The Evolution of Television in Brazil: a Literature Review

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ABSTRACT
Since its emergence in the 1950s, television has had the power to congregate the family around it, generate discussions and above all offer moments of leisure, information and entertainment to its viewers. With the advent of Digital TV, the technical capacities of the televising system are extended, as a wide array of interactive resources can be offered to the population. Considering this perspective, this paper aims to present an overview of the evolution of television in Brazil based on a literature review. As a result of this analysis, one may notice that Digital TV has all the necessary potentialities to turn the viewer into an active participant, but a great deal still needs to be done to transform this technology into a tool of social inclusion that is established in the institution decree of the Brazilian system.

Categories and Subject Descriptors
A.1 [Introductory and Survey].

General Terms
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Keywords
Digital Television (iDTV), TV Evolution, Literature review, Brazil.

1. INTRODUCTION
Brazil is a country with continental dimensions[1] that still preserves extensive areas of forests and Atlantic vegetation. This great land mass, combined with a high concentration of population in urban centers, must be taken in consideration in any initiatives related to Information and Communication Technology (ICT). The most recent population census, in 2010, registered 190 million inhabitants in Brazil [1].

In spite of these dimensions, open television reaches about 97% of the urban population, thus becoming the means of communication with the largest penetration in Brazilian homes [1]. As such, television is an instrument of national integration. For the consumer, it is the only free network of telecommunications that has national coverage almost 24 hours a day [2].

These figures contrast with those of cable TV in Brazil. According to [3], cable TV represents only 4% of penetration in the Brazilian context. With regard to the Internet, penetration in the Brazilian homes is low, if compared to open TV - only 27% [4].

These figures show that, among the modalities of access to television, open TV is of bigger relevance to the population as a whole. This information can be seen as a good justification for investments in the Brazilian System of Terrestrial Digital TV, since they will be able to bring benefits to a larger slice of the population.

2. TV HISTORY IN BRAZIL
The history of television in Brazil is associated with the enterprising spirit of Assis Chateaubriand, a journalist, entrepreneur, lawyer, politician and diplomat. Chateaubriand was one of the more influential public personalities in Brazil in the 1940s and 1950s. He served a term as a senator between 1952 and 1957, and was also a law professor and writer [5].

Television in Brazil had its origins in two experimental broadcasts: a closed-circuit broadcast in 1939 during the Feira Internacional de Amostras[2] in Rio de Janeiro, and another broadcast in 1948 during the celebration of the centenary of Juiz de Fora city in Minas Gerais state. People from the city of Rio de Janeiro then got a taste of what was to come; on July 29, 1950, TV finally arrived in Brazil. Some stores and advertisers in Rio de Janeiro sold imported television sets from the United States, bought and distributed by Assis Chateaubriand himself [7].

Almost two months later (September 18, 1950), television was officially inaugurated in Brazil by Chateaubriand, but this time in the city of São Paulo [7]. Latin American pioneer[3] PRF-3 (Tupi Difusora, Channel 3) went on the air unscripted, with transmitters bought from the Radio Corporation of America (RCA), in the United States.

In the following year (January 20, 1951), without enough technical structure, TV Tupi (Channel 6) emerged in Rio de Janeiro. (Later this TV station would become responsible for training new technicians who would constitute the body of employees in Chateaubriand's group of TV stations.) The studios did not have soundproofing and scenes were often invaded by ship whistles and the noise of cars, since the

[1] 8,5 million km^2

[2] An International Fair

[3] According to [6], Tupi was not the first TV station in Latin America. Tupi aired its first TV program 18 days after Mexican TV had done so.

windows had to remain open to prevent overheating equipment [7]. "Tupi, both in Rio de Janeiro or São Paulo, was the university of Brazilian television", as everybody there would learn together in scenes full of improvisation. "Everything was a question mark" [7].

In 1955, the second TV station in Rio de Janeiro–TV Rio, Channel 13–went on air. In the following years, Chateaubriand added new TV stations to his empire, introducing them all over Brazil [7]. Thanks to advertising agencies in Rio de Janeiro and São Paulo, and also to so-called ad brokers, television started to gain customers and signal its presence in the market.

