

# Software Studies in action: Open Source and Free Software in Brazil

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## ABSTRACT

This article tells the singular story of the growth of Free Software and Open Source in Brazil - encouraged by the government, opposed by the world's largest software enterprise – throughout the experiments of a country in search of its democratic and independent identity.

## General Terms

Theory.

## Keywords

Open Source, Free Software, Government, Public Administration, Brazil, Software Studies.

## 1. INTRODUCTION

Open Source and Free Software are widespread concepts used by a range of different sectors of society, for not only ideological but also for economic reasons. The Open Source and Free Software (OS and FS) concepts were accompanied by a wave of alternative enterprises, and usually have been used by independent initiatives or companies following fair trade rules. However, it is uncommon to observe governmental agencies dedicating their efforts to implement independent ideas related to software policies. Yet this is what Brazil has been doing for almost ten years.

## 2. HOW EVERYTHING STARTED

In 1983, Richard Stallman proposed the GNU[1] project, which could be considered the foundational act of both Free Software, and later, in 1997, Open Source. Since then, many debates on the role of open and free software have taken place in countries around the world, including China, France and The Netherlands. However, out of all countries, only Brazil has effectively decided to use OS and FS at the deepest levels of their administrative system.

After a debate at the Free Software International Forum (FISL)[2], in 2000 in Porto Alegre, the Brazilian state of Rio Grande do Sul decided to experiment with the Open Source and Free Software's features and licenses. It was the first time that a government had officially implemented OS and FS [3].

On October 29, 2003[4] the Federal Brazilian Government created an official Department to manage their implementation at all

administration levels. Currently, the mission of the Brazilian committee of Free Software (*Software Livre/CISL*)[5] is to help with the implementation of free and open operational systems, database administration, e-mail client, web hosting, and other functionalities for the computers of several governmental institutions. Despite the loud announcement by the Brazilian government, only few public universities, a few public institutions, and some ministries' websites are currently running on Open Source and Free Software systems. Examples include the Ministry of Culture (*Ministério da Cultura*), the Ministry of Science and Technology (*Ministério da Ciência e da Tecnologia*), the SERPRO. In some specific cases, this slow implementation has to do with the fact that some critical sectors of society will be running OS and FS. For example, since 2008, the Brazilian Army (*Exército Brasileiro*) and Navy (*Marinha do Brasil*)[6] have been using Open Source and Free Software to manage their systems, including as online database, e-mail, Internet, graphics, programming language and using the Kurumin Linux as their operating system.

This initiative coincides with the uprising of President Lula's regulation, and even under the presidency of Fernando Henrique Cardoso, in 2000, an initiative called Electronic Government (*Governo Eletrônico*)[7] was released, which has promoted access for poor communities to computers and to the digital world, including as access to text editors and the Internet. Since 2003, Brazil has, for the first time, an ideologically leftist president who came from a labor union and founded a leftist party in Brazil. It was under the presidency of Luiz Inacio Lula da Silva, popularly known as Lula, that the development of OS and FS in Brazil was inserted in the Electronic Government initiative. This act was implemented in the beginning of his term and has been achieving important results in the substitution of proprietary software for alternative systems.

In this age of computers and information technology, such an approach has not been very common in other places, even considering very traditionally politicized and leftist countries such as France or China. What are the cultural and political implications of a decision that may create the most significant community of developers of Open Source and Free Software supported by a state government? How can the Brazilian Army, or the *Secretaria da Receita Federal* (the Brazilian IRS), as official governmental agencies, trust their information to OS and FS Software systems if the data used and processed by them are some of the most delicate and important information for the country? If

we follow Lev Manovich's approach to Software Studies, in which he states that "software is the engine of contemporary societies"[8], what will be the consequences for a country such as Brazil using OS and FS to control their administration? What are the limits of this implementation, considering the strong interests of large software companies? Will the limits be economic or technological?

Since the implementation of OS and FS in the administrative system in Brazil, the country has created innovative ways to deal with this new culture, inviting people to collaborate on the development of features for some of its institutions, e.g. the systems that run the servers of part of DATAPREV (the Brazilian Social Security Administration Information Agency), among many others. These collaborations have created an unusual network of developers spread around the country, producing free tools and support in many features on official websites and processing data in public computers in Brazil.

However, implementing an Open Source and Free Software culture in the heart of a public administration is not exactly a smooth process. In 2004, Microsoft, the largest software enterprise in the world, decided to sue Sérgio Amadeu[9], the president of ITI (National Institute of Technology) and at that time the head of the implementation of the Open Source and Free Software in the Brazilian government. Microsoft considered offensive a magazine interview given by Amadeu in which he accused them of using "trafficker practices" and a "fear strategy" to run their business.

