

BRAZIL'S ROLE IN EMERGING GLOBAL OPEN-SOURCE INITIATIVES

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“Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather.”

— **John Perry Barlow** *“A Declaration of the Independence of Cyberspace”*

Abstract

This paper will examine the roots and current developments of Brazil's open-source movement. A prime early reason for Brazil's adoption of open-source software was to avoid the necessity of paying royalties to foreign countries. Yet the advent of open source has a range of other effects, including in education and in reinforcing creative currents in Brazilian culture. The Brazilian open source software portal offers programs developed by the government as well as by communities, giving free access to a great variety of software programs. The portal now has more than 59 available programs used by public schools. Another initiative, CDTC (Center for Diffusion of Technology and Knowledge), has developed more than 160 courses and seminars which are being used by universities across the country. Any citizen of Brazil can access the courses and become eligible for a certification. CDTC has a goal of reaching 1 million citizens. Telecentros and Culture Points, another initiative, offers similar opportunities to communities, where students from 16 to 28 years of age are trained to act as "multipliers of digital technologies." Artists, musicians and software developers using open source tools are now reaching global as well as national audiences. Looking forward, Brazilian educational and social organizations will be able to build upon these foundations to reach new markets in Lusophone countries and a wider global audience that appreciates Brazilian culture as a wellspring of openness and innovation.

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The Origin of Digital Policies in Brazil

During the 1950's and 60's, global technology firms began to concentrate on the economic value of producing hardware for computing. Such hardware, built then mostly in the USA, was sold at high prices and the designs were protected by patents. The high cost of imported machines drained foreign currency reserves. In response, Brazil decided to build a national computer industry in the mid-seventies. It decreed in 1977 that foreign computers would be sold in Brazil only if the manufacturer would agree to build them in Brazil and license technology to Brazilian partners. This policy prevailed until the mid-1980s.³

The economics of software were different from the economics of the hardware. Copyright protection to software was introduced in the U.S. in 1980 with an amendment to copyright law, to safeguard creators of intellectual property from almost effortless digital copying of their works. Brazil objected to the law until 1987, when it yielded to the U.S. position following imposition of trade barriers to Brazilian soya exports. By 1998, Brazil had adopted a national copyright law that was among the most stringent in the world – “preventing consumers from uploading CDs into an iPod, a library from digitizing an old book for preservation, or a professor from using excerpts of a film in a classroom,” as noted by Ronaldo Lemos⁴.

Brazil was also among the early adopters, however, of an innovation within the global system of copyright protection that gave equal protection to a “Copyleft” license under otherwise limiting intellectual property regimes – a kind of license that allows people to use the software for any non-proprietary purpose they deem fit, including the ability to modify the software. Such licenses prohibit introducing proprietary restrictions, however, on the modified software – a policy underpinning the global “free software movement”.⁵

Free and open source software (FOSS) as defined by the Open Software Initiative⁶ has the following characteristics:

- Free redistribution
- Access to the source code
- Permission to create derived works
- Integrity of the author's source code
- No discrimination against groups or persons
- No discrimination against fields of endeavor
- Free distribution of license
- License must not be specific to a product

³ Takhteyev, Yuri, “Open Source, Open World,” *Foreign Affairs*, September 13, 2013.

⁴ “A Legacy at Risk,” *Freedom To Tinker*, March 14, 2011

⁵ Takhteyev, Yuri, *op. cit.*, page 3

⁶ De Carvalho, da Silva, 2013, *Open Software Initiative*

- License must not restrict other software
- License must be technology neutral

FOSS licenses allow anyone to view, modify or redistribute the source code, permitting co-creation of open software and democratizing its evolution.

An influential early example of this approach to software development is the Linux operating system. Its creator, Linus Torvalds, was a Finnish student in the 1980s who invited users to freely modify the code he had developed. Thousands of volunteer programmers around the world contributed to its development. Linux developers in Brazil by 1995 had established Conectiva, a project dedicated to packaging Linux for Latin America users.

