Audio Description of Television Programs: A Voluntary Production Approach

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Abstract. Audio description (AD) is an audiovisual translation technique targeted to visually impaired people enabling them the full access of visual content. This technique can be applied in several contexts, as is the case of Television, where a professional storyteller describes the visual scenes not perceptible by viewers with blindness and low vision, based on a pre-produced script made by a screenwriter. In this way, the production of AD is a costly and complex process, involving different professionals and procedures. Besides that, many countries, like Portugal, do not respect the minimum obligations mandated by the law related to the use of audio description in television programs. Despite this scenario, the current television eco-system provides possibilities to enhance this technique, leveraging the number of audio described TV content for people with visual impairment. In order to change this situation, we intend to develop a platform that supports AD production for television programs based on a voluntary model.

In this context, the paper aims to describe the platform, pointing out its functional requirements from a comparative study between the professional process of AD production and the voluntary approach to be developed.

Keywords: Accessibility · Television · Visual impairment · Audio description Volunteering

1 Introduction

Audiovisual translation is commonly used in the television context, especially to help the interpretation of foreign content, using techniques such as subtitling and dubbing. When the contents are in native language other techniques, like voice-over and description, also support a specific kind of audiovisual translation. In these techniques, the management of verbal and nonverbal components of the narrative are required [1], demanding human intervention. The role of these techniques in the development of accessible TV contents is of major importance, because they enable its access to people with special needs. In the specific case of viewers with visual impairment, they benefit from audio description (AD).

Audio description is a media feature designed for visually impaired people to enable, via audio, the access to visual content, such as TV programs, in which a storyteller describes scenes that are not perceptible by these users [1]. The 'RTP1' (the public

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Portuguese TV station) is the only one in Portugal that broadcasts regularly some of its programs with AD [2], although other Portuguese stations are also required by law to broadcast programs with AD [3]. Viewers with visual impairment can access AD through two ways: by radio or Digital Terrestrial Television (DTT). These options are only compatible with the DTT platform, excluding customers of pay-tv services (the TV platform more used in Portugal). Besides that, most of the time, audio description (for television and other contexts) is performed by qualified professionals through specific technical resources, which makes it financially expensive. Therefore, the creation of a model of volunteering to perform audio descriptions of TV programs clearly becomes advantageous.

In this context, this paper is based on a project that suggests a new approach for the creation of TV audio descriptions that is supported in the recording of real time audio descriptions made by volunteers who do not need to have technical skills to perform the process. On the one hand, the project intends to offer more AD for TV through the development of a cross-platform application for the creation of audio descriptions by volunteers and, on the other hand, it aims to change the way audio description is accessed by viewers with visual impairment through the development of an Interactive Television (iTV) application accessible to this public. In this paper, the platform to be developed is described and its functional requirements are identified from a comparative study between the professional process of AD production and the voluntary approach.

In the next sections, the state of the art related to this field of research is presented and the platform for the creation of audio descriptions is described. After that, the methodology that was used to conduct the study is explained, pointing out the results obtained. The paper closes with the final comments and the work to be done in the next phase of this study.

2 Related Work

In Portugal, the current situation concerning the relationship between users with visual impairments and television demands more effort in this research field, since there is a significant number of people with this type of impairment who do not entirely benefit from the capabilities of the current TV paradigm, such as audio description. According to the 2011 Portuguese Census, 9.3% of the population over 5 years old (about 921,000 people) is visually impaired, 97% of them (about 893,000) have great difficult in seeing and the remaining 3% (about 28,000) are blind [4]. Besides that, Portuguese viewers with visual impairment can only follow some series of RTP1 (the public Portuguese TV station) with audio description. This AD is accessible through an outdated system - the medium wave of Antena1 (the Portuguese public Radio station). The TV program is broadcasted via the free to air TV network and the audio description is simultaneously broadcasted via radio. More recently, through the Digital Terrestrial Television (DTT), the RTP1 audio description is broadcasted in a secondary audio channel but this setup is still inconsistent [2].

The international scenario on the audio description is quite different from Portugal. For instance, in the UK the broadcasters have a legal obligation to provide at least 10%

of its programming through audio description [5] and in USA, the local stations of the 60 zones of the country with greater use of Television are obliged to broadcast about 4 h a week of programs with audio description [6].