### **3. THE EXPERIENCES: THE ROLE OF THE GOVERNMENT**

The story of the implementation of the Open Source and Free Software communities in Brazil and the ideas and struggles that surrounded this project are described in many places in Brazil but in few specific places around the world[10][11][12]. We can say that Brazil has one of the most prominent experiences dealing with the implementation of Open Source and Free Software in a governmental level and also that currently a significant portion of federal data are hosted on Free Software systems. According to the data provided by Mr. Marcos Mazoni, the President of SERPRO (Federal Service for Data Processing), the Brazilian state-owned institution that provides Information Technology and Communication services for the government and other state owned institutions around the country, the amount of money saved on software licenses by the Government in 2008 was around R \$371.700.500,00 (reais), or USD \$196.000.000 (dollars) [13].

Another interesting fact about the role of Free Software in Brazil was that SERPRO ran a research about the implementation of FS in the government, with 57 questions about institutional data related to FS. SERPRO got 62 results back, and of those 37 didn't answer the research form. According to Mr. Mazoni, basically what these companies don't have is an organized system to regulate the migration from proprietary software to Free Software, and they are missing the necessary internal instruments, documents, and methods of promoting these new features within their companies. An important fact collected from this research is that only 20 companies calculated the amount of money saved using Free Software in their structure, i.e. more than 40 companies weren't even able to calculate it at the time of the research.

## **4. SOFTWARE STUDIES IN ACTION**

What are the consequences of the decision made by the Brazilian government related to the use of Open Source and Free Softwares in all levels of its administration? In what way is the Government dealing with security issues related to the data under their responsibility? In what ways are the Army and the Navy, for example, thinking about National Security if they are using and running Free Software to administrate their data? What are the implications of using OS and FS in areas that are crucial for the maintenance of the borders and security of a country? What are the political implications? What kind of relationship will a common citizens have with the data of his own country when all database, software, computers, and indeed the society in general are all working and running under OS and FS licensed systems? What are the reactions of other countries' to the Brazilian use of OS and FS by its war forces, especially regarding the maintenance of private and top secret information provided to them? Is the use of OS and FS really dangerous? What are experts in the security field saying about with regards to software security vulnerabilities such as "back doors" and other issues? Will these countries trust Brazil when dealing with high level, top secret and private information?

In an interview that we did with Sérgio Amadeu, the former president of ITI (National Institute of Technology), he asserted that the fact that the Army and the Navy are using Free Software in their administrative and security systems doesn't affect the security of Brazil. This is because if the code is open, more people can check for problems, and solve them. This is preferable to having just one or two companies trying to fix problems and dealing with "back doors" for these agencies. The way that Free Software works according to Mr. Amadeu is absolutely open and with no "secrets" for the developers of the frameworks. Of course that you have to trust the development of the system to high level people inside the corporation, as any other function inside these delicate institutions.

### **4.1 Free software society**

Most of the software developed under the support of the Brazilian Government is distributed under free software licenses and can be used by anyone around the world. Brazil has been providing its institutions with resources to develop their own frameworks in order to be independent in terms of information technology administration. However, it is interesting to note that the Brazilian government is also supporting developments of software in areas far from the "administrative" field such as the Ginga, the Xemele and some of the Wordpress and BuddyPress features adapted to Portuguese speakers and programmers.

### **4.2 The Ginga**

Brazil recently decided to adopt the Japanese system for broadcasting digital TV in the country, and it is also negotiating with Latin American countries, such as Venezuela, Chile, Colombia, Bolivia, Uruguay, Paraguay and others to do the same and follow the Brazilian pattern for digital TV systems. To administrate the Brazilian digital TV system, Brazil supported the creation of GINGA, a Free Software specification developed by a consortium of laboratories in Brazil. According to the project's website "Ginga is an open specification, easy to learn and free of royalties, bringing to everyone the possibility to create interactive contents. It gives a new impulse to the community TVs and to

content produced by broadcasters. Its use allows lowering the set-top boxes and other receivers' costs." [14] The GINGA system can be used by companies around the country to set up their digital TV systems for free and they don't need to pay extra fees for the use of the middleware. In this sense, one can ask, why is GINGA free? The project's website explains that "since its conception, Ginga takes into account two principles: the provisioning of a good support for social/digital inclusion, and free knowledge sharing. Ginga takes into account the omnipresence of the TV set in almost all households in Brazil, recognizing that this can be a complementary mean of social inclusion. Ginga provides support for what is called "inclusion applications", such as T-government, T-health, and T-learning." [15].