The public sector in Brazil concurrently began moving at local levels to embrace FOSS,⁷ at first for economic reasons. The idea of developing a portal for “public software” arose in 1995.⁸ The concept of the portal was to integrate public and private companies and giving to the public free software for their use in administering cities, companies and schools.

Use of FOSS at the state government level received an impetus in 2000. The Free Software International Forum, hosted by the State of Rio Grande do Sul, marked the start of state-level experiments with the use of FOSS.⁹

By 2003, the federal government established a committee to implement FOSS for several governmental institutions at the national level. Electronic government (Governo Eletronico) regulations were proposed during the government of President Fernando Henrique Cardoso and implemented during President Lula’s’ term to support the use of FOSS (using the Kurumin Linux as their operating system to manage online database, Internet, programming language, etc.) by federal institutions such as: Ministries of Science and Technology, Planning, Culture, the Federal Service for Data Processing (SERPRO), the IRS (Secretaria da Receita Federal), the Army, Navy and Air Force.

Open source software developed with the support of the federal government is distributed under free software licenses and can be used by anyone around the world. The government also provides its agencies resources to develop their own systems for information technology administration. Due to the ongoing public support, the Public Software Portal is growing every day, promoting the use of free tools at almost every level of the public administration.

Among the systems developed in the Portal are:

⁷ Richard Stallman in 1983 proposed the GNU project (www.gnu.org), considered the foundational act of both Free Software. Since then debate over benefits of open source has taken place in many countries, including Brazil.

⁸ Brazilian Public Software Portal Website: <http://www.softwarepublico.gov.br>

⁹ Williams, S.A. Timeline of open Source in Government- O’Reilly Media (July 15, 2002)

- DATAPREV, which can provide the number of computers in the government and number of licenses being used,
- Open Acs, a framework to develop virtual communities based on the web,
- E-Proinfo, a collaborative learning system developed by the Secretary of Distance Learning, and
- Minuano, a system for the transmission of audio and video used mainly by public companies.¹⁰

The portal now offers more than 59 programs used by public schools. Across Brazil, it is estimated that more than 50 million students now are users of Linux. A federal Decree, n. 7.243 of July 26, 2010, created the Student's Computer Program (PROUCA) establishing that FOSS without license costs will be given priority. Following this Decree 27 states and various cities made laws to encourage the adoption of FOSS. The ProInfo project run by the Ministry of Education is seeking to expand the range of open source solutions available to students, through hardware with specialized Linux distributions focused on primary and secondary education.¹¹

For older learners, another initiative, CDTC (Center for Diffusion of Technology and Knowledge), has developed more than 160 online courses and seminars that are being used by universities across the country. Any citizen of Brazil can access the courses and become eligible for a certification. CDTC has a goal of reaching 1 million citizens by 2014. Telecentros, a parallel initiative to expand internet access, offers similar opportunities to communities, where students from 16 to 28 years of age are trained to act as "multipliers of digital technologies."

According to the Brazilian Federal Service for Data Processing, annual cost savings arising from use of open source software by federal and state agencies amount to more than US\$196,000,000.¹² The benefits have been recognized as going well beyond the economic. The national Government regards open source software solutions for Brazil as more secure than having just one or two companies trying to fix problems and dealing with "back doors" created by these companies and/or foreign agencies. The system according to SERPRO is open and holds "no secrets" for the developers of the frameworks.¹³

The Rise of Digital Culture in Brazil

Beyond their economic, educational, and strategic value, moves to implement open source solutions in Brazil have been welcomed as a means of democratizing communications media – and of nourishing a broad-based digital culture.

¹⁰ Ibid (#4.4)

¹¹ Sancha, Victor and Etseandia, Jon, Open Source Software in Developing Countries, 2013

¹² Silva, Cicero Inacio and De Almeida, Jane, Software Studies in Action: Open Source and Free Software in Brazil, Digital Arts and Culture, 2009.(#3)

¹³ Silva, Cicero Inacio and De Almeida, Jane, Software Studies in Action: Open Source and Free Software in Brazil, Digital Arts and Culture, 2009.(#4)

During two decades of military dictatorship (1964-1985), communication channels were restricted by formal and informal censorship. Ownership of broadcast media channels, moreover, was narrowly concentrated.

