

Implications for Designing the User Experience of DVD Menus

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ABSTRACT

DVD menus often miss out on usability and are complex and difficult to navigate through. One of the main problems is the lack of design standards. By conducting an expert walkthrough we identified typical usability issues of DVD menus and verified them with usability testing and a user survey. Our research goal is to develop a set of specific solutions for designing usable DVD menus to improve the overall user experience. As a first step towards this goal we present an initial set of usability issues that are specifically relevant for DVD menu design.

Author Keywords

DVD; DVD menu; user experience; usability; user testing

ACM Classification Keywords

H5.2. [Information interfaces and presentation]: User Interfaces - Screen design; Standardization

INTRODUCTION

Motion pictures have initially been developed for home entertainment at the Edison Company. Yet they first appeared in movie theaters, where watching a movie was a non-interactive, passive experience. When TVs and later on VCRs found their way into our homes this experience suddenly involved interaction. Back then, the devices offered only a very small set of operations and the media (e.g. VHS) was still linear. With the advent of DVDs the user is now faced with a media that allows random access and supports built-in interactivity.

Today, the primary display for watching movie DVDs still is the home TV set with a remote control as input device. Recent studies [1] show that more than 99% of U.S. households have a TV set and 68% have DVD equipment. Only 5% watch DVDs merely on their computers.

Usually, DVDs come with interactive menus for user control. Due to the fact that these menus do not follow any standards users often experience problems using DVDs. This is especially relevant for novice users. This can make

watching a DVD a frustrating experience. As Donald Norman stated, it seems that designers of DVD menus have not learned from previous media and are repeating the mistakes of interactive media design [5]. A common problem with DVD menus is their complex and difficult navigation when using a remote control. Designers often put much more emphasis on visual design than on functional design. This leads to fancy, animated and complex menus, however, for good usability simple control and consistency are much more important.

The usability of DVD menus has barely been mentioned in literature so far. Don Norman states a few problems and the lack of standardization in his article about DVD menu design [5]. Non-scientific publications, such as news articles, weblogs and forum postings also identify DVD specific usability problems. Research work about interactive TV represents another domain from which general issues (e.g. remote control interaction, visual representation) for DVD menu design can be derived. Besides that, there is a lot of standard literature about user interface design which also applies to DVD menus.

IDEA

User expectations are key in DVD menu design in order to make watching DVD a good user experience. One possibility to assure this is to provide design principles or guidelines [6]. These guidelines should be derived from user studies and should cover all relevant issues, from general user interface guidelines to specific DVD features. Guidelines also represent a compelling tool for product development in the face of limited resources. Experts can discover usability problems very quickly using guideline evaluation [3]. For DVD menu design, no specific design guidelines have been developed yet. Every DVD production company seems to have its own standards and guidelines, which leads to various different implementations of DVD menus on the market. This forces users to relearn the menu handling over and over again.

Our study focuses on specific usability issues of DVD menus. The goal of this study is to reveal the problems of current DVD menus and to find solutions that enhance their usability. Our aim is to create an initial set of design principles for designing usable DVD menus.

METHOD

The focus of our evaluation was on investigating movie DVDs, the most common kind of DVDs on the market. We conducted the evaluation in two steps. In the first step (expert walkthrough), usability experts evaluated several DVDs to identify usability problems and design standards. In the second step we conducted usability testing and a user survey to verify the identified issues and to provide recommendations for improvements.

Expert Walkthrough

In three sessions three usability experts evaluated 70 different DVDs to identify usability problems and design standards for DVD menus. The experts found 85 issues and grouped them into twelve categories using card sorting (*Bonus Material, During Movie Playback, Intro, Main Menu, Menu Entry, Menu Structure, Navigation, Picture Gallery, Scene Selection, Settings, Supporting Multimedia, and Wording*). The issues ranged from general consistency problems to very specific solutions (e.g. the best way to implement scene selection). We deliberately omitted the investigation of general issues since they can be found in standard literature about user interface design. For further evaluation we focused on the remaining 44 DVD specific issues.

Usability Test

We recruited 20 voluntary subjects (6 female, 14 male) with an average age of 22.5 years ($SD=2.46$). Thirteen subjects were novice DVD users and seven subjects watched at least one DVD per week (experienced users).

We selected 10 popular movie DVDs¹, which covered all implementations of DVD menu patterns. In other words, the menus of the selected DVDs were very different (e.g. in some DVD menus the language selection menu included language and subtitle settings whereas in other DVD menus these two settings were separated).

We simulated a standard DVD Player using a laptop (Compaq Presario 2800) with a DVD Player Software (Cyberlink PowerDVD 5) executed exclusively in full screen mode. Moreover, a standard PC remote control (ATI Remote Wonder) was used for the tests. Four buttons on the remote control were labeled *Menu, Eject, Audio* and *Subtitle*.

¹ Kill Bill 2 (Buena Vista Home Entertainment), Jerry Maguire (Columbia Tristar Home Video), Run Lola Run (Laser Paradise), Dogma (Kinowelt Home Entertainment), Indiana Jones and the Last Crusade (CIC Video/Paramount Home Entertainment), Ken Park (Legend Films International), Elf (Entertainment in Video), Harry Potter and the Prisoner of Azkaban (Warner Home Video), Big Daddy (Columbia Tristar Home Video), Scary Movie 3 (Buena Vista Home Entertainment).

At the beginning of each test session, every participant received a short introduction on the experiment procedure. During a learning phase, the participants were familiarized with the remote control and on-screen visual feedback of the DVD Player. After the learning phase, the subjects had to accomplish five tasks which covered typical usage patterns.

