

DTV GAMES: NEW POSSIBILITIES AND CHALLENGES FOR SBTVD

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Abstract

In recent years, with the course of technological processes, it is noticed that the games are becoming more flexible and stable, including multi-platform environments, and that Digital TV is undergoing a process of converging technologies. The convergence, quoted above, allows an intercom between platforms and technologies so far isolated. It is focusing on this aspect will be an evaluation of the possibility of integrating the dynamics of games with the Digital TV platform.

Keywords: Digital Television, Games, Interactivity.

1. Introduction

The games have won an important place in society and today are one of the fastest growing sectors in the media industry and entertainment. [Oliveira, 2007] states that while playing, the skills and cognitive skills become part of the mental structure of the player, can be generalized to any situation, whether it be child, adolescent or adult.

The gaming provides entertainment to the player, as well as encouraging the resolution of specific problems [Schell, 2008]. The computer games can be classified according to the objective, the following types: serious games (games with goals beyond entertainment), casual games (entertainment) and advertising games [Derryberry, 2007]. The literature references many other classifications, among them may be noted that based on the following elements: platform type, number of players, such an approach and gender. [Elverdam & Aarseth, 2007]. These tools have a number of outstanding characteristics such as: presence of playful elements, goals related to the challenge, elements of virtual reality and interactivity.

With the advent of interactive applications on digital TV, many services may be available to the population as bank, commerce, health, distance education, which involves imposing challenges to contents in a new language, new formats, new interfaces, new actors [Minho et al, 2007]. User participation in Digital TV is similar to the conduct of a player, because the feedback from the application

depends on the answers provided by the viewer. Moreover, in some cases their interactive devices and their graphical features may be common.

2. DIGITAL TELEVISION

According to [Parker, 1999], the Digital Interactive TV (DTV) is something more than just better sound and image, it is a convergence between television, telephony, Internet and personal computer using a simple box, the set-top box (STB), with the promise of extraordinary access to all types of information and interactive communication unimaginable. DTV refers to the transmission of signals in a digital form. Digital transmission allows you to merge content from audio and video with binary data. Thus, it is possible to deliver software applications in a digital TV or a STB. The settop box is responsible for receiving the digital signal using a digital tuner and then converting it to an analog format to be viewed in an analog TV, or may already be built into the TV in the newer models.

Digital TV has focused in recent years in Brazil. Especially after it created the national standard based on some parameters of the Japanese standard (ISDB-T), called Ginga ®. This national standardization is formed by a set of technologies and innovations that make the specification of advanced middleware and the best solution to the requirements of the country. To streamline application development and reduce costs, thereby consolidating the DTV, manufacturers and content providers realized that the solution is to adopt mechanisms that make portable applications and services in different types of STBs.

In this sense, to meet the requirement of portability, the STBs should provide an applications API (Application Programming Interface) generic, standardized and well defined. This API should abstract the specificities and heterogeneity of hardware and software of various types of receiving devices.

2.1 Interactivity

The interactive television, with the advent of the Interactive Digital TV, is undergoing a process of evolution. [9] rate the interactivity level of interaction: ranging from turning on and off the TV; changing the channel switching by remote control; VCR and video game use; users opining about a television content by

phone or mail, to into a first stage of interactive TV, which lets you choose camera angles and navigate the information.[Montez & Becker, 2005] extend this definition by providing new levels of interactivity in which the User can submit his own content, reaching a stage similar to what happens on the Internet today, where anyone can have its own website and even make the diffusion their own visual content. [Gawlinski, 2005] defines what we call interactive TV as something that allows the establishment of a dialogue between the User with the program or service.

2.2 Challenges

At the international level, we see many jobs and experiences that shows us details of how we can develop games for DTV. Items such as [Nolan, 2002] and [Heliö & Järvinen, 2003] shows ratings for TV games, challenges for the development on this platform and also offers immediate and future solutions to such problems.

[Nolan, 2002] shows the profiles of people who play on television, classifying them in Generation I, Early Clickers (young clickers) and Daytime Dabblers. The Generation I corresponds to young people that play a game without sticking to play it again nor what channel the game is being transmitted. They simply navigate between games and navigate between the channels, looking for some quick entertainment. Early Clickers match children between 3 and 10 years of age who are familiar with the technology and have computer access imposed by their parents, and their attention shifted to the TV. The last group is represented by people who are not familiar with technology, but they see TV as something that they can dominate. They play because it is an easy way of entertainment as they are easier than the other services to the TV.