As democracy replaced dictatorship, and information technologies become more affordable, opportunities expanded for Brazilians to use digital technologies to freely express and co-evolve their cultural identity. By 2002, interest in free and open source digital content creation of other kinds was spreading rapidly in Brazil. Inspired by FOSS and the related “Creative Commons” movement for digital media, artists, journalists, and non-commercial radio broadcasters began to assemble. A “Tactical Media Lab” was organized in Sao Paulo in early 2003, on the theme of “Digital Inclusion and Networked Communities.” It attracted 6000 attendees and spread awareness of opportunities for civil society as well as public sector creation of freely-shared digital resources.

Gilberto Gil, an internationally renowned musician and Minister of Culture from 2003 to 2008, emerged as the country’s leading visionary and driver of the opportunity. He saw an opportunity for Brazil to go beyond the first waves of digital inclusion – expanding grassroots access to computers, and reducing barriers to the Internet – and engage all parts of society in use of digital resources for creative endeavors:

“Digital Culture is a new concept. It comes from the idea that the digital revolution of technologies is cultural in its essence. The issue here is that the use of digital technologies changes behaviors. The common use of the Internet and free software creates fantastic possibilities for democratizing access to information and knowledge to maximize the potential of products and services, to expand the values that form our common texts, and therefore, our culture, and also to enhance cultural production, creating new forms of art.”¹⁴

Under Gil’s guidance, the Ministry of Culture began in 2003 to redefine “access to computers and the internet not as the finish line, but as a departure point, incorporating thus the reflection on the absorption of new technological paradigms for the cultural field, and the prospect of user’s autonomy, encouraging the consolidation of a network culture, grounded in the possibilities of sharing and coordination of the digital landscape.”¹⁵

Drawing on his experience as a composer, singer and performer in the Tropicalia movement of the 1970’s – a period marked by struggles with severe political and economic constraints – Gil sought to remove barriers between popular culture and new technologies, and encourage new blends of tradition and modernity, and between art and politics.¹⁶ In his words, “the Ministry of Culture should not be a bank teller that gives out funds to preferential clients.... It is not up to the state to

¹⁴ Gil, G. Discourse of the Ministry of Culture at the Master Class at the University of Sao Paulo (www.cultura.gov.br/site/2004/08/10).

¹⁵ Costa, E.2010, ibid note 10.

¹⁶ Carvalho, Aline and Cabral, Adilson, Brazilian Digital Culture Forum: A New Way of Making Public Policies (<http://culturadigital.br/>)

make culture. [Instead it is to] unveil paths, open up clearings, to stimulate, to shelter..." with government startup subsidies to end within three years.

Accordingly, the Ministry opened a series of dialogs and orientations to spread awareness of the opportunities for digital tools for cultural creation and expression. Working with existing initiatives of the Ministry of Communications, which had established a network of rural and urban "Telecentros" telecenters running on Gnu/Linux open source software, Gil's Ministry prepared several innovative initiatives, including:

- **Culture Points** – grassroots studios for virtual content creation, digital toolkits (multimedia equipment with free software for recording, distribution and communication), growing to more than 650 culture hotspots in its first five years of operation. As described by Michigan State University Law Professor Sean Pager, the Culture Points program "attacks the digital divide head on by providing the tools and training to enable hitherto excluded segments of Brazil's populations the means for digital self-expression. Part laboratory for experimental culture, part community center targeting at-risk youth, and part vocational training program and entrepreneurial incubator, the program seeks to channel "the latent creativity of the country's poor" into productive ends."¹⁷ *Source:*
- **"Living Culture"** support network including training resources for artists and musicians interested in Culture Points on how to use the new facilities –including computers and digital cameras, sound and video editing, and web design and streaming technologies – with the aim of enabling greater access in the creation, dissemination and appreciation of Brazilian culture;
- **Support for events organized by "agents' builders of new realities"** – as promoters of FOSS were known – including the Digital Inclusion Workshop, the International Forum of Free Software, and the Free Knowledge Laboratory, among others to identify emerging best practices in the local, regional, national and international digital realms; and
- **Organized online and community dialogs** to encourage public input and feedback regarding future directions for national internet regulation and copyright law reforms, rather to sell a previously-prepared government policy.¹⁸