The adoption of an open and free protocol to administer digital TV is not usual in any other country in the world, and this can be a challenge for most of the researchers who want to understand what is happening in Brazil. Why would a country in which most people own analog TV sets choose to support the development of such a system of information distribution? Aspects of the answer may be political or economic, related to providing access to this technology for the poorest part of the Brazilian population.



**Figure 1. The Ginga logo, with the motto: "Interactive TV is made with Ginga"**

### 4.3 The Xemele project

The Ministry of Culture of Brazil, under the direction of Minister Gilberto Gil, developed a strong agenda towards the comprehension of digital culture and the role of free software in contemporary societies. One interesting project related to Software Studies as a field is the Xemelê [16], which is a play-on-words on the XML extension, and is being used by hundreds of official websites related to the Ministry of Culture projects in Brazil. The project is basically a translation of many tools developed for Wordpress and adapted to the needs of projects run by the Ministry of Culture. Adaptations made by the developers involved design, setup, and the programming new features for systems created by the Ministry. One example is the Ministry of Culture's website, which is an adaptation of a Wordpress theme created especially for them. The Xemelê project also adapted the BuddyPress system, and both were translated both into Portuguese. On the project's website users can download, install and run their own social networks or blogs for free downloaded. The basic idea is to provide people with the tools for them to be self sufficient in terms of information technology and also to give them tools in Portuguese to develop, in an easy way, their own websites. The social network system BuddyPress is being used also to create social networks for the Brazilian government. One of the interesting projects that the Ministry of Culture has been doing with social networks is the Brazilian Digital Culture Forum, a social network that is open to the public and that has a special

goal: to produce and to suggest forms of support, distribution (circuits), and preservation for digital culture artifacts. Users basically run the social network, and usually they represent an important role in the field of discussion mediated by them in the Forum. The experience of the Digital Culture Forum [17], along with the Ministry of Culture's websites where people can create their own profile and post replies to the information that is provided by the Ministry, is a form of direct discussion with the people creating a different form of managing the needs of the people demanding some support for its art, music or simply discussing public support for artists in Brazil. Another important thing about the Forum is its main goal: to create a document that will be used to create governmental laws related to Digital Culture in Brazil.

### 4.4 The Brazilian public software portal

The idea of establishing a Brazilian portal for "public software" was released in 1995 [18]. The concept of the project is the fast implementation of software tools in the public administration to integrate all the States in the same system, creating a network of collaborative developers around the country, promoting the exchange of information between public and private companies, and giving to the public free software for their use in administering cities, companies, and schools. The portal aggregates the majority of the frameworks, systems and softwares developed by state companies, most of them under GPL licenses. Due to ongoing public support, the list of software is growing every day, and it is promoting the use of free tools at almost every level of public administrations in Brazil. The most important systems developed so far have been the Cacic (developed by DATAPREV, the system can provide the exact number of computers in the government, besides also providing the number of licenses that are in use around the country), the openACS (a framework to develop virtual communities based on the web), the e-Prinfo (a collaborative learning system developed by the Secretary of Distance Learning in Brazil), and the Minuano (a system for the transmission of audio and video used mainly by public companies), and there are hundreds more.

## 5. DEMOCRACY AND IDENTITY IN BRAZIL

The history of the democratic system in Brazil has a background changing governments, alternating between dictatorships and populist presidents. In the past 20 years we have had a young and new democracy, and a new Constitution was formulated and announced in 1988. We could spend years discussing theories about the formation of the democratic identity of Brazil, demonstrating the ways in which this identity is brought into question by historical facts, and questioning how all of this is related to the contemporary information society. One important thing is that Brazil, since the end of dictatorship, has been following a path towards a better comprehension of its new democratic position in a global economy. Besides the fact that we have a considered leftist party in power, Brazil has been present in some important global decisions about Free Software and the role of software in society. The fact that Brazil is a stronger supporter of Free Software is also creating a new ideology around the use and the importance of software from a sociological point of view [19]. Of course, it is still hard to change the academic culture – for instance, because most of the universities in Brazil still teach proprietary software programming languages to their students,

Free Software and Open Source systems are not a main topic for these institutions yet. We could ask, why is it so hard to change the academic culture related to programming languages? The answers are not that easy and we could take ideological positions about the role of software in global culture, the way that the global capitalism runs the world related to the production of information technology, and so on and so forth. What we are seeing is that some important federal universities are promoting an important shift in teaching Free Software and Open Source to their students, however so far only a small portion in Brazil are changing their curricula. We also observe that most of the people in Brazil are still using proprietary softwares as their operational system. Despite the fact that we have a strong open source and free software culture, proprietary software is still dominant in Brazil. For most people, this is a “cultural dominance” from these big companies, since they have special agreements with computer producers, offering them advantages in terms of operating systems and also financing their organizations. Nevertheless, a few years ago, some companies in Brazil began producing computers running Linux as their operational system and installed with the BrOffice[20] package.

Even though the government is providing sizable support for initiatives related to Open Source and Free Software in Brazil, the fact of the matter is that Brazilians are far from a scenario where we would find more FS and OS systems than closed ones. This is in part due to the piracy of proprietary systems. In Brazil, unfortunately, we can purchase any operating system on the street for only USD \$5.00, along with various software to install and run on it. It is currently easier to find and to install pirate software than buy a computer with a Free Software operational license system.

## 6. IDEOLOGY, PIRACY AND SYNCRETISM

It is true that nowadays it is not easy to apply simple labels to people and ideas, such as “leftist” and “rightist”, but specifically in Brazil we live in a “syncretic” reality. This concept comes from the field of religion, where it signifies that we can have Catholics mixed with African religions, Presbyterians following Catholic rules, and many others mixtures of faiths.

The problem is that it is not easy to find only one ideological approach to Open Source and Free Software in Brazil. We are dealing with movements that creating features by using free tools, do so for the purpose of various ideological beliefs, and then impose their free features in an authoritarian way. At the same time, other parts of the society are involved with piracy, however we should not forget that in Brazil the piracy of proprietary software has often been viewed by society at large as something acceptable due to the nation’s collective social condition, and that software piracy is even described as an act of resistance against the imperialism of American companies. Sometimes it is clear that OS and FS solutions are being implemented for economic reasons, since legal software has been overtaxed by Brazilian Federal laws and it is very hard for legal software to compete with piracy. Companies in Brazil are afraid of being sued by international software enterprises, and thus the promotion of OS and FS is often more of a marketing flag than it is an ideological issue. Also, parts of the society are using OS and FS licensed applications mixed in with proprietary licensed applications, all without having any ideological problems

concerning the situation. Thus, it is possible that an individual’s use Open Source and Free Software is more likely to be decided by chance and circumstance than as the result of a calculated ideological movement. One of the risks in this case is that this so called ideological approach to the practical problems of software implementation may result in something unexpected by the developers, producing a chaotic situation in which the programmers and users are unaware of the rules and licenses to implement, and unaware what is available to substitute in the future for these systems being produced today.

One of the examples that we can provide comes from some of the poor communities that live in shantytowns (Favelas) in Brazil. These people are creating new forms of technology to spread their music throughout their communities. The interesting thing here is that they are creating a new form of distributing the content, donating their rights to people who are also selling pirate products alongside their CDs on the streets. The difference is that they are not charging for the “rights” to their music, but only making money by selling the CDs produced by themselves in their own community. We can see this new form of distribution happening in cities including Rio de Janeiro, Recife, and in parts of São Paulo. The point here is that even though the distributors are using an illegal system of distribution, the way that they found to promote the music created by them was an unstructured and decentralized system that works in a way that we would need deep research to understand. This small example is just one in thousands that could be provided about the way that Brazil is repurposing technology and subverting traditional ways of running the economy.

Probably because we are still trying to understand the impact of Information Technology in our daily lives, and also due to our social conditions, people in Brazil have still not realized that they are not being systematic in what they are doing. The products being created are just for certain period of time, they are not reproducing more than a certain number of times and they are not registered, even in an informal way, and they usually disappear quickly. Music, records, videos, software, frameworks, systems and lyrics can, after some time, be completely destroyed due to the fact that there are not backups and extra copies of the media vanish. People primarily want to sell whatever is selling at the time that they are producing. It is a real-time economy, and this creates a problem: the vanishing history of produced. Of course, this is not only a problem for these specific communities, but their daily lives are an encounter with the exact risks theorized by many critics of new media and IT: the loss of history and social memory.

This article is a “work in progress” because Brazil is still implementing and discussing the way that Free Software frameworks and systems can be used throughout the entire country. Companies are also creating solutions using Open Source and Free Software systems, and a big part of the society in Brazil is aware of the fact that OS and FS are getting stronger and will become part of life for a significant portion of society in a few years.

## 7. ACKNOWLEDGMENTS

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