operational savings for established systems are limited.

A major benefit to GoRTT in exploring open source software is the potential to directly benefit from lower software costs, while indirectly benefiting from greater adherence to open standards, more diversified options of Vendors/Service Suppliers, and flexible ICT architectures. Similar initiatives are reflected by the ambitions of many developing countries which can indicate realized benefits which can be advantageous to GoRTT.

GoRTT will appreciate greater flexibility, openness, ability to customize, and improve support for open standards with a wider adoption of open source software. Altogether a more open and accessible software environment, a comprehensive vision is where the enduring benefits and associated cost reductions will be achieved. The following are some considerations that GoRTT should take into account for open source adoption:

- Open source can bring a number of distinct and enduring benefits when contrasted to proprietary software, and many of these are directly financial.
- Practicality needs to guide open source adoption and not philosophy. This pragmatism is reflected in the need for a strategy and a plan to work towards open source options. It is not a quick fix, low hanging fruit or an easy win-win scenario.
- Migrating to open source is more likely to be successful if it is done when there is a real and present need for change or a new approach, rather than simply on the basis of finding open source attractive on infrastructure cost arguments.

- Adoption of open source can be part of building a more agile organisation able to innovate and respond to change. It can also be part of (re)building in-house expertise and regaining control.
- Success with open source software requires that all key stakeholders within GoRTT Ministries and Agencies understand the potential and the obstacles, and provide sustained leadership. Their role is to support and promote an appropriate regime for software acquisition but also to endorse a shift in thinking or new vision for the wider systems strategy.

This paper provides an overview of open source software and the possibilities it can bring as one of several ICTs initiatives within GoRTT. This paper herein discusses relevant opportunities to further the National ICT sector, in developing an action plan for incorporating Open Source Software in computerized environments of GoRTT. Adoption and development of open source can support the sharing of both expertise and expense between government agencies.

GoRTT agencies that have a requirement to explore open source software, requires strong champions, wide commitment, planning and execution. Open Source, once strategically executed, can serve as a flexible route to collaboration and human capital development within GoRTT.

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## 4 Aims and Objectives

The aim of this paper is to provide some insight into what is Open Source Software and the possibilities it can bring as one of several ICTs in Government. The positions discussed herein shall be critical to further engage the National ICT sector, in developing an action plan for incorporating Open Source Software in computerized environments of Trinidad and Tobago.

In pursuing the above aims, this position paper attempts to;

- (i) address the major risks cited against the use of Open Source Software,
- (ii) identify the use of Open Source Software in various segments of the industry,
- (iii) Propose a way forward, with opportunities and threats, for the use of Open Source Software in Trinidad and Tobago.

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## 5 Context

This Paper on the use of Open Source Software in GoRTT shall be consistent with the general framework of goals, objectives and action plans of the National ICT strategy.

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## 6 Introduction

The Internet started in 1969 with open standards such as Requests for Comments (RFCs) and in 1998 the term open source became a label to refer to software. So, what is Open Source Software?

Open Source Software is any software/program that provides users with:

- Access to its source code whether in source code form or compiled form, for viewing, distribution and or modification, free of charge. Modification though may be restricted and the license of the code would define how the code can be modified;
- The ability to download, install and use the software/program in any field of choice. Even for studying/educational purposes; and
- The ability to improve upon the software/program through versioning or carrying a totally different name. This however, is driven by the license for the software/program.

There are various licenses for Open Source Software many of which the Free Software Foundation (FSF) holds the copyrights. These licenses include:

1. GPL – Compatible Free Software Licenses;
2. GPL – Incompatible Free Software Licenses;
3. Non-Free Software Licenses;
4. GNU General Public License (GPL);
5. GNU Lesser General Public License (LGPL);
6. GNU Affero General Public License (AGPL); and
7. GNU Free Documentation License (FDL).

Open Source Software is also classified based on fundamental standards:

- whether they are **free** software;
- copyleft;
- compatible with the GNU GPL; and
- whether they cause any particular problem(s).

**Free Software** - Software that is classified as **free** means the source code must be available and:

1. Users are not required to ask for permission or pay, to run the program for any specific purpose;
2. Users have the liberty to study how the program works and can alter it / them to perform in any way suitable to them;
3. Users are allowed to redistribute copies of the original program freely; and
4. Users are allowed to produce modified versions if so desired. These modified versions, however, must also be free but the possibility of charging a distribution fee should be attainable. So the charge applied is solely for distribution (i.e. delivery and media such a CDs, etc.) not the program itself.