- Inserting the DVD, selecting English subtitles, and starting the movie playback
- Changing the subtitles during movie playback
- Starting scene 5 of the movie
- Playing back the movie trailer
- Changing to the last scene of the movie during movie playback

We observed the subjects carrying out these tasks with five selected DVDs without providing any additional help. During the tests we recorded usability problems, keystrokes and comments of the participants. Because all tasks had to be accomplished with all DVDs we minimized learning effects by counter balancing the order of the tasks and DVDs in a Latin Square pattern. After each DVD the subjects were asked what they especially liked or disliked about the interface. Finally, after the subjects had accomplished all tasks, questions about preferences concerning the implementation patterns were asked.

User Survey

With the help of usability testing we obtained qualitative data. We decided that quantitative data should be taken into account as well when evaluating the usability of DVD menus. Therefore we set up an online questionnaire in English to obtain quantitative data about wording and menu structure preferences. To reach experienced DVD users, we invited users of several DVD portal sites and mailing lists to take part in our survey.

We finally got $n=350$ people, who answered the questionnaire. Seventy-seven percent of the respondents were male and 23% female with a mean age of 28.16 ($SD=7.76$) years. Thirty-one percent of the participants were native English speakers, 35% had at least advanced and 27% upper intermediate English speaking skills. 64% watched DVDs at least once a week (experienced users) and 46% had 25 or more DVDs in their collection.

RESULTS AND DISCUSSION

During the expert evaluation we found 85 usability problems and derived solutions which are important for the user experience of DVDs. Forty-one of these issues correspond to general design guidelines for usable interfaces. The usability tests showed that these issues are also highly relevant and need to be considered when designing DVD menus. They include guidelines for consistency, feedback, use of color and wording. These general solutions have to be taken into account when developing guidelines for DVD menu design, but will not be included in our initial results.

We grouped the remaining 44 usability issues into the more general categories *intro and transitions*, *menus*, *scene selection*, *remote control* and *extending the user experience*. In the following sections, the results from all three methods are discussed for each category. The statistical evaluation of the questionnaire does not show any significant differences regarding level of experience or language skills.

Intro and Transitions

It should be possible to skip the entire intro sequence as well as every other transition by pushing the menu or next button on the remote control. Transitions that support menu navigation should be kept short. During the user test, all but two subjects expressed their annoyance about long “unskipable” sequences. Some respondents expressed their dislike of enforced adverts at the start of DVDs. They commented that while on video tape it is always possible to fast-forward through them, some DVDs do not allow this option.

The results of the questionnaire show that 83% of the respondents prefer to initially enter the main menu rather than start with the movie.

Menus

The main level menu should be constrained to the following items (numbers in brackets represent the percentage of respondents who demanded this item): *Play Movie* (97%), *Language Selection* (83%), *Subtitles* (61%), *Scene Selection* (80%) and *Bonus Material* (77%). These terms also represent order and label captions that should be used for an English menu. The majority of the respondents did not favor *Trailers*, *Picture Gallery* and other options to be in the main menu.

Ninety-one percent of the users want the *Play Movie* element to be the first element in the main menu and to be preselected. If the main menu is entered during movie playback, this menu item should resume the movie at the last position. This was verified by the usability test and also reaffirms using *Play Movie* as label instead of *Start Movie*.

On the one hand, the questionnaire showed that subtitles and menu selection should be presented in one (68%) rather than in two (27%) submenus. On the other hand, users reported that language and subtitles selection is often made by remote control and not via the menu. The labeling of the menu is difficult to determine. The reason for this is that *Language Selection* (preferred by 27% of the respondents) or *Languages* (20%) does not mean *Audio Settings* (22%) or *Audio Selection* (11%) and vice versa. Therefore, the actual label depends on what really is available in this menu (e.g. language, subtitles or surround standard). According to the user tests, there is no difference in usability if *Subtitles* are placed directly in the main menu or in the *Language and Audio Selection* submenu.

Our questionnaire showed that 75% expected the *Director's Commentary* menu entry to be presented in the bonus material menu and not in the language selection menu.

A study from Zaphiris and Mtei (1997) [7] about the depth of hierarchical menus shows that the mean task time in accessing specific information is proportional to the depth of the tree structure menu. The study was conducted for web design; however, these results can be adopted for DVD menus. According to this study the hierarchy should be constrained to two levels, except for the bonus material, which requires three levels. Furthermore, all items of one menu should be kept on one page. There should be a clear indication if a second page is used. The user tests showed that subjects had problems navigating to a second page when the label to the second page was not clearly presented.

All menus should be arranged in a line or grid. The usability tests showed that the subjects had problems with arbitrarily arranged menus. Besides that, menu items should not be animated. All but five subjects had problems reading animated items.

If a menu allows the selection of one or more options, the selection that has been made should be visible to the user. The selection should also remain visible after returning to the submenu. One subject had serious problems with selecting language and subtitles because it was not obvious which item was selected and the selection was not shown when reentering the settings.

Scene Selection

The questionnaires showed that a movie of standard length should be divided into approximately 20 chapters. The majority of the respondents (67%) favored at least four and not more than six scenes on one page in the scene selection menu.

If transitions between scene selection pages are used they should be as short as possible and disguise “seamy” breaks. The user tests showed that the subjects were irritated by long transitions especially in the scene selection menu and tried to skip them.

All subjects performing the user test used the scene index to navigate through the scenes. This index for fast selection should be provided. Moreover, the currently selected scene block should be visually highlighted in this index.

The subjects expected the navigation through the scenes to be sequentially with a clear mapping to the remote control. Therefore, scenes