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The Development of a Framework for Understanding the UX of Subtitles

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ABSTRACT

Approximately 10% of the television audience use subtitles (captioning) to support their viewing experience. Subtitles enable viewers to participate in an experience that is often taken for granted by the general audience. However, when reviewing subtitle literature, it is uncommon to find work that examines the user experience of subtitle users.

This paper presents work on the development of a framework analysing the user experience of watching subtitled content. The framework is introduced, its usage discussed, and the overall framework is then reflected on.

Categories and Subject Descriptors

• **Human-centered computing** ~ **Accessibility design and evaluation methods**

General Terms

Measurement, Design, Experimentation, Human Factors.

1. INTRODUCTION

The framework presented in this paper encourages research that can improve the overall viewing experience associated with subtitle viewing. This requires a shift in defining what is meant by the quality of subtitles; from the quality of subtitle displays as defined principally by standard efficiency measures - to the quality of the overall viewing experience. Subtitle quality is not reducible to the subtitle display per se; it is a systematic and measured outcome of the quality of the overall viewing experience, capturing the relationship between the person, the subtitles, the content, device, and context.

User experience is a highly subjective field, focusing on the benefits that a user may derive from a product. Existing measures for evaluating subtitle quality include subjective measures such as 'enjoyment' [3], typically administered using a Likert scale. This may indicate to what extent a person has enjoyed the subtitled content but it is insufficient in identifying the reasons as to why; it describes a state, rather than seeking to understand and explain.

The implementation of frameworks measuring UX is commonplace. Yet, a literature review failed to identify a UX framework suitable for the analysis of subtitles. However, the sustained interest in systematically measuring subtitled content suggests this area is ripe for further development. This paper presents our initial work in creating a UX framework for subtitles.

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Successful UX frameworks can take years before reaching maturity [5], and as such, this framework is very much a work in progress. This work aims to develop a systematic tool for collecting and analysing data to better understand how people experience subtitled content. It offers a method to evaluate how changes in display affect the overall UX. This is a conscious effort to promote the importance of continued research efforts to ensure equivalence of experience in TV viewing between those viewing with and without subtitles.

2. FRAMEWORK CONCEPTS

The framework for measuring the user experience of subtitles is split into seven key components, all of which are important in understanding the concepts that are part of creating a positive user experience. These concepts, combined, can provide a rich amount of detail, drawing on aspects that have not before been examined in relation to subtitle usage. The 7 concepts that make up this framework are adapted from existing literature and UX frameworks. It was important the concepts used in this framework should be both grounded in academic literature, and also appropriate for the evaluation of subtitles.

Attention is defined as awareness to what is going on in relation to the subtitled video content. Users reporting high levels of attention would be focused heavily on the video content, being able to focus clearly on the subtitled video.

Perceived usability is a measure of the challenge that is faced while engaging with the subtitled video content. Users that report high levels of perceived usability are likely to have found the subtitled content easy to understand.

Perceived usefulness is a measure of how useful the display of the subtitled content is. Users who perceive high levels of usefulness will see high levels of value in the subtitle display.

Aesthetics is a measure of the visual appeal of subtitled content. Users reporting high levels of aesthetics indicate that the content is visually pleasing. Low aesthetic levels indicate that the subtitles are displayed in a manner that is not visually appealing to users.

Endurability is defined as a user's willingness to view subtitled video content using a similar method of subtitle display in the future. Users with high levels of endurability are likely to wish to use this method again.

Familiarity is defined as a measure of how much users feel the current subtitle display is recognisable as what they would expect subtitled content to look like and in line with their expectations.

Involvement is used as a measure of how engaged users are with the subtitled content. Users reporting high levels of involvement would be 'drawn into' the subtitled content and would find this to be an engaging and enjoyable experience.

3. CURRENT USES

While the purpose of this paper is to introduce our framework, it is important to highlight its current position within academic literature. This section outlines our usage of this framework to date, however our future work in this area will also implement the use of this framework.

The positioning of **Subtitles in News Broadcast** within an Internet browser is important due to the current shift in media viewing behaviour. In this work, participants were given a short quantitative questionnaire that was based on the Subtitle UX Framework followed by an unstructured interview, with aspects of the framework being drawn out during analysis[2].

Responsive Subtitles are a concept where the text size of the subtitles behaves similar to that of responsive web design. This concept, introduced in [4], is now being analysed using our framework in order to aid in establishing research themes.

Dynamic Subtitles are a concept where subtitles are placed in dynamic positions in the screen rather than at the bottom of the display. Participants were shown a clip from the popular television show Sherlock, with dynamic subtitles being used. This was followed by a semi-structured interview where participants were asked questions focusing on framework concepts [1].

4. REFLECTIONS ON THE FRAMEWORK

The framework cannot be used as a predictive tool for user experience: The factors identified in the framework are highly interrelated. Results generated provide indications of user experience for future work but it is very difficult to use the framework form as a predictor of UX.

The framework can be used explicitly during studies or as a tool during analysis. The framework was explicitly applied during experimental sessions and implicitly during analysis. Both methods of application generated insights. It was defined and successfully implemented as a data gathering tool and it was also proven to work as also as a qualitative analysis tool.

The framework shows value in using a mixed method approach to research. There are limited multi-method frameworks available for the analysis of UX. We hope this framework provides a dialogue for cross communication. The framework provides the ability to both rate and explain UX. In using the framework so far, we have found that a key benefit is that quantitative results have been complemented by qualitative analysis.

4.1 Reflections on Framework Concepts

The value of each concept is variable: In experiments, participants placed different values on the concepts that were most important to them. This generates insights into subtitle use on an individual basis for each participant. Furthermore, the value of the concepts also varies according to the viewing situation. For example, aesthetics was more of a priority when viewing drama with *dynamic subtitles* then viewing news with subtitles positioned at the bottom of the screen. The display, the content being viewed, and the context of use all have an effect on the UX and therefore on their view of the concepts. This reinforced the idea that one size doesn't fit all for subtitle presentation and usage.

Our understanding of the framework is evolving: We are aware of the close relationships between elements of the framework i.e. usability and usefulness, and attention and involvement. Both of these relationships need to be understood in

more detail in the future. Additionally, investigation also needs to be taken to understand the role of some individual factors. For example; attention was initially used to ascertain what a person was able to focus on while watching the content. However, it generated insights into comprehension as measured by the perception of whether an individual could follow both the subtitles and the visuals.

The framework measures small aspects of properties within an experimental setting. Endurability was difficult to measure in a lab session. It is useful as an indicator of the sustainability of subtitles in the context of long-term use but it cannot accurately determine the reliability of this within short-term lab experiments. However, endurability as a category remains important and may provide more value outside of the lab.

The framework provided a communication bridge: During all of the experiment sessions, participants mirrored the language that was used in the framework. This aided in creating meaningful conversations between researcher and participant. This in turn was useful in focusing discussion onto relevant points while allowing participants to have the freedom to discuss subtitles using a (now) common language

5. CONCLUSIONS

This paper presented a reflection into the creation of a framework to aid in helping to understand the UX that is attached to viewing subtitled content. Again, it is important to note that this framework is very much a work in progress and through its continued usage we will understand more about the concepts that are important in understanding the UX attached to subtitled content. More importantly, this framework addresses a gap that currently exists when analysing the UX of television content, no other frameworks or tools exist that focus on subtitle UX in this way. This framework is a positive move forward in the way that we think about, research, and develop accessible services. It provides a method to go beyond thinking of subtitles as only an access service and towards creating systems that can improve the overall experience of watching subtitled video content.

6. ACKNOWLEDGMENTS

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