

From Analogue to Digital: Television Sound moving towards New Media. Stationary Sound Applications and Mobile Sound Applications

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ABSTRACT

The television sound is going through major changes. Analogue television sound has been broadcasted **one-way** – from broadcaster to receiver and the idea of broadcasting has been **top-down**. Now digitalization of television sound is going to change from receiving to using and adjust. The purpose of this text is to show what kind of sound applications there will be as available in future television. The digital television has good possibilities to offer several types of sound services. This paper is a part of my dissertation about television sound moving towards new media. The Stationary Sound Applications and Mobile Sound Applications are the most central issues when television sound is going from analogue to digital.

KEYWORDS: Audio, broadcasting, digital television, Hi-Fidelity, interactivity, sound quality

1. INTRODUCTION

Television sound has been analogue since the 1930s. Since then it has moved toward digitality almost 30 years after the 1970s. The digital television is taking its first steps offering more in sound.

There has been convergence in communication media during the past 20 years but not much attention has been paid to sound. Talking about Interactivity, sound is mostly connected to the picture. But PCs and digital television integration offer more opportunities to interactivity. Of course digital television is a more suitable arena for easy sound applications than PC.

Surround Sound is one application for digital television and we have already seen applications coming through (for minorities; text-to-sound) in digital television. In the future, there will a larger variety of applications. Surely broadcasting has its limits when offering sound applications.

As a whole, television sound is becoming digital. Since 1990, television programs have been produced and done digitally. They are received digitally as well. Surround Sound must be seen as a means of using the sound, in stead of just listening to it.

2. RELATED WORK

Most researches of digital television are related in visual aspects, usability, economics or broadcasting systems etc. In sound, the researches have been technological, being associated to Surround Sound, acoustical measurements and speech researches. Aesthetics, media theories' or historical points of view towards new media have rarely been subjects of research.

Some researchers have done dissertations about digital television like Pertti Näränen, Seppo Kangaspunta, Leena Eronen and Kari Jääskeläinen, but none of these is related to sound. Amitabh Kumar writes very much about broadcasting systems of digital television and he has small sections about applications to digital television and mobile phones.

About sound history there is very much material of sound broadcasting and sound itself. AES (Audio Engineering Society) got much articles about sound quality and technical data.

3. BROADCASTING SYSTEMS TO DIGITAL TELEVISION

The basic idea of broadcasting systems can be called today as a *net*. Paul Barans' thinking (Gere 2006, 68) when talking about the net has three aspects. In the first model there is a central unit and many receiving points. The second model includes many broadcasting units and the idea is non-centralised. The third model is a pure net. These aspects of broadcasting and receiving has its ideological points of view.

Today when broadcasting sound and vision we use four categories of broadcasting modulation standards: DVB-T, DVB-S, DVB-C and DVB-H. Broadband will be the next system for broadcasting the HDTV. It is said that its capacity will be 100 Mb/second or more. This huge amount of capacity has room for future thinking with applications – the sound applications have to get more room when broadcasting and interactivity has to get its capacity.

The basic idea of broadcasting is simple: TV and radio channels send digital encoded MPEG materials to the multiplex and the byte stream will continue to the antennas, the received broadcasted program then being translated back to the analogue audio signal. Byte rate reduction and compression will be used. Broadcasting and receiving the MPEG – 2 stream is coded and decoded and the multiplexed material includes the program information (Crinon,

Bhat, Catapano, Thomas, Loo & Bang 2006, 115 – 116).

Within the standardisation of broadcasting systems there are possibilities of serving many kinds of applications in digital television as well in broadband and mobile systems. Serial Digital Audio Interface standard was agreed jointly between Audio Engineering Society and European Broadcasting Union 1985 and this specification allows distribution of uncompressed stereo audio signals as a serial digital bitstream (Jones, Defilippis, Hoffman & Williams 2006, 25).

4. SURROUND SOUND AND DIGITAL TELEVISION SOUND QUALITY

Surround Sound is coming to the digital television environment. It has got its basic idea from the cinema sound.

We should talk about the Hi-Fi (High Fidelity) as a normal situation with television sound. Byte reduced sound and compression does not always offer the best alternative to the sound. In television we have got monophonic, stereophonic and sound dubbing. In Finland the Surround Sound (AC3) will get a capacity 448 kb/second. This is enough to get a good quality of sound.