However, the Portuguese academia being worried with this situation has performed significant efforts to counteract it. Neves [7] is a precursor of several projects that encourage the use of audio description in several domains. Oliveira et al. [8] has some work in the field of interactive television, suggesting an adapted system to visually impaired users supporting access to audio description. In Spain, the 'AudescMobile' mobile application was created allowing the access to AD of several types of audio-visual productions, using audio fingerprinting (analysis of a sound excerpt recorded by the application) [9]. The WhatsCine app [10], also created in Spain, allows the access of audio description, subtitling and sign language in television and movie theatres. In Brazil, there are projects related to the promotion of audio description; for example, Campos [11] suggests a mechanism based on semantic web application for the automatic creation of audio description for movies and Domingues et al. [12] proposes an automatic system to create audio descriptions. In the United States of America there is a free and experimental tool developed as part of an academic research that allows adding audio descriptions on YouTube videos [13]. The audio descriptions can only be created and accessed through the 'YouDescribe' web tool.

Concerning the volunteer model to provide inclusive services, there are several European initiatives that take advantage of it for the creation of audiobooks [14–16], audio description book illustrations [15] or audio newspapers [17] and for the supply of geographical information [18] and social initiatives [19].

In Europe, there are also more extensive audiovisual translation projects, such as the 'HBB4ALL' [20] that aim to promote a wider availability of accessible media aids to all viewers with special needs (like audio description, subtitles and sign language). The project aims to make a cross-platform production and distribution of accessibility features more cost-efficient and more flexible and easier to use, benefiting users and also broadcasters and media producers.

3 Real-Time Audio Description Supported in Volunteering

In this section, the new approach for the creation of audio descriptions by volunteers is described.

The real-time audio description is supported on a volunteering approach that has as main target relatives of visual impaired viewers for the creation of audio descriptions. Usually, these persons have a predisposition for description because they regularly help their visually impaired relatives during daily activities, such as watching TV, reporting what is happening on the screen. So, the advantages of this model are the reduction of costs in the production of audio description and consequently the greater offer that it generates.

In a starting study related with this technique (previously performed by the authors of this paper) it was possible to find that volunteers were satisfied with the procedure used to create AD and visually impaired users felt that this type of AD assisted them

[21]. It is worth to say that as these new approaches demand a preprocessing phase, they are especially relevant for non-linear TV programs, for instance those available from the video-on-demand (VOD) service or the Catch-up TV service of Pay-Tv providers.

The concept for the real-time and voluntary approach will be supported in a cross-platform solution (web and mobile) for iTV and will be sustained in the following workflow (Fig. 1): (1) recording of the segments of real-time audio description to be carried out by the volunteers synchronously with the television content (the platform will recognize the favorable moments for inserting the AD segments); (2) uploading of the resulting audio file into an audio descriptions repository (after the upload, it is intended that the community itself evaluate the audio descriptions in a gamification model, through, for example, assignment of points); (3) providing the audio description through an iTV application (usually a catch-up TV program or other non-linear one). It is also foreseen to provide the possibility of selecting the audio description by various criteria (e.g. name of the author or rating).

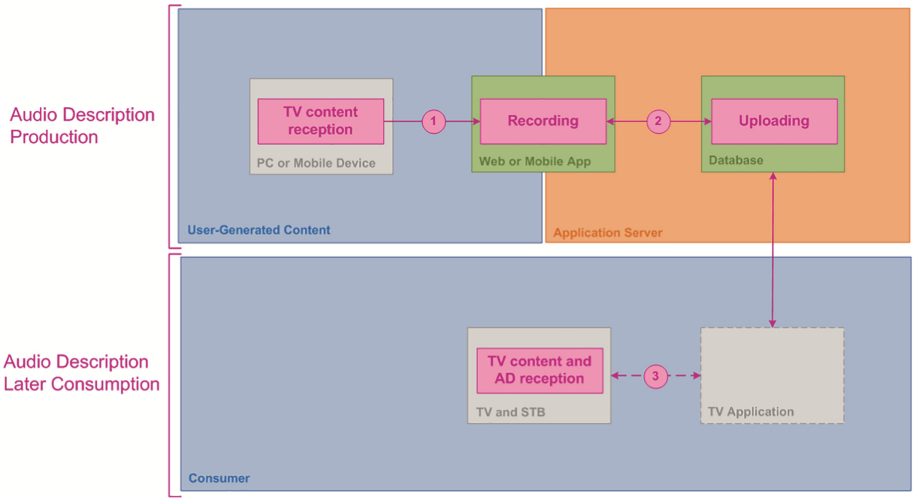

Fig. 1. Workflow of the voluntary approach for AD creation

4 Study of the Functional Requirements of the Platform of Voluntary AD

Before starting the identification of the functional requirements of the platform of voluntary audio descriptions, it was necessary to deeply understand the concept and creation process of audio description. After this analysis, the authors were enabled to proceed to the comparison between the professional process of AD production and the voluntary approach. From this comparison, the authors identified and defined the functional requirements of the platform.