A key focus of Gil's ministry was on drafting guidelines for proposed reforms of legal and regulatory frameworks that influence digital culture. In keeping with Gil's statements at a United Nations gathering in 2007, the public domain should be a "necessary dimension of the intellectual property system." A cooperative, decentralized process – rather than a top-down political or commercial approach – animated participants, who saw users of the tools as co-developers and partners in co-

¹⁷ Pager, Sean, "The Other Development Agenda: Realizing the Promise of Creative Content Industries," Michigan State University

¹⁸ Carvalho, Aline et al (op.cit.), page 8

creation, with particular emphasis on copyright issues. A web portal funded by the Ministry enabled public comments to be made on draft laws and regulations on an article by article basis, resulting in thousands of public contributions.

Transition and Turbulence (2009 - 2012)

When Gil decided in 2008 to resign from Government and return to his musical career, Juca Ferreira – his former chief of staff – replaced him as Minister of Culture. Juca worked on continuing to advance Brazil’s digital culture, based on inputs from the public, civil society groups, artists and musicians, and open source advocates from inside the country as well as overseas.

In 2009, the Ministry also launched the Brazilian Digital Culture Forum, www.culturaldigital.br, an online platform with five main areas: Digital Memory, Economics of Digital Culture, Infrastructure for Digital Culture, Digital Art and Digital Communication. The platform improved the process of obtaining civil society and grassroots inputs in shaping and responding to proposed public policies. It encouraged greater inputs from government, academia and civil society in the discussion on digital public policies. The project resulted from a partnership with the RNP (Education and Research National Network (Rede Nacional de Ensino e Pesquisa), responsible for the technological infrastructure maintenance of the network, and the conceptual collaboration.¹⁹

Another initiative continued by Juca’s Ministry of Culture was XEMELE. The XEMELE project translated tools developed by Wordpress and adapted them to the needs of projects supported by the Ministry. It also involved design, set-up, and the programming of new features, including support for visual media, and localized the Buddypress system, offering Portuguese-speaking an easy way to design and manage their own websites.²⁰

With Juca’s support, Cultural Points and Living Culture initiatives also continued to grow, to more than 1000 locations. Established local community groups, educational institutions, and private ventures were encouraged to apply for designation as Culture Points. The Ministry evaluated proposals according standardized criteria, with highly-rated applicants receiving a startup multimedia studio kit including of computers, audio and video recording equipment, open source software, and a broadband Internet connection linking also to other Culture Points for sharing and distribution of their creative works. The abiding aim was to promote local autonomy, cultural diversity, and social inclusiveness in urban and rural areas traditionally bypassed by “high culture” focus of Brazil’s traditionally Euro-centric elites.

¹⁹ The book “Culturaldigital.br” by Rodrigo Savazoni and Sergio Cohn defines the Brazilian thinking about Digital Cultura, to provoke reflection and action in the readers.

²⁰ Da Silva, Cicero and De Almeida, Jane, *ibid* (#4.3)

Festivals and conferences with open source themes also expanded. International seminars held in November 2009 and 2010 attracted many of the most luminous figures in the international open source movement, including John Perry Barlow the founder of the Electronic Frontier Foundation, USA, Bob Stein of the Institute for the Future of Book, London, Raquel Renno from the Association of Digital Culture Project, ZZZinc, Barcelona, Amelia Andersdotter, member of the Swedish Pirate Party, to discuss aspects of digital culture from arts to digital rights.

Throughout his tenure as Minister, Juca's Ministry continued to work through online and actual forums on strengthening of free speech, privacy and civil liberties safeguards through a proposed "Marco Civil da Internet" – a law defining the rights and responsibilities of Internet Service Providers to keep records for a limited period of users downloads and other web activity, and to make them accountable to governmental bodies rather than to a private Intellectual Property collective management group (ECAD).