Games on TV can be used in different ways. They can be used as only thing transmitted by a TV channel, that is, a channel specialized in games for digital TV. They transmit games as if they were TV shows, so players can practice every day, and even submit their records from the return channel. An example of a channel is the PlayinTV channel, one of Europe's largest, showing in your list of games to TV more than 200 titles, ranging from classic games like chess, their own creations as the Frogs, whose goal is to move to frog back and jump across the river to escape the challenges.

New challenges are raised to begin the production of games for digital TV. Initially we can think of three major problems: hardware, programming and usability. When we think of hardware, we see that the STB being marketed today have little memory and low processing power, taking us one step behind what we have in game levels in the rest of the platforms, i.e., we have to

take work with little memory capacity and physical space for storage and transmission of the games. At the level of programming, we have limitations on the techniques that can be used to develop the game, for example the use of three dimensions objects are almost impossible due the fact of hardware limitations. At the level of usability we have a problem with the user interface device, the remote control as a tool for interaction.

4. ARCHTECTURE FOR DTV GAMES

The developed architecture explores all possibilities of communication and use of games produced for digital TV. The proposed architecture is shown in Figure 3.

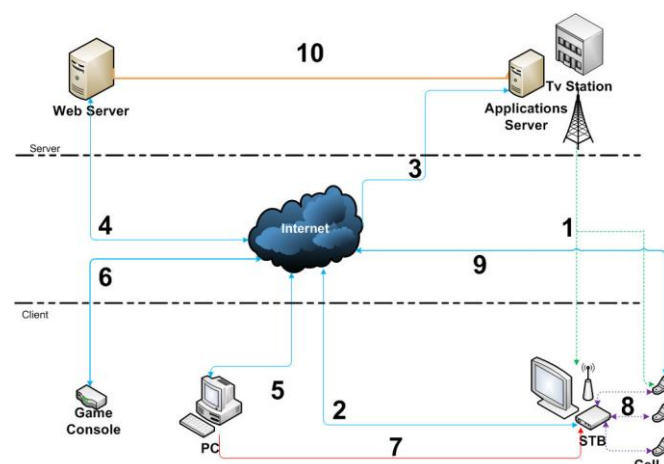


Figure 1 Architecture for DTV Games

The components in Figure 1 are:

- Station/Server applications: they form the TV Station, which is responsible for sending in broadcasting the digital television applications. The Application Server is where the applications for digital TV are hosted, and then are transmitted by the broadcaster;
- Set-Top-Box (STB): is the equipment that connects to a television and an antenna which converts the received signal from the antenna on content in a format that can be displayed on the screen. It is necessary that the device supports interactive applications, otherwise it would just be a digital converter, unable to run the interactive applications;
- Mobile: a cell phone that has support to communicate with the STB, using technologies like Bluetooth or infrared communication;
- Personal computer (PC): A computer that has access to Internet;
- IP network (Internet): is the means through which is made use of the return channel, thus connecting the various devices;
- Console: video-game with free internet access;

- Web Server: server of pages and web applications, as well as databases, web services and others;

The bonds numbered in Figure 1 are:

1. The transmission in broadcasting digital signals coming from the station for devices that support them, that includes cellular and STB;
2. Represents the return channel from a STB, where this channel is done in communication with the Internet;
3. Represents the communication with the Internet application server of a TV station;
4. Represents the communication with the Internet from a web server;
5. Represents the communication with the Internet from a PC;
6. Represents the Internet communication console video game;
7. Represents the communication made by hand between a computer and STB. An example would be using a flash drive;
8. It is the communication between an STB and a cell phone, that means, the use of your phone to extend the application of TV;
9. Represents the communication with the Internet from a mobile phone;
10. Local communication between a Web server and an application server;

Now we show the possibilities of games that arise based on the architecture and its connections:

4.1 Local Broadcasting Games

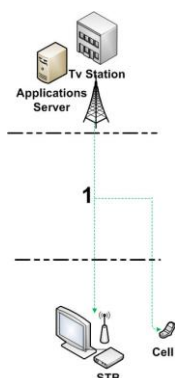


Figure 2 Local Broadcasting Games

These games are played only locally. They would be sent by the TV Stations. Games like Tetris and Pac-Man are examples of possibilities in this communication. These games need not be independent of programming games. They can complement the TV show, like a set of questions and answers which these are already incorporated in the application.

4.2 Local Downloadable Games

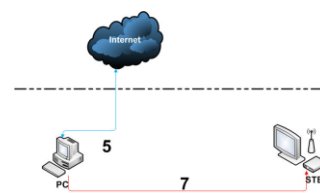


Figura 3 Local Downloadable Games

Games downloaded from the computer then executed on the STB. Possible uses these paths are to advertising promotions, for the players to replay games that have been played during programming or programmers specialized in TV sets that offer games for download, so players can have free access to their games, regardless of transmission by the station. Tetris and Pac-Man could also fall into this category.