4.1 Concept and Creation Process of AD

Audio description is an audiovisual translation technique specially designed and developed for people with visual impairment and is susceptible of application in various spaces and contexts such as TV programs, cinematographic content, performing arts, DVD's, museum contents as well as cultural spaces. The descriptions of dynamic visual elements of movies, TV programs and performing arts should be inserted into the pauses of the original soundtrack of the production. It is important to avoid AD over audio that is essential to comprehend the narrative, but it can happen when is necessary to provide crucial and imperative information. Besides that, it is also important to leave pauses without AD when is appropriate to support the ambience [22]. In this sense, audio description only makes sense in combination with the original sounds, music and dialogues. For dynamic narratives, AD can be recorded (e.g. movies and TV programs), or it can be performed live (e.g. performing arts). In the case of movies and TV programs, a storyteller does the description of the scenes or images that are not noticeable by the visually impaired viewers and that description is broadcasted usually when there are no dialogues.

The United States Government deliberates audio description as an accessibility standard and describes it as follows [23]:

> *"Narration added to the soundtrack to describe important visual details that cannot be understood from the main soundtrack alone. Audio description is a means to inform individuals who are blind or who have low vision about visual content essential for comprehension. Audio description of video provides information about actions, characters, scene changes, on-screen text, and other visual content. Audio description supplements the regular audio track of a program. Audio description is usually added during existing pauses in dialogue. Audio description is also called "video description" and "descriptive narration"."*

In Fig. 2 is shown a scene of the movie 'The Interviewer' where the main character (Thomas) is silent but his expression reveals that he is displeased with something because he is pursing his lips. A possible audio description of this scene could be: "Thomas purses his lips…".

Fig. 2. A scene of 'The Interviewer' and its corresponding audio description [24]

In this context, the audio description production for movies and TV programs follows several specific sequential steps. Based on relevant references in this field [7, 25–27], the authors of the paper identify four main steps, which are described below:

1. Study and Script Creation: A professional audio descriptor studies the audiovisual piece to be described and produces a script with the text to be narrated, which follows specific guidelines. The most common guideline is inserting audio description excerpts into pauses in dialogues (if it is possible).
2. Tests and Adjustments: After the script conclusion, the audio descriptor should test the descriptions positions in the previously chosen locations. In addition, time adjustments and/or vocabulary replacement are also made.
3. Recording: At this stage, the audio descriptor comes into a studio with the recording director and a technician to perform the recording of the script descriptions.
4. Synchronization/Mixing: The recorded audio file is edited and associated to the original soundtrack of the movie or program in a new audio file, or in a specific audio channel.

4.2 Comparison Table

The comparison table was prepared taking into account the four main steps to produce audio description for TV: Study and Script Creation; Tests and Adjustments; Recording; and Synchronization/Mixing. To analyze these four steps and establish a correlation between the proposed voluntary approach and professional AD, different procedures within each step were identified. The Table 1 compares professional AD and the proposed voluntary approach according to the AD creation process for TV.

With the analysis of the comparison table, it was possible to verify that the creation process of the proposed voluntary approach is quite different from the production method of professional audio description.

Regarding the first step 'Study and Script Creation', the voluntary approach differs from the professional method in the form of elaborating AD, because the voluntary approach has no script and AD creation is only based on the direct understanding of the narrative by the volunteer. Concerning the second step 'Tests and Adjustments', the main difference between the two methods is the fact that in the professional AD, the audio describer can make tests and changes in the AD segments, but in the voluntary approach, the volunteer has no physical support to make any kind of changes. Considering the 'Recording' step, in the professional AD, the audio describer records audio description in a meticulous way, supported by the script and with the help of other professionals. On the other hand, in the voluntary approach, the volunteer records audio description in real-time and singlehanded. Regarding the last step 'Synchronization and Mixing', the main difference between the two methods is the fact that in the voluntary approach the volunteer has no access to the final audio file, contrary to what happens in the professional method, since the audio describer has the possibility to make a final edition in the created AD file. Besides that, in the professional AD, the audio describer has no responsibilities in the association of the AD file to the TV program; however, in the voluntary approach, the volunteer should perform the AD file uploading to make the association.