In parallel, the Ministry of Culture under Juca was documenting public of support through its open dialogs for a draft reform of the copyright law. The public comments especially confirmed an interest in expanding exceptions to

Grassroots Digital Culture Initiatives in Brazil

The Culture Point and Living Culture initiatives launched by Minister Gil and continued by Juca have had a number of successes, including:

Teko Arandu is IT lab and web portal created by the indigenous community in Nhandejara to digitally record historical and cultural highlights of from the Kaiowá and Guarani tribes. The website is bilingual (Guarani-Portuguese).

Cultivo cc. Cultivo is the first crowdfunding network to support ventures through the Cultural Incentive Laws of Brazil. It showcases projects eligible for company sponsorship part benefiting from tax incentives of the Lei Rouanet, which lets private firms deduct up to four percent of its assessed income tax to support cultural projects.

Laloca, an initiative of the Laboratory for Locative Media and GPS Films, offers a mobile media studio at the Federal University of Juiz de Fora in collaboration with the University of California San Diego. It focuses on interactive digital video content creation using open source operating systems and applications, including HiperGps, HiperGeo and walkingtools.

Mapa Sonoro do Estado do Rio de Janeiro records "soundscapes" (audio files relating to distinctive features in Rio de Janeiro and Niterói, in cooperation with the Universidade Federal Fluminense. It is seeking to create a "Museum of Sounds" for metropolitan neighborhoods, including favelas.

Circuito Fora do Eixo is a network of artists and audio/video producers from locations beyond Rio and Sao Paulo, Brazil's most active cultural centers. The network promotes opportunities for musicians to perform across Brazil, including small festivals.

Onibus Hacker is a crowdfunded bus, purchased in 2011, that has a webcam, 3G connection and GPS that tours and provides workshops, "Hackdays" and gatherings to plan schools or crowdsourced ideas for policy reforms.

restrictive copyright laws, in creating a more transparent system for managing royalty streams, and in recognizing that copyright laws could be limited by other laws for consumer protection, antitrust, and/or human rights.

Such moves by the Ministry sparked mounting concerns from vested interests. Firms with established software and digital entertainment market positions resisted draft provisions to expand “fair use” and noncommercial use provisions in Brazil’s copyright law, and strongly favored granting a private collective management body for intellectual property to legally require Internet Service Providers to cut off or limit service to suspected violators of copyrighted material under digital rights agreements.

As Lula’s second presidential term came to an end in late 2010, however, it seemed that the momentum behind public sector and civil society efforts to advance open source and digital culture – as initiated by Gil and continued by Juca – was likely to endure.

Lula’s former Chief of Staff, Dilma Rousseff, followed him into the Presidency in early 2011. With Lula, she had earlier attended together the International Free Software Forum (FISL 10) as a gesture of support for digital culture, Internet freedom and free software. During the campaign, she had publicly committed to go ahead with the copyright reform and the digital culture agenda. On taking office, Dilma announced 13 directives as priorities for the Government, including support for "democratization of access to cultural goods."

Yet tension was boiling over intellectual property and open source initiatives. It soon erupted in a way that surfaced deep divisions between the Administration’s stated aims regarding free and open digital culture, and actual practice.

In January, 2011, Dilma appointed Ana Hollanda as the new Minister of Culture. Hollanda, a singer with long-standing relationships to the recording industry and hardline backers of intellectual property rights, lost little time in staking out a new position hostile to the open source movement. Among her first actions was to fire the bulk of the Ministry’s Intellectual Rights Directorship (Diretoria de Direitos Intelectuais), which had been drafting proposed liberalized copyright law reform.