Still in the 1950s, several other networks start to emerge [8]: São Paulo TV (1952), TV Record (1953), TV Itacolomi from Belo Horizonte (1955) and TV Excelsior (1959). In 1956, TV stations in Porto Alegre, Curitiba, Salvador, Recife, Campina Grande, Fortaleza, São Luís, Belém and Goiânia were authorized and inaugurated. By the end of the 1950s, the city of São Paulo had approximately two thousand television sets, belonging to wealthy families who brought these TV sets from abroad. In 1951, São Paulo and Rio de Janeiro inhabitants together possessed a total of seven thousand television sets, and by 1952 the number had gone up to eleven thousand. According to [8], the value of a television set was equivalent to three times the value of the most sophisticated radio, and a little cheaper than a car.

In 1963, the first color TV sets imported from the United States arrived in Brazil, but it was only on February 19, 1972 that the first official color transmission in the country occurred, with the coverage of Feast of the Grape in Caxias city in Rio Grande do Sul state[8].

Different from other countries, the standard system chosen for analog transmission in Brazil was PAL-M. This system is a variation of the Phase Alternate Line (PAL) system for color television, developed in Germany and used for the first time in 1967. PAL-M uses a frequency of 60 Hz, and has 60 fields, 525 lines and 30 pictures per second. It differs from NTSC (National Television Standard Committee), the system for color television developed in the United States, in that NTSC has a chrominance frequency of 3.579545 MHz and PAL-M of 3.575611 MHz [9].

On April 26, 1965, TV Globo was inaugurated in Rio de Janeiro and, on the same day at 11:00 a.m., TV Globo São Paulo went on air through Channel Five. On July 17, 1980, after months of strikes, various dismissals and having its concession annulled by the government, TV Tupi closed down its broadcasting. From its inauguration to this fateful day, there was no single month in the history of TV Tupi when the employees had been paid on time. "Tupi was a pioneer in everything, including in the delay of wages, (...) which never arrived complete in our hands" [7].

The federal government then announced, on July 23, 1980, the opening of a competition for two new TV networks that emerged out of the seven concessions belonging to TV Tupi. Apart from these stations, there were also other two TV stations that had gone extinct in the beginning of the 70s. The new concessionaires were the executives Silvio Santos and Adolpho Bloch [8].

The 1990s were characterized by the first cable TV concessions and the beginning of high-definition broadcasts in the United States (1991) and Japan. In Brazil, the first experimental high-definition broadcast was carried out in 1998 by Rede Globo.

Sixty years after the beginning of analog broadcasting in the Brazilian television system, today we are crossing a decisive phase of renewal, with the gradual implantation of the Digital TV system. As in other countries, the digitizing process of the Brazilian television system is gaining force and visibility. The system of analog TV broadcasting in Brazil will last until 2016, pursuant to art.10 of decree n º 5,820 of June 29, 2006 [10].

December 2, 2007 marked the beginning of Digital TV broadcasting in the country. Apart from improving the quality of sounds and images, now without "statics", "ghosting" or motion blurs, Digital TV opens up the possibility of the viewer assuming a more active position in front of a television set, choosing among various additional options in the program being broadcast. Additionally, the viewer can exchange information with the TV station, a reality that is aligning TV sets with other devices and information systems.

This evolution from an analog model to a digital one involves the digitizing process and the adoption of interactivity resources. Apart from configuring the technological evolution of a system, Digital TV arrives with a perspective on diminishing social exclusion, offering the viewer interactive resources that can meet the needs and expectations of different audiences, propitiating new forms of expression, supporting the intercultural dialogue and promoting social mobility.

Today, given the importance that this medium has in people's lives, television is seen as a basic piece of equipment in Brazilian homes, with 97% penetration, lagging behind the stove with 98.5% [1].

3. THE BRAZILIAN TERRESTRIAL DIGITAL TV SYSTEM (SBTVD-T)

SBTVD-T, also known as the Nippo-Brazilian system[4], is a derivation of the Japanese Digital TV model. Apart from the inherent characteristics of the digital system itself, which are better quality of sound and image and better exploitation of the frequency spectrum, the Brazilian model, through technological advances, extends the Japanese model and adds new functionalities to it such as the use of an exclusive middleware and more updated compression standards, thus making the Brazilian model the most modern system among existing ones.

Owing to these technological advances, the Brazilian model offers as a main competitive advantage the possibility of

[4] Countries that have adopted the Nippo-Brazilian standard, apart from Brazil, are: Argentina, Bolivia, Chile, Costa Rica, Ecuador, Paraguay, Peru, the Philippines, Uruguay and Venezuela.

interactivity, mobility and portability. According to [2], while portability enables the reception of the Digital TV signal in cellular and other mobile devices, mobility is associated with the reception of the signal during the movement of the receiver, enabling access to Digital TV in any place and at any time [11].