Table 1. Comparison between professional AD and the proposed voluntary approach

AD production steps for TV	Procedures	Professional AD	Voluntary approach
1. Study and script creation	Movie study	The audio describer has the possibility to view and study the entire movie	The volunteer has the possibility to view the entire movie before creating AD if he wants
	Script writing	The audio describer elaborates a script that will guide him during AD	The volunteer creates AD based on his direct understanding of the narrative
	Pauses identification	The audio describer identifies the pauses to adjust AD content to them	The volunteer can identify the pauses only while he is creating AD
2. Tests and adjustments	Position testing	The audio describer verifies if the position of AD segments is correct	The volunteer can verify if the AD segment overlaps with the original soundtrack only after recording
	Time adjustments	The audio describer can adjust AD times according to tests	n/a
	Text adjustments	The audio describer can adjust AD texts according to tests	n/a
3. Recording	recording	The audio describer records the AD in a studio	The volunteer records the AD in real-time and in a domestic environment
	Recording control	The audio describer has the help of the studio director and a technician	The volunteer records the AD without assistance
4. Synchronization and mixing	Final edition	The audio describer makes a final edition on the AD file	The volunteer can repeat the recording of each AD segments if he wants
	Association to TV program	The AD association to TV program is made by a technician	The volunteer makes the AD association to TV program through web uploading

4.3 Identification of the Functional Requirements

The findings obtained from the analysis of the comparison table enabled the identification of the functional requirements of the platform that will support the voluntary approach for AD creation. These requirements were categorize based on the procedures involved in the production of audio description for TV and are following described.

- Movie study:

The volunteer has access to the moments that should be audio described and, if he wants, he has the possibility to view the entire movie before creating AD. So, the platform should provide the user with the possibility of watching the preceding TV content of these moments and also the entire movie. The duration of the precedence should be variable depending on the user's level of knowledge about the movie. Besides that, the user should be informed about the number of segments to be described and the segment where the user is.

- Script writing:

As the volunteer has no access to any script, he creates AD segments based on his direct understanding of the narrative. Thus, the platform should include tips on how to create helpful audio descriptions in a specific section.

- Pauses identification:

As the platform automatically identifies the favorable moments for inserting the AD segments, the volunteer can recognize the pauses only while he is creating AD. In this way, the platform should inform the user about the recommended duration of the AD segments. Besides that, the platform should provide the user with the possibility of skipping the segments that he thinks do not need AD.

- Position testing:

As mentioned in the previous point, the platform automatically identifies the moments for inserting AD. Therefore, the volunteer can verify if the AD segment overlaps with the original soundtrack only after recording. For this reason, the platform should inform the user about when he should start and end the AD segments recording.

- Time and Text adjustments:

The volunteer cannot directly adjust AD times, because this recognition is done by the platform. The volunteer cannot also adjust AD texts, because there is no script. The platform should provide the user with the possibility to record again the AD segment.

- Recording:

The volunteer records the AD segments in real-time and in a domestic environment. Thus, the platform should clearly inform the user when is necessary to start and end an AD segment recording, for example with a strategy of counting down. The user should also be informed during the process that the recording is being made.

- Recording control:

As the volunteer records the AD singlehanded, the strategy of include tips on how to create helpful audio descriptions should be used not only in a specific section but also during the recording process without disturbing the user.

- Final edition:

The volunteer does not have access to the AD file and cannot make a final edition of the file. However, the user should have the possibility to view the final result and repeat any of the segments.

- Association to TV program

The volunteer makes the AD association to TV program through web upload. Before making the association, the user should be informed about how many segments he recorded and how many segments he skipped. Besides that, when the upload is complete, the user should be notified.

5 Conclusions and Future Work

The info-inclusion of people with disabilities is becoming a reality. However, it is necessary to study and develop more services and tools that allow all citizens to participate actively and autonomously in society. This problem is particularly critical in usage scenarios involving mass media like Television (TV), specially taking in consideration its audiovisual format (which involves image, sound and text) that are not perceptible by many of viewers with special needs, such as visually impaired persons.

The comparative study described in this paper, allowed us to identify and understand the functional requirements of the platform for the AD creation. Besides that, the researchers can confirm that the proposed voluntary AD production approach is a suitable solution for the accessibility to audiovisual content for visually impaired viewers, because it could be an alternative to the method of professional AD production.

From the presented results, we are now able to extend this research with an additional study about the functional requirements that brought up with the study presented in this paper. The authors are conducting a study with a low-fidelity prototype, which is being tested with potential volunteers, enabling the identification and definition of the final functionalities inherent to the proposed model. In the next phase, we will prototype the components of the proposed model, in order to test and validate the voluntary audio description technique with volunteers and consumers.

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