The newly appointed Minister of Culture showed her opposition to the free software movement and Creative Commons licensing in other ways as well. As Ronaldo Lemos of the Getulio Vargas Foundation observed, “She also declared open warfare towards open licenses, especially Creative Commons, which she took off the Ministry site within her first month in power – even though many other Ministries and even the Presidency use open licenses... Ironically, at the same day the licenses were taken down by the Ministry of Culture, the Ministry of Planning issued a normative instruction fostering the adoption of open licenses, and expressly mentioning Creative Commons.” This led

many to question her alignment with the overall direction of the Federal Government regarding reform of intellectual property rights as a means of fostering evolution of Brazil's digital culture.

Minister Hollanda also made clear her desire to protect the private body, ECAD, that was given legal responsibility to collect royalties and other copyright-related revenues. ECAD was under investigation for fraud by a special Congressional Inquiry Commission due to its opaque management practices and exceptionally high overhead charges of 25 percent, among the world's highest.

Despite the backpedalling of the Ministry of Culture on open source and Creative Commons licenses, Brazil was continuing to build visibility as a leader in the global open source movement. In December 2011, the Festival Cultura Digital – an initiative of the Casa de Cultura Digital, consisting of 15 institutions – drew more than 6000 representatives of artists, businesses, academics, and activists and intellectuals in a hybrid format. Held in the MAM Rio de Janeiro (the Museum of Modern Art) and Cine Odeon, the event highlighted national and international projects for the purpose of exchanging experiences relating to digital culture and building new relationships among *cities, states and countries*. Among the attendees were influential open source theorists and practitioners including Yochai Benkler, a Harvard Professor and co-director of Berkman Center for Internet and Society; Michel Bauwens, founder of P2P Alternatives; and Paulo Coelho, an internationally-renowned Brazilian writer who has made all of his works freely available for download. Brazil's growing visibility and presence included hosting in 2012 the Thirteenth International Forum for Free Software (FISL) in Porto Alegre Brazil, an event that attracted more than 8,000 participants – among the largest free/open source conferences in the world.

In at least one key regard, Minister Hollanda's tenure was positive. She introduced and promoted a new concept – “Vale Cultura” vouchers – as a future way to increase popular consumption of cultural works. The proposal was to provide an electronic card with a monthly value of Rs50 (about US\$ 20) for purchase of musical, video, or other creative works. The idea drew a favorable response from many constituencies. Yet the growing controversy over Hollanda's defense of ECAD – combined with growing opposition from academics, digital activists, artists, and many political figures given her hostility to open source initiatives – brought her tenure to an end.

A Renewed Commitment to Open Source Culture (2012-present)

In 2012, to mark a refocusing of the Ministry of Culture, Dilma dismissed Hollanda and appointed as her replacement Marta Suplicy, a former television personality and Mayor of the city of Sao Paulo. Minister Suplicy made clear her intent to pursue a more balanced course by rehiring in October, 2012 key legal specialists who had been fired by Hollanda to the Intellectual Rights Directorship, and subsequently completed updated provisions for a draft copyright law that is currently under review by the Presidency.

In other ways, Minister Suplicy has shown a commitment to nurturing many of the original aims and projects of Gil and Juca. Shortly after taking office, she declared that continued growth of the Culture Points would be the “hallmark of my administration.” As of mid-2014, more than 4,000 hotspots have been established in 1,000 cities across Brazil, most notably in poor rural communities and urban favelas. The local partnering approach has welcomed public-private and federal-local risk-sharing agreements, responsive to diverse community customs and interests. As implemented, observers such as Michigan State University Law Professor Sean Pager has noted the program’s success in turning ‘the latent creativity of the country’s poor’ into productive ends... [in ways that have] reached beyond insider networks and expand opportunities by nurturing talent at a formative stage.” It has been especially impressive, he has written, for the Cultural Points to have seeded a “diverse cultural ecology without pre-empting the market mechanisms that regulate large scale commercial production.” *Source: The Other Development Agenda: Realizing the Promise of Creative Content Industries.*

Two further achievements for digital culture in Brazil have been realized under Suplicy’s tenure. These are:

Adoption of Marco Civil as Brazil’s Internet “Bill of Rights”

In response to many years of public debate and inputs, the Government of Brazil has adopted Marco Civil as the cornerstone of its commitment to internet freedom and protecting protect civil rights online, including freedom of expression and privacy. The law also provides important safeguards to Internet Service Providers, including protections of ISPs from private holders of intellectual property rights who would feel moved to take direct legal action against ISP in cases of suspected copyright violations by their customers. Instead, the Act extends principles of the Brazilian Constitution into online practices with regard to due process, freedom of expression, privacy, and promotion of an environment favorable to innovation.