One major inherent benefit of free software is that the software is geared towards the user's purpose not the developer's purpose and users are not authorized to force their objectives on others.

**Copyleft Software** - Software classified as *copyleft* means any program that is redistributed with or without changes must guarantee that all modifications and extended versions of the program be free as well. This method was developed to guarantee that all users have freedom to programs, their modified versions and/or extended versions and to prevent anyone from becoming a middleman by converting programs to proprietary software and depriving others from freely accessing the programs.

**GNU GPL Compatible Software** - Software that is classified as compatible with the GNU GPL means the code within the software can be combined with code released under the GNU GPL to produce a larger program. This also holds true for distributions of the program once the combined code is released under the same GNU GPL version.

As a result of the above standards, licenses and freedom in the "Open Source world" creativity thrives and has led to a vast number of openly available and widely used software/programs across the globe. At the consumer level these developments have impacted everyday life and can be seen in the lives of individuals, who are accustomed to the proprietary Microsoft Windows environment. Programs such as Mozilla's Firefox (web browser), Pidgin (instant messenger) and OpenOffice.org (Office suite) are but a few examples of free Open Source Software that are being used to communicate with and in the "Windows world" today.

On a corporate level Open Source Software has been and continues to be a topic of interest to many organizations. Organizations have begun using and incorporating open source software into their business processes. However the nature of the Open Source world forces companies to ask certain fundamental questions such as; will it really provide cost savings? How secure is it? What if we invest in a particular program or package and it reaches end of life? What about support? Answers to these questions are wide and varying depending on the Open Source software that is being used. Thus, the use of Open Source Software most often cannot simply be generalized and must be explored on a case by case basis. Organizations must explore the specific software and whether it will be a benefit or a burden to conducting their business. This paper will attempt to show why the Government of the Republic of Trinidad and Tobago should be exploring the feasibility of incorporating the use of Open Source Software and to what extent.

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## 7 Why Not Open Source Software

While there are many benefits to using Open Source Software there are also two major concerns associated with it. As described above these concerns cannot be generalized and need to be analyzed on a case by case basis for each potential open source solution. That being said, these concerns, while valid and should be at the fore-front and should not prevent the Government from exploring the use of Open Source Software to determine how it can enhance and improve the way it conducts business.

### 7.1 Data and Security

Security is a major concern with regard to the data of any organization. This is one of the main areas of contention when businesses hear the words Open Source Software. There is an ongoing debate on whether open source software increases software security or is detrimental to its security. There are a variety of different benefits and drawbacks for both sides of the argument. There are also a variety of metrics and models to measure the effectiveness of the security. Many large proprietary software companies strongly condemn the adoption of Open Source Software from the stand point of security threats because, as champions of the proprietary software model, they argue that:

- Having the source code accessible by anyone, makes it more vulnerable to malicious activity such as hacking. Hackers can easily find and use unpatched vulnerabilities;
- Having the source code is open for review and changes by the public does not ensure that the public will review and patch specific vulnerabilities in the code; and
- Having the source code available often generates a false sense of security as consumers can be led to believe that many people are reviewing the code when this is not necessarily the fact.

From an Open Source perspective:

- Since the source code is freely available and is shared by a wide community then it can be deemed more stable and secure than proprietary software because more developers are involved in refining the source code to suit a larger community of users;
- Consumers are allowed to make changes to the code thus they can find vulnerabilities and apply patches as necessary. Users of proprietary software must await the vendor to supply a patch at their specific intervals; and
- Source code for program compilers are available thus allowing consumers to make changes to even the compilation and prevent hacks such as the Thompson Hack (which attacks the compiler).

With a good open source software development, the result is often a collaborated effort that produces software that has very few, if any, errors/bugs/vulnerabilities hence it is used in a wider range of diversified businesses around the world. With proprietary software one must question, is it really more secure than Open Source Software since the source code of proprietary software cannot be examined? Its security cannot truly be assessed and the uncertainty of the level of protection



consequently increasing one's risk. An example of this is to consider the number of security flaws being constantly uncovered in Microsoft's software programs which are proprietary in nature. The underlying principle is that security through obscurity can, and often does, lead to sloppy practices and weak security. Also most of the reliable systems and powerful security analysis tools used by the Information Security Sector are Open Source Software.

## 7.2 Support

Support is another major issue for the Open Source world. Developers are a community that typically makes no profit on their programs. These programs are made freely accessible to the general public. If there is an issue or flaw in the program it is up to the community of developers to fix the issue. It would also be an issue for users attempting to install and use open source software as there are typically no detailed user manuals generated by the community and support for configuration of the software may be only forum based.