4.3 Games with Return Channel

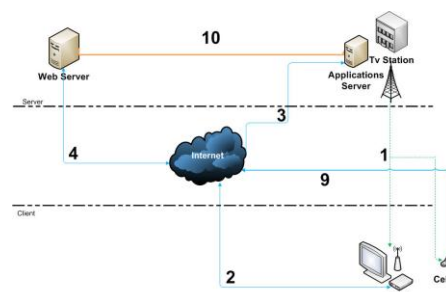


Figure 4 Games with Return Channel

Games that use the return channel for sending and receiving information to the TV station. Such information could be obtained from the score of the player to form a ranking of the best players and possible dissemination of the results after the close of transmission of the application where examples would be Tetris and Pac-Man, so this time with the score being sent by the return channel. You can also think of a game where you interact in real time with the TV program that is being displayed, for example, if we think of a program of question and answers between the participants of the program, viewers could at the same time as the participants answer the questions in real time, and could somehow participate in the dispute, even for a possible consultation with the participants in doubt. Other kinds of games in this category can be seen in [Gibbs et al, 2007], where are shown games where the viewers play in real time against the pilots in a real race.

4.4 Network Games

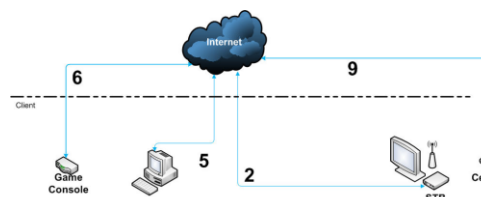


Figure 5 Network Games

Correspond to games that are played online as competitive or cooperative modes, regardless of the platform they are running. Examples of games in this category would be multiplayer games such as poker, chess, checkers, dominoes and others. Such games at first did not seem to be the profile of a game console video game that we have today, but consoles like PS3 and X-BOX 360 have the ability for players to download simple games for free in their internal networks consoles, these games have a less complex profile as such, and a version for digital TV to compete with others can serve as brand awareness.

4.5 Additional Games

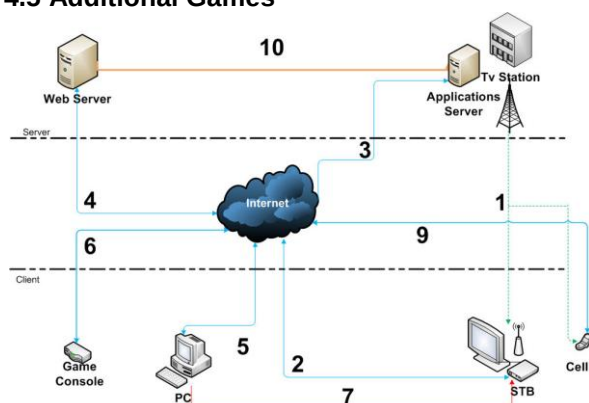


Figura 6 Additional Games

Adding the link 4(four) in our games network, we create the possibility of additional games, where different devices could play within a play with complementary roles, for example, if you play an online game on your computer, you could play new tasks or gain extra points playing a extension of that game on the TV.

4.6 Games with External Interface

The link eight can be added to all applications running on the STB. It brings two new possibilities for these applications: the possibility of multiplayer because many phones can communicate with the STB at the same time, then the STB is used as a server for the phones, and also the ability of people to play without having to disturb the other people that are watching TV, because while the programming of the station continues to be shown, one of the viewers can pick up your phone and run the game without forcing the others who are watching TV to see your game.

5. CONCLUSION

After the show possible ways to interact with games using the Digital TV platform, we can infer that when you enter new technological approaches in architecture television can increase the whole lot of services offered to classes that only have the television as a medium of entertainment. Thinking about the interactive approach

as an element of inclusion is substantial for the use of games.

Furthermore, another fact that can be proven is that SBTVD has a proven ability convergent. This is due to have originally referred to in Japanese broadcast standard that focused on portability, i.e. the possibility of transmission to mobile devices. But, as the Brazilian standard was being developed, he was taking the guidelines of its innovations, i.e., a concern with set-top boxes more accessible, opportunities for various forms of interaction on the platform, among others.

Finally, we examine these various forms of interaction architecture conclude that these models are not only compatible with SBTVD, but with any systems Digital TV interactive use any type of game and application.

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