Announcing the signing of the law at the Global Multistakeholder Meeting on the Future of Internet Governance (“Net Mundial”) in March, 2014, President Dilma Roussef drew special attention to provisions guaranteeing privacy and freedom of speech for users in the country – including user rights to confidentiality of communications. The clear focus of the law on privacy and confidentiality was widely seen as a response to disclosures by Edward Snowden of wiretapping by the National Security Agency of the USA of high-level Brazilian officials, including the President. Tim Berners-Lee, director of the World Wide Web Consortium, also present at the announcement, called mass surveillance “perhaps the most immediate threat to the Internet. Surveillance, of all threats to the Internet, is one of the more insidious ones, because you do not see it happening, unlike censorship.”²¹

²¹ Brazil’s global internet conference includes call to end spying (Grant Gross, April 24, 2014, Tech World)

Roussef made clear at the conference that “Brazil defends the idea that the Internet governance is multi-sectorial, multilateral, democratic and transparent.” She stated that Brazil will be “at the forefront of this legislation because we are the first country to have a law that consolidates the Internet as a free and democratic space, which is essential for social participation, innovation and above all, to exercise citizenship”.²²

Activation of ‘Culture Vouchers.’ Another recent achievement of the Ministry of Culture has been implementation of the Vale Cultura, the electronic monthly coupon aimed at making arts and culture more accessible to Brazilians with low income. Beginning in 2013, approximately a third of Brazilian adults are eligible to receive a monthly stipend of R\$50 applied towards tickets to museums, theaters, and cinemas, to purchase of music and dance lessons, and/or consumption of books, DVDs, and other creative works. Employers have the option of receiving a tax break by funding such vouchers as a benefit to their employees (90 percent of cost of the stipend in such cases is met by employer, and 10 percent by the employee). The initiative is designed to fill a clear gap: studies by the Ministry of Culture indicate that 96 percent of Brazilians have never been to a museum, 78 percent have never attended a live performance, only one in nine cities has a theater and three of every four municipalities lacks a bookstore. Minister of Culture Suplicy has predicted that the vouchers will provide more poor Brazilians “food for the soul” while generating more than 25 billion reais (US\$3.5 billion) annually in new revenues for Brazilian musicians, authors, artists, museums, theaters and entertainment and distribution companies.

Emerging Opportunities for Brazil in Global Open Source Initiatives

For more than two decades, much of the world has looked to North America and Europe for inspirations for Internet innovation and digital culture. This era may be passing. New tools – including the spread of affordable smartphones and handheld tablets that use open source operating systems – are enabling grassroots creation and sharing of digital content everywhere on the planet.

Brazil is increasingly admired for its pioneer role in democratizing the means of creating digital works that can be readily shared. It also has earned respect as a global defender of free speech, Internet freedom, and open source solutions. This gives it a unique opportunity to inspire and assist the world in realizing the potential of digital culture and open source innovations, in both the public and private sectors.

Public sector innovations developed in Brazil, and replicable elsewhere, include:

- ***Open source eGovernment/eLearning resources.*** For more than a decade, Brazil has been at the forefront of adopting open source and creative commons solutions at federal and

²² Brazil Approves Internet Rights Law, The Brazilians, April/May 2014.

state levels of government. Its adaptation of open source tools and learning materials are available on a FOSS license to be freely shared throughout Lusophone countries, and the world.