A strong byte reduction combined with a low sampling rate will result in a poor sound quality. When the byte reduction is low and the sampling rate is high, the sound quality will be good. In general, the packing of sound seems to cut the top quality off from the sound – what is called Hi-Fi.

There are still other ways to determine the sound quality of digital television. Poor frequency response, unclear sound field, disturbances in broadcasting and poor channel separation.

A good sound quality will be a result of low byte rate reduction. This should apply to the whole broadcasting chain. This can be reached by using a high sampling rate for digital audio. Of course good frequency response after that and good channel separation are fields that should be taken into consideration.

Good sound quality could mean other things, such as high quality sound applications and a functional broadcasting system. Functionality is the first requirement for functional Surround Sound.

5. STATIONARY SOUND APPLICATIONS AND MOBILE SOUND APPLICATIONS

Sound Applications are divided in two categories. The first one is Stationary Sound Applications and the second one is Mobile Sound Applications.

Stationary Sound Applications are used in home environment, including PC, Internet, digital television and connections between them. Sound equipments will be connected to PC and to a Set-top box. Sound systems are fully digitalized. There will be next kind of applications to home environment: packed files, alert sounds, games,

sound services, guide tones, signal tones, music libraries, speech recognition etc.

Mobile Sound Applications mean using sound applications when going outside and to public places. All mobile systems can be connected to cellular phones and laptops. Public transportation can be equipped with wireless systems. There will be next kind of applications in public places: sound navigation (Nokia 2008), packed files, radio and tv programs, news.

Joseph Weber and Tom Newberry (2007, 86) have dealt the multimedia in following categories: video conferencing, streaming audio (audio packing), Internet telephony, streaming AV-services (IPTV). When transferring audio packages to the customer, the stationary or mobile capacities are quite small. Large amounts of bytes are not required to get the applications to your cellular phone or digital tv.

DVB – H (Digital Video Broadcasting – Handheld) is mobile broadcasting where the radio and television programs are sent and listened to in mobile phones and laptops. The interactive services are there as well. DVB – H uses 2G and 3G nets as a return channel (Cave & Nakamura 2006, 4.)

6. DIGITAL TELEVISION AS A POSSIBILITY

Richard Sennett (2005, 143) has described sound equipments as a physical possibility. iPods' commercial success is related to its' great capacity to save so much music that no-one is able to listen it through during one day. A similar allurements should be found for digital television to make it easy to use the sound applications or sound services.

Stationary Sound Applications are a part of digital television sound system in home environment. Sound applications mean interactivity with digital television or PC, if connected to digital television.

From digital television we can get television and radio programs, communication services, information services and other sound applications. When designing these solutions we have to seek interactivity and understand technology and user-interfaces. We also have to pay attention to user groups and products that we are serving.

Digital television's Sound applications could provide both public and commercial applications. These two sectors could offer services to citizens using both stationary and mobile solutions. There could be several kinds of services, such as information, archives, signals, alarms etc.

Since the beginning of year 2000, there have been efforts to get the MHP solutions to the markets and applications have been created for the needs of the banking sector, companies, marketing, games, multimedia and video conferencing etc.

Digital television systems belong to the Stationary Sound Application environment. The connection between Personal Computer and digital television gives a variety of possibilities for the user. These are CD, DVD, sound applications, sound services, information etc. Connection with PC brings multimedia available. Music, games, extra information (advising & service) can be used through digital television.

Brecht and Kunert (2005, 163) see that when talking about sound there should be at least the play, stop, rewind and forward functions. In addition to these several kinds of other functions should be available. Tuning, the equalizer, marking the starting point and the end of material should be there as well.

John Carey (2003, 54) wrote that ITV can be made to increase people's own convenience rather than requiring them to follow a fixed television schedule. Flexibility will be improved when using sound applications.

7. CONCLUSIONS

The sound applications should be easy to use and user-interfaces must be simple. EPG is a suitable user-interface. Then the broadcasting capacities should be high enough with the broadband. And of course the interactivity should be found with the feedback possibility.

Before you have just watched and listened to the television – now your connection is moving towards using and adjusting.

Packing files offers the possibility to use the files once again and adjusting the files is a new possibility to find something new. Stationary Sound Applications and Mobile Sound Applications will be the next generation of going digital with television sound. Understanding, using and adjusting the sound, as an interactive methodology, makes the user active. Getting information in sound gives many kinds of possibilities within both, stationary and mobile services.

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