Inclusive T-gov Application Development in Brazil

Lara Schibelsky Godoy Piccolo, Daniel Moutinho Pataca
CPqD – Telecommunications Research and Development Center
Rod. Campinas Mogi-Mirim, km 118,5
Campinas, SP – Brazil
+55 19 3705-5809

{lpiccolo, pataca}@cpqd.com.br

ABSTRACT

This paper is part of a research project that aims at creating an interactive digital TV multiplatform service, bringing e-gov inclusive and accessible applications developed for Web to TV.
The defined target audience is the Brazilian society, which includes low literacy people and people with disabilities. The universal design approach is taken into account when proposing solutions that considers usability, intelligibility and accessibility concepts are equally important to reach an inclusive t-gov service. Some approaches to develop these applications are presented.

Keywords

Accessibility, T-gov, universal design.

1. INTRODUCTION

Different from most European countries, the free-to-air digital TV was recently launched in Brazil, and pay TV, that traditionally has a low penetration level, has been popularized. These facts reinforce that interactive TV is still a promising tool to help bridge the digital divide [1].

To reach this ambitious target, it is essential to consider the inclusivity of this new technology. This concept is related with the possibility for accessible and enjoyable technology for **everyone**, beyond the commitment to improve the quality of life for the elderly as well as to people with disability [2][3].

Although this moment of consolidation of the technology can be considered the perfect time for proposing technical solutions which consider the Brazilian population's needs within its widest extension, all the digital TV industry efforts in the short run are concentrated to expand the high definition video transmission, and to make the interactivity feasible itself.

Beyond these efforts, this position paper is part of continuing research in Brazil that proposes to create a set of interactive digital TV (iDTV) multiplatform services bringing e-gov inclusive and accessible applications developed for Web to TV. Therefore, the project's background and its intent will be presented, as well as some possible solutions to deal with the technological constraints regarding accessibility imposed by the moment.

2. BACKGROUND

Free-to-air represents more than 90% of the TV sets in Brazilian households. Presently, the digital transmission is available in 10 main cities, broadcasting high definition video content. The population cannot enjoy the interactivity until the Brazilian middleware (GINGA) has been integrated to set-top box by manufacturers and the value chain to offer interactivity has been defined. Although digital cable and digital satellite TV are becoming more popular, pay-TV still has low penetration (around 10%). Telecom operators have recently been allowed to offer TV services as well, creating new offers to the population.

In previous research [3] [4], an analysis of the iDTV accessibility in the Brazilian context was taken. It considered informal, formal, and technical aspects and resulted in a set of recommendations for design accessible interfaces by referring to the W3C guidelines 2.0 for Web and specific iDTV recommendations.

According to the analysis, the current regulations are not enough to ensure that iDTV contents will be accessible to the population as a whole. Representative groups of people with disabilities still require the right to access part of broadcasted analogue TV content with good quality assistive resources (closed caption, audio description, and sign language window). The impact of an interactive contents offer with more textual information, and new interaction models, is still unknown and unmeasured by these groups that will only take it into account when the technology is ready to consume.

Among other issues, the SMTVI[1] project may subsidize these groups of users with information about what they can expect and require from this technology; and may contribute with the iDTV industry proposing possible solutions and recommendations about how to design and to offer inclusive iDTV applications, considering the impacts to the TV receiver hardware and middleware.

2.1 The project purposes

The SMTVI project aims at developing services that encourage people without access to other information and communication technologies to use it.

According to [5], 47% of the Brazilian population has never used a computer and 84% of those people are illiterate. In 2005, nearly 74% of the population had low to medium literacy skills [6]. Sensory, motor or physical disabilities afflicted 14.5% in 2000 [7] [8]. The project stands to conceive inclusive iDTV multiplatform services, such as games, t-learning, t-commerce, and t-gov services, according to the universal design approach. The user interfaces consider usability and intelligibility issues, intending to be flexible enough to be fully enjoyable by the entire population, including people with sensorial disabilities; beyond that, it must be attractive and easy to use, even to first-time users.

3. INCLUSIVE T-GOV APPLICATIONS

To specify a t-gov application it needs to consider the population at large as the target-audience. An experience indicated that literacy levels seem to influence the experimentation and

[1] SMTVI (Interactive Digital TV Multiplatform Services) is founded by the Brazilian Communications Ministry.

appropriation of the technology by the user more than the user's age, but the collective use may help to alleviate this barrier [10].

To preserve the collective way to enjoy TV, the universal design approach was considered adequate for this. Thus, people with different abilities, whether resulting from aging, illiteracy and disability or not, will benefit from accessible products and services, which do not discriminate against them [3].

Usability and intelligibility concerns to this target-audience were previously studied in Web domains according to the user-centered design approach [8], resulting in the creation of proper metaphors and linguist aspects applied to an interaction model (see Fig. 1). To bring the interaction model close to the user experience, many aspects of TV communication language was applied.

Fig. 1 - Screenshot of the e-gov service for Web

This knowledge will be adapted to iDTV specificities in a service called GTV, composed by three t-gov applications: a health service for making doctors appointments and to offer health-related topics contents; an information service about social security; and a job portal that allows the user to send and receive messages from the employers. This service can be offered by IPTV, cable, satellite or broadcast, as illustrated on Fig. 2 [9].

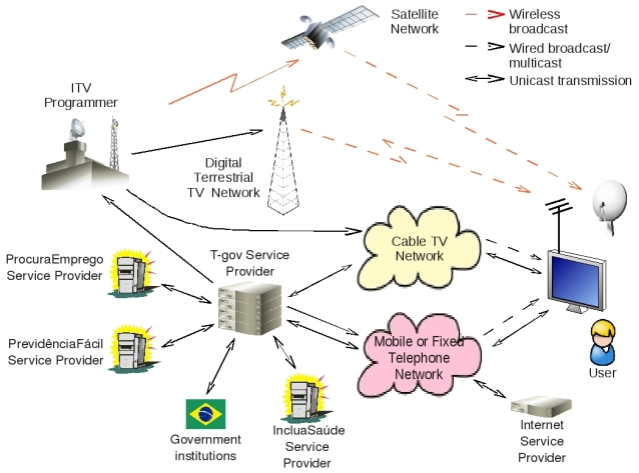

Fig. 1 - GTV architecture

4. THE ACCESSIBILITY APPROACH

It is currently not possible to count on assistive resources such as embedded text-to-speech converters or automatic generation sign language windows on the Brazilian set-top boxes. Intending to follow the recommendations [3] [4], the SMTVI approaches to manage these constraints are:

- To offer pre-recorded audio to all interactive options;
- To produce inclusive audiovisual content with captions and sign language of equal size on screen (see Fig. 3);
- To make audiovisual the primary tool above textual content;
- To evaluate an automatic sign language generation with avatar on the server side of the service;
- To evaluate the execution of a text-to-speech solution on a pen-drive plugged into the set-top box.

Fig. 2 - Inclusive content

These possible solutions must be implemented and evaluated with potential users. The last two possible solutions must be evaluated both technically and with potential users.

5. CONCLUSION

Usability, intelligibility and accessibility are equally important to reach an inclusive technology. Taking into account the technical and regulatory constraints, some approaches to conceive a set of accessible and inclusive t-gov applications for the diversity of the Brazilian society have been presented. After development, the next step is to evaluate the results with potential users, remembering that it may be necessary to create new methods of evaluation that focus on the intelligibility and affective relation of the user with the technology.

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