- ***Innovations to promote digital culture.*** Brazil's innovations in Cultural Points and a Living Culture training network have helped create an ecosystem of artists, musicians, and others in communities with few outlets or opportunities for creating and sharing digital works. Vale Cultura – microvouchers to further spread culture-related learning and purchasing power – promise to open new grassroots opportunities for millions of consumers and makers of digital culture.
- ***Internet Bill of Rights.*** The recently-enacted Marco Civil represents a turning point for protection of privacy and safeguards for free expression. In a world increasingly upset by revelations of NSA spying, and moves by intellectual property organizations to restrict Internet access to citizens deemed to be ignoring copyright, Brazil has staked out a clear position of independence and respect for individual freedom.

The private sector of Brazil also has been at the forefront of inspiring open source innovations, including new funding models that benefit low-income communities as well as deliver solutions to technological challenges:

- ***Generating revenues from creative works without copyright.*** A new revenue model has emerged for creative artists in poor communities, resulting in a thriving, multimillion dollar annual music industry. "Tecno brega" is a system that evolved in poor neighborhoods to reward musicians with out need for royalty payments. Using low cost electronic equipment in makeshift studios, tecno brega producers create recordings that are given free of charge to street vendors, who burn CDs and sell them for a minimal price of about \$1.50 (and who retain the entire earnings from the street sales). These CDs serve as advertisements for live performances in local venues, which charge entrance fees that are shared with the performers. These live events are recorded by the tecno brega producers, resulting in custom-CDs and DVDs featuring the night's concert that are sold as mementos. A special feature of these live events is that musicians and DJs "shout out" to individual audience members attending performances. The "shout outs" can be purchased prior to the show. a personalized element that enhances the memento-value of concert CDs. Each concert generates about around R\$2200 (US\$1000) in entry fees per live performance, supplemented by sales of 100+ custom CDs and DVDs per show. Through this system, Brazilian musicians receive millions of dollars in income despite a complete lack of copyright protection, or income from royalties.²³

²³ Pager, Sean (op. cit)

- **Offering advanced programming tools for world markets.** Another Brazilian open source venture that has drawn global notice is Lua, a lightweight, embeddable scripting language. Developed by a team based at PUC-Rio, the language's power and speed has led to its adoption by Wikipedia, by Adobe (in Photoshop Lightroom), by leading digital TV producers, and by internationally-known games such as World of Warcraft and Angry Birds. Lua's success has resulted in large part from a commitment from the beginning to focus on the global open source community, offering excellent documentation in English. Lua's developers also have come up with innovative funding sources to capitalize on the user base that appreciates its free open-source offerings (the software is distributed under a standard open source license). Although the scripting language may be freely used for any purpose, including commercial activities, users support the Lua project by several means, including buying a book published by Lua.org, making a donation, or buying garments, mugs, and other items featuring Lua logos at Zazzle and CafePress.

Building on the success of such public and private sector innovations, Brazil has the potential to play a leading role in helping other emerging economies realize open source opportunities. It has notable opportunities at hand to advance open source solutions in the countries that comprise BRICS – Brazil, Russia, India, China and South Africa.

At present, the BRICS countries rely on hubs in Europe and the US to connect to one another, which translates into higher costs and leaves open the opportunity for data interception. Because of its high costs the BRICS members are preparing to build a BRICS cable network, an underwater fiber-optic link with two endpoints in Fortaleza, Brazil and Vladivostok, Russia to Miami. This high bandwidth network will cover a distance of 34,000 km and make it possible to facilitate technology sharing, electronic commerce, and financial transactions between Africa, Russia, China, India and Brazil.²⁴

Among the member countries of BRICS, and other nations eager for a world not dominated by superpowers, Brazil has an opportunity for an influential role. In Gilberto Gil's words, "We (Brazilians) have kind of a thirst, a hunger for new things, for different things from the outside world that we can quickly swallow, digest and process. This is a characteristic of our culture and it is showing." Brazil's record of success in deploying open source solutions, its independence and commitment to freedom, and its vibrant cultural and ethnic pluralism make it a potential inspiration beyond its borders. In a world challenged by unrest and upheaval, Brazil seems well positioned to help others enter new era of inclusive – and innovative – digital culture.

²⁴ Brazil: BRICS Cable Aids Cyber-security, September 20, 2013, The Guardian News and Media, UK.