Advocates of proprietary software also claim that Open Source Software is not truly free and actually will cost governments / corporate bodies more in training and support. This is because:

- Open source software is less mainstream and more often than not the learning curve is higher than proprietary software as companies have more time and resources to spend behind user interface design (open source software is also typically aimed at the more tech savvy individuals); and
- Open source software is community based and thus companies would spend more time on finding solutions to issues whereas in the proprietary software world most companies provide multi-tiered support including over the phone support.

These issues, while valid, should not be generalized to all open source software. Depending on the software being used, some companies offer support contracts to support open source software. They will provide tiered support just as proprietary software vendors. This leaves all the benefits of open source software intact without sacrificing support.

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## 8 Why GoRTT Should Incorporate Open Source Software

In any major organization, proprietary software simply cannot be replaced. Proprietary software provides specific elements that may not be able to be filled by open source software. However, as open source software gains traction and acceptance it finds its way into major organizations supplementing proprietary software, cutting costs and fulfilling niche needs that proprietary software may overlook or not address entirely.

A healthy train of thought for any organization would be to explore its' needs and analyze the viability of open source software to either supplement or replace certain pieces of proprietary software.

GoRTT has an Enterprise Agreement with Microsoft the owner of the proprietary Windows Operating System (OS) and associated software. This agreement entails an enterprise / volume license that allows GoRTT to install, run and use these proprietary products throughout the various ministries and government agencies of Trinidad and Tobago as well as have access to product support any day, any time. It is a very expensive venture that is renewed every three years. Although at a glance one might say it is a complete package, a one stop shop or the go to place for a company's business software needs, it causes vendor lock in and one has to seriously consider if he or she is getting value for money.

Is investing heavily in proprietary software and support really addressing all the business software needs? Is it enabling interoperability among all the systems of the business and facilitating easy collaboration with data exchange? What about mixed environments? For example, a business using Microsoft Office 2003 and Microsoft Office 2010 because it is unable to afford upgrading every desktop user due to financial constraints. More importantly, is every program within the office suite being used by everyone? What happens if the vendor of the proprietary software goes out of business? Will this result in an abrupt end in customer support? These are just some of the issues that can be altered by the introduction of Open Source Software into GoRTT's ministries and government agencies.

Its appeal is not just that it is cheaper, more versatile, reliable and customizable software. Open source software represents a structural shift of power from sellers to users, and in that sense is one of the most liberating tools of media empowerment that individual citizens and the civic sector might ever imagine.

Apache, Perl and many other open code software programs are being embraced by major proprietary vendors as cornerstones for future software development. Even Microsoft concedes in internal strategic analyses leaked to Eric Raymond -- the "Halloween Memos" -- that GNU/ Linux and other open code software;

*"Provide very dramatic evidence....that commercial quality can be achieved/exceeded by open source software projects. "*

All of this suggests that the new software movement stands at a new threshold.

Open source software has become such a phenomena now that numerous governing bodies including the United States Department of Defense, China, Germany, France, Finland, the Philippines, Peru, South Korea, and Taiwan are all considering or already have embraced Open Source Software. It is time for the Republic of Trinidad and Tobago to head in this direction as Open Source Software confers a promise of better software

and independence from monopolistic behaviors and such promise and effects has far reaching consequences when it comes to employment and opportunity.

GoRTT, like other countries, consists of multiple ministries and organizations, most of which create and maintain their own internal ICT environments and separate unique deployment of applications and services. These systems often perform similar tasks, such as providing email or web hosting and are generally used at a fraction of their capability. Components such as email and word processing currently come as part of the Microsoft Office suite which contains other programs that aren't consumed by many users in GoRTT. Although GoRTT has an enterprise license the full benefit or value for money is not realized.

Below are three articles which highlight the fact that countries are adopting the use of Open Source Software and that it is becoming the foundation for the future:

- 1) Microsoft's decision to not enforce patents on Web services standards underscores the growing acceptance of core open-source tenets.