Interactivity, meanwhile, is undoubtedly the greatest advantage of Digital TV. It is the key for the receiver's access to the world of production and the sharing of content and knowledge by means of television [12].

SBTVD-T was created to guarantee digital inclusion by exploring interactivity resources that enable future access to the Internet and the democratization of access to information. Although these features are still under construction, SBTVD-T's technical features enable the design of various applications in diverse areas of knowledge.

By exploring the Brazilian model of interactivity resources, a lot of applications and services can be created. It is possible to foresee that soon the same bidirectional interactivity resources that exist today on the Internet will also be available for Digital TV.

4. TRAINING OF HUMAN RESOURCES – THE RHTVD PROJECT

The UFSC (Universidade Federal de Santa Catarina) participation in the Brazilian program of Digital TV had already been registered when the NTDI (Núcleo deTelevisão Digital Interativa) participated in a project entitled "Requisito Formal de Proposta" (RFP) 6 in 2004, in which the aim was to generate multimedia content on the theme of "health" that could be accessed by common viewers as well as health professionals in Santa Catarina state.

This work was marked by the interdisciplinary nature of specialists coming from different areas such as telejournalism, software development, medicine, engineering, healthcare and design [13]. Various programs were produced for SBTVD such as: Live More, Depression Test, Spider Bite, Obesity and Obesity Test. All these programs aimed to explore the possibilities of interactivity for Brazilian Digital TV.

The project got financial resources from the Brazilian agency FINEP (Financiadora de Estudos e Projetos), in accordance with the invitation letter of MC/MCT/FINEP and FUNTEL [14]. The aim was to finance and "implement networks of academic cooperation in the country in the area of Digital TV, enabling and stimulating the production of scientific and technological research and the education of post-graduated human resources on the subject" [15].

In order to make the Brazilian Digital Television System viable, in 2006 the Brazilian government invested in the education of human resources by creating the project "Formação de Recursos Humanos para TV Digital (RHTVD) com Foco em Conteúdo e Serviços" controlled by the Brazilian research funding agency CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior). The Postgraduate Program in Engineering and Knowledge Management (EGC) of UFSC was one of the institutions contemplated by CAPES.

As a result of this project, the Sambaqui[5] Digital TV research group of EGC/UFSC was created in 2008. This research group aims "to produce and to spread knowledge by means of contents and services for the Digital TV with a focus on the inclusion of Brazilian society in the economy of knowledge" [16], acting in an interdisciplinary way.

In this sense, each participant of the research group seeks to focus their academic research in order to foster the development of contents and services for Brazilian Digital TV. The Sambaqui group, in a period of only four years, has produced eight master theses and two PhD dissertations, contributing to the education of researchers on the subject of Digital TV in Brazil.

5. FINAL CONSIDERATIONS

Despite the fact that Digital TV migration in Brazil has already been underway for two and a half years, its incorporation is still very minimal; this is a challenge assumed by the federal government.

The majority of users still do not know what advantages Digital TV will make available, apart from a better image without ghosting or statics, as the resources offered until now have been limited to these types of improvement. The availability of a friendly and intelligent tool that accumulates attractive, useful and easy-to-access resources is indispensable for the success of digital TV. Moreover, the interaction process does not have to incur costs for the user, which would risk preventing the user's participation in the process.

It is a government priority to facilitate citizens' access to information and governmental bodies in a quick, free and democratic way, strengthening the relations between them. This process of approximation and inclusion permeates digital literacy.

Citizens, armed with the tools needed to condition them to this access, need to move on to the next stage; that is, to be able to deal with such tools. This process is related to the qualification of the citizen within the process of inclusion and digital education (digital literacy).

As citizens feel more confident and qualified, they start to be more active; they are not only consumers of information anymore. They start to generate knowledge, changing their status from mere users to become partners.

Much more than electronic development that promotes access to the government, it is necessary to educate and prepare people for the communication society, contributing to the speed of economic development and at the same time creating new channels of discussion and exchange of opinions.

The government needs to continue investing in public policies that condition the viewer to be part of this digital network, not only in terms of making these tools available, but also in terms

[5] http://tvdi.egc.ufsc.br/

of qualification. It is only by encouraging and fostering the reduction of barriers that users will be part of the collaborative network of knowledge construction.

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