*The software giant published the Microsoft Open Specification Promise, a document that says that Microsoft will not sue anyone who creates software based on Web services technology, a set of standardized communication protocols designed by Microsoft and other vendors.*

*Reaction to the surprise news was favorable, even from some of Microsoft's rivals.*

*"The best thing about this is the fundamental mind shift at Microsoft. A couple of years ago, this would have been unthinkable. Now it is real. This is really a major change in the way Microsoft deals with the open-source community," said Gerald Beuchelt, a Web services architect working in the Business Alliances Group in Sun Microsystems' chief technologist's office.*

*Microsoft has never sued anyone for patent infringement related to Web services. But its pledge not to assert the patents alleviates lingering concerns among developers who feared potential legal action if they incorporate Web services into their code, said analysts and software company executives.*

*Open-source developers, for example, should have fewer worries about writing open-source Web services products. Also, other software companies could create non-Windows products that interoperate with Microsoft code via Web services.*

*The move reflects how Microsoft has had to come to terms with open-source products and development models.*

*When Linux began to take hold in the late 1990s, company executives seemed shaken by the shared code foundations of the open-source model. CEO Steve Ballmer famously called Linux a "cancer," while founder Bill Gates derided the "Pacman-like" nature of open-source licensing models.*

*Other Microsoft executives, such as Windows development leader Jim Allchin, have in years past painted open source as "an intellectual property destroyer."*

*But in the past two years, Microsoft has stepped up its Shared Source program, in which it gives free access to source code under terms similar to those in popular open-source licenses. It has also said it will make Windows-based products work better with those from other vendors, including Linux and other open-source software.*

- 2) An example of going the way of Open Source Software - The European Commission. In an article dated 26 March 2008:

*The European Commission announced it would increase its own use of open source software for ICT projects: "For all new development, where deployment and usage is foreseen by parties outside of the Commission Infrastructure, Open Source Software will be the preferred development and deployment platform."*

*Valerie Rampie, spokesperson of Siim Kallas, the European commissioner on administrative affairs, declared for the IDABC open source observatory that the publication of the strategy is made "mainly for information purposes".*

*The new strategy paper of the Commission, that has been a supporter of open source software since 2000, explains that open-source software should be pursued provided it does not cost more and is in the best interest of European citizens.*

*The Commission decided that "for all future IT developments and procurement procedures, the Commission shall promote the use of products that support open, well-documented standards. Interoperability is a critical issue for the Commission, and usage of well-established open standards is a key factor to achieve and endorse it."*

*According to the Bloomberg News, the decision could be seen as a potential setback for Microsoft that "is trying to prevent an increasing number of defections by governments from its proprietary software toward software from open-source developers, who are allowed to modify the software source code, or underlying instructions."*

*But the open-source developers are more than happy with the result: "There is a growing pressure on the commission to promote open-source software," explained Carlo Piana, a lawyer for the Free Software Foundation Europe (FSFE)*

- 3) Below is an article dated 16 June 2010 from the Digital Agenda Commissioner Kroes Publicly Supporting Open Standards:

*On 10 June 2010, European Commission Vice-President for the Digital Agenda Neelie Kroes addressed the Open Forum Europe 2010 Summit on interoperability and open standards, stating she was planning to overhaul the European Interoperability Framework to make ICT standard-setting more transparent and make sure public administrations use open source formats to prevent the development of monopolies in the sector.*

*Kroes has been supporting interoperability and open standards for some time now and she emphasized again her belief that choosing open standards is a very smart business decision.*

*She reminded she had proposed five actions in the Digital Agenda for Europe in order to "have more and better standards recognized and created in Europe, to make better use of these standards and to improve interoperability in the absence of standards."*

*The new framework that will be developed would include a requirement for standard-setting bodies, such as World Wide Web Consortium and Oasis, to have disclosure rules in order to make it easier for others to use and adapt the technology.*

*The Commissioner believes appropriate rules for ex-ante disclosures of essential Intellectual Property Rights and licensing conditions in standard-setting contexts must be promoted. Transparency of the process is absolutely necessary. "In some cases, the choice of a technology in a standard might be obvious in the absence of technical alternatives. Costs and licensing conditions are less relevant in such cases. But in most cases there are competing options and it makes clear sense to also consider this information."*

*She criticised the authorities that get stuck into proprietary technology for a long time. "This is a waste of public money that most public bodies can no longer afford.*

*Moreover, she also warned that anti-trust litigation was not how she planned to increase interoperability in the market. She expressed her intention to explore "all options to ensure that significant market players cannot just choose to deny interoperability with their product. You no doubt remember that I have some experience with reticent high-tech companies: I had to fight hard and for several years until Microsoft began to license missing interoperability information. Complex anti-trust investigations followed by court proceedings are perhaps not the only way to increase interoperability.*

*This position comes in line with the EU telecoms ministers April declaration to support the freely-available Open Document Format in e-Government services.*

#### **4) F/OSS Adoption in Brazil: The Growth of a National Strategy**

*When Luis Inacio Lula da Silva became president of Brazil in 2003, industrialized nations looked on with some trepidation. The former union organizer was Brazil's first left-wing leader in 40 years, and many in the international business community wondered how his politics would affect the country's large, but precarious economy. Brazil boasted the world's 15th*

largest economy with a GDP of \$493 billion, but its GDP per capita was \$7,900, 94th in the world. Its national debt was \$250 billion. Forty percent of all workers were paid less than minimum wage (\$223.26 per month), and less than two percent made more than \$1,489 per month. Only 10 percent of its 170 million citizens owned computers.

Lula assuaged some of the financial concerns over his leftist leanings by practicing fiscal discipline, cutting federal spending even at the expense of some traditional left-wing programs. In keeping with this policy, he announced in late 2003 that the federal government would look to migrate to free and open source software (F/OSS) on a broad scale. On the surface, this decision was a simple cost cutting measure. According to Brazil's Instituto Nacional de Tecnologia (INT), Brazilians spent \$1.1 billion every year on software licensing fees, and the federal government was the nation's biggest customer. While the average computer cost R\$1,200; the cost of Microsoft Windows and Office was R\$2,000. The government accounted for six percent of Microsoft's 2003 Brazilian revenues of \$318 million. Switching to F/OSS would save millions of dollars.

The decision was bold and controversial. Open source software had long fought the stigma of being less polished than its proprietary counterpart. Although open source software had matured considerably and corporate adoption had grown steadily over the previous decade, Brazilian versions of these tools were still in their infancy. Additionally, the model of open source software development was (and is) still not widely understood. Entrusting a country's IT infrastructure to a decentralized process that lacked an obvious sustainability model required tremendous faith in emergence and the grassroots. The decision to migrate to open source software on a national scale was not simply a matter of choosing one product over another. It was a political decision that validated open source software as a movement.

What were the circumstances that led to this decision? The desire to cut costs was the most obvious, but not the sole motivation. In many ways, open source was the technological parallel to the grassroots political movement that had thrust Lula into his country's top office. It was a way to make technology more accessible to the people at large, and as such could help close the digital divide and improve living conditions for Brazil's many poor workers.

At the end of the paper it stated that in Brazil, in October 2004, the government announced that it had spent R\$768,000 on open source software, a savings of R\$24 million over the equivalent proprietary licenses from the previous year. The government also announced that 68% of federal organizations had begun exploring open source adoption in some form. Programs of grants and tax abatements have also been developed to encourage nation-wide adoption of open source, not just within government agencies but also in the private sector. These efforts helped forge an important alliance with SOFTEX, the main representative of the Brazilian software industry, which announced its support for the government's F/OSS initiative. Mario Girao, president of SOFTEX, got on board by stating that F/OSS was the best way for Brazilian software companies to compete with foreign companies like Microsoft. By October 2004, mid-sized and large companies had invested 38.5% of their total IT budgets on open source solutions, and 78% of Brazil's largest companies had adopted at least one open source solution. The government's new policy also drew support from IBM, which pledged \$1 million to help build a new center in Brazil (CDTC) for promoting and developing open source software.



## 8.1 OSS and Market Share

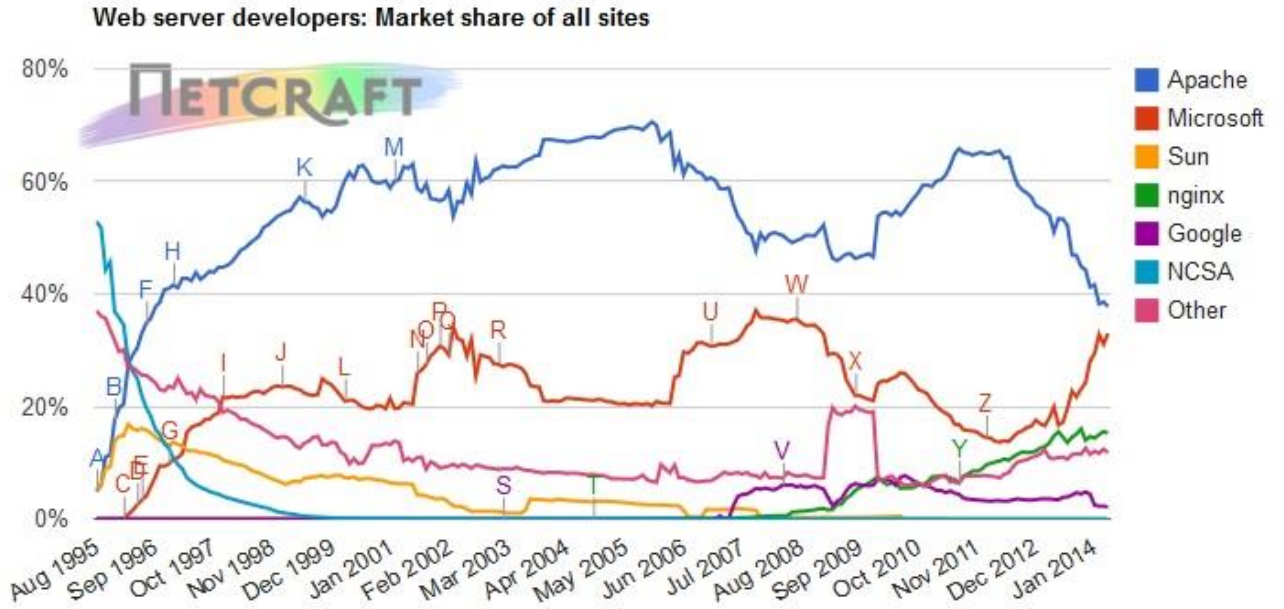
Many people think that a product is only a winner if it has significant market share. This is lemming-like, but there's some rationale for this: products with big market shares get applications, trained users, and momentum that reduces future risk. Some writers argue against OSS or GNU/Linux as "not being main stream", but if their use is widespread then such statements reflect the past, not the present. There's excellent evidence that OSS has significant market share in numerous markets:

The most popular web server has always been OSS since such data have been collected.

For example, Apache is the #1 web server with over three times the market share of its next-ranked competitor. The #2 web server is nginx which is also a free and open source web server. Netcraft's statistical web servers have consistently shown Apache (an OSS web server) dominating the public Internet web server market since Apache first rose to the #1 web server in April 1996.

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Market Share for Top Servers across All Domains  
June 2000 – April 2014



Developer	March 2014	Percent	April 2014	Percent	Change
Apache	354,956,660	38.60%	361,853,003	37.74%	-0.87
Microsoft	286,014,566	31.10%	316,843,695	33.04%	1.94
nginx	143,095,181	15.56%	146,204,067	15.25%	-0.31
Google	20,960,422	2.28%	20,983,310	2.19%	-0.09

Before that time, the NCSA web server (Apache’s ancestor) dominated the web from August 1995 through March 1996 - and it is also FOSS.

Netcraft’s survey published April 2014 polled all the web sites they could find and found that of all the sites they could find, counting by name, Apache had 38.60% of the market, Microsoft had 31.10%, nginx had 15.56%, and Google had 2.28% (these were the top four).

However, many web sites have been created that are simply “placeholder” sites (i.e., their domain names have been reserved but they are not being used); such sites are termed “inactive.” Thus, since 2000, Netcraft has been separately counting active web sites. Netcraft’s count of only the



active sites is arguably a more relevant figure than counting all web sites, since the count of active sites shows the web server selected by those who choose to actually develop a web site. Apache does extremely well when counting active sites; in their study published in April 2014, Apache had 52.18% of the web server market, nginx had 14.19%, Microsoft had 11.37% and Google had 8.33% Here is the total market share (by number of active web sites):



Developer	March 2014	Percent	April 2014	Percent	Change
Apache	93,759,928	52.18%	95,512,314	52.44%	0.26
nginx	25,497,586	14.19%	25,900,525	14.22%	0.03
Microsoft	20,436,280	11.37%	20,175,151	11.08%	-0.30
Google	14,967,579	8.33%	14,829,924	8.14%	-0.19

## 8.2 The Significant Benefits of Open Source Software

We have spoken about disadvantages of open source software, shown that governments and organizations worldwide have adopted it and even spoke about its use in terms of market share. Now let us take a look at some of the significant benefits that OSS can provide to GoRTT.

With the introduction of Open Source Software (OSS) GoRTT can explore several options but these should be guided in part by analysis of the present environment. Benefits to be realized include:

- having an alternative to proprietary software which carry expensive licenses for a contracted period of time
- reduced investments in proprietary licenses
- better synergies and collaboration among the variety of systems that exist throughout the ministries and government agencies
- better utilization of software programs and packages
- being an exemplar in balancing investment with software usage throughout government
- no vendor lock in, therefore no monopoly pricing
- IT Managers will not have to plan their IT strategy around a vendor's cash needs
- Security against vendors choosing to stop providing support for software that may be fundamental to some of GoRTT's business operations.
- possibilities of creating employment for citizens with specialized skills in areas such as programming and software development
- provide opportunities for programmers to have authority but not ownership over important functions that are more often than not, usually contracted out to overseas consultants
- being open to interoperability on a larger scale
- reduced administrative overhead because there may not be a need to account for the number of copies of a program or suite in use,
- very little to possibly no downtime due to fewer updates required for the software programs
- significant contribution to the education system

Open Source Software is here to stay in both the public and private sectors around the world. It continues to evolve and in some cases through derivatives present variations to some software like GNU/Linux, Fedora, Mozilla, Google and Redhat to name a few. Although it is not widespread at this time in government, it still exists which proves it to be useful and possibly appropriate for everyday operations. Hence there is a need to explore the full potential it can have on providing suitable systems that can be consumed by government's computing needs and by extension have a positive impact on the economy.

If ministries are able to use Open Source Software to run their user desktops and laptops together with associated free applications, GoRTT can significantly reduce their expenditure on proprietary software. This is a classic example where free Open Source Software can be applied to reduce cost of purchasing enterprise licenses and provide GoRTT with a more practical Return On Investment (ROI). Like the private sector, GoRTT will be able to enjoy the benefit of making better use of software and resources.

By exploring the world of Open Source Software, GoRTT can experience the same opportunities the rest of the world enjoys and at the same time bring the twin island state one step closer to first world countries technology drive and utilization. It will also put GoRTT on the map as a leader in the Caribbean for embracing and being adaptable to ICTs in this ever changing world. Adopting the use of Open Source Software, allows GoRTT to retain some expenditure within the country thus reducing foreign investment in programmers, software developers and consultants. This will encourage growth

and development locally and ensure our citizenry comprise of highly skilled people who can then become consultants / advisors to neighboring Caribbean islands and possibly other parts of the world.

### ***8.3 How Open Source Software Benefits Developing Countries***

One of the biggest selling points of Open Source Software is that it is free to download, install and run without being locked into a contract. If you don't like what you downloaded or realize the software does not really match the needs of your business, you can simply stop, uninstall it and look for other software that better meets your needs. In developing countries this is of great benefit because these countries are often not in the same financial position as the first world countries and not having to invest wholly and solely on proprietary software gives these countries the opportunity to participate in the ICT world with low budgets. It also provides an ideal prospect for these countries to learn about software and how they work without having to invest heavily in training unlike working with proprietary software. Open Source Software sort of levels the playing field for small organizations, in this case, governments in developing countries, to compete with bigger ones in terms of ICT infrastructure and resources.

Although the following point is applicable to business users in general, for developing countries it can be seen as an advantage because these countries are basically building from "ground up" unlike other countries that have already invested largely in proprietary software and are considering switching or including open source software in their environments. Developing countries through the use of open source software can obtain long-term flexibility by using open standards at the core of their infrastructures for internetworking and data exchange. This will help in preventing vendor lock-in and at the same time facilitate better communication among various ministries software systems.

#### **Examples of Direct Involvement**

Since Governments are important consumers of ICT in developing countries, their participation is crucial for the success of any open-source initiative. Government can be involved at the level of strategic policy, building awareness and promoting conscious and informed choice among its administration as well as industries and civil society. It may act as a procurer, and it may directly finance R&D. This section considers different levels at which Governments can implement a FOSS strategy. A good example of high-level strategic thinking is the case of the Government of South Africa. A council to consider the use of FOSS was convened in early 2003. The council delivered an official recommendation promoting the use of open-source applications when proprietary alternatives did not offer a compelling advantage. The recommendations were formulated at a strategic level. A strategic approach would allow Governments to work in collaboration with donors to map out potential areas for development assistance, in particular identifying potential human resource capacity-building and technical assistance needs. The report recommends creating strong linkages with higher education institutions to build a national collaborative network that can be extended internationally. It also emphasizes building partnerships within the public and private sectors and civil society, as well as regionally within Africa and globally. The strategy emphasizes the importance of building support among key stakeholders, including the political level, senior management, IT professionals and government users.

Still at the strategic level but with the stakes raised to international collaboration, FOSS may have the potential to generate large economies of scale and positive spillover effects in regional capacity building and infrastructure development. A number of regions have taken steps toward collaborating on FOSS, and such cooperation has been most pronounced in Africa. In early 2003, African countries from across the continent launched the Free and Open Source Software Foundation for Africa (FOSSFA), an organization aimed at promoting the use of FOSS throughout the continent. In the regional context, Brazil has become, and continues to strengthen its position, as a leader due to the strategic use of Open Source software and an innovation system which encourages direct collaboration between higher education and industry.

On October 10, 2002, the Danish Board of Technology released a report about the economic potential in using Open Source software in the public administration. The report showed a potential savings of 3.7 billion Danish Kroners (500 million Euros) over four years. A pilot project in the Hanstholm municipality determined that switching the office suite from Microsoft Office to OpenOffice.org and StarOffice did not increase their number of problems and that each user only needed 1 to 1.5 hours of training to learn the new office suite. The municipality will now use OpenOffice.org and StarOffice on all workplaces (200 in all) and will save 300,000 Danish Kroners (about 40,000 Euros) each year in license fees. They will still use Microsoft Windows as their OS.

On the other hand, the French industry news service Toolinux reports that the French police are planning to switch from Microsoft Office to OpenOffice. By the end of January some 35,000 PCs and workstations were to be equipped with the open source office suite; by this summer the number is to reach 80,000. The French police expect to be able to cut costs amounting to more than two million euros by this move.

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## 9 Conclusion

Open Source Software in its own right is a standard among many people in today's world. As businesses continue to look at ways of cutting costs, maximizing their profits and ensuring all their ICT resources are fully employed, not only does Open Source Software continue to lead the way in areas such as web servers and database servers but also is becoming more recognized in the desktop and laptop environments where consumers have the option of choosing an Open Source Software as their preferred Operating System (OS) of choice. In terms of subscribing to support for Open Source Software, this may not be as much of a concern as might be expected. The open collaboration that is the foundation of Free Open Source Software, more often than not, causes software to be produced that is sound in coding as the input is vast and wide involving people from all walks of life. So interoperability, performance and stability are qualities that would surely be present in the development of Open Source Software that adhere to the GNU licenses.

As the Government of the Republic of Trinidad and Tobago continues on its quest to explore the various ways ICTs can have a positive effect, it is recommended that the use of Open Source Software be included where possible to gain a better ROI on technology.

In adopting Open Source Software, GoRTT needs to conduct a feasibility study where:

- The types of software used within government are to be identified
- Where programs make up packages/suites, how many of the programs within these packages/suites are being used (e.g. Microsoft Office suite where MS Word, MS Excel and MS Outlook may be the most frequently used in one environment, MS PowerPoint, MS Publisher and MS Outlook in another)
- The number of users who utilize these programs for their day to day functions and the frequency with which they are used
- Mission critical programs need to be highlighted
- Locate Open Source equivalents to the proprietary software where possible
- Identify the available support whether forum/community based or subscription based
- Conduct a cost benefit analysis in the various areas and ministries

The bottom line is, open source software has evolved beyond the stigma of being unpolished pieces of software that require a tech-savvy individual to use. OSS has grown and continues to grow into applications that can supplement and in some cases even replace proprietary software. Security and Support for OSS remain valid concerns but cannot and should not be used to dismiss all software developed under the open source model. Security and Support concerns are addressed by certain developers of open source software.

That being said, we must re-iterate our position; The Government of Trinidad and Tobago should conduct the necessary studies to determine where Open Source Software can be incorporated into our ICT practices. This would undoubtedly lead to cost savings, employment opportunities and the opportunity to shape the way the country engages in ICT practices giving us freedom and leverage in competing globally with developed nations.

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## 10 References

- <http://www.opensource.org/docs/osd>
- <http://searchenterpriselinux.techtarget.com/definition/open-source>
- <http://www.fsf.org/licensing>
- [http://www.businessweek.com/technology/content/nov2008/tc20081130\\_276152\\_page\\_2.htm](http://www.businessweek.com/technology/content/nov2008/tc20081130_276152_page_2.htm)
- <http://www.gnu.org/philosophy/free-sw.html>
- <http://www.gnu.org/copyleft/copyleft.html>
- <http://news.netcraft.com/archives/category/web-server-survey/>
- <http://www.edri.org/edriagram/number8.12/kroes-supports-open-standards>
- [http://news.cnet.com/ls-open-source-getting-to-Microsoft/2100-7344\\_3-6115914.html](http://news.cnet.com/ls-open-source-getting-to-Microsoft/2100-7344_3-6115914.html)
- <http://blueoxen.com/paper/foss-adoption-in-brazil/>
- <http://open-source.gbdirect.co.uk/migration/benefit.html>
- <http://www.cbc.ca/technology/story/2010/06/03/quebec-microsoft-lawsuit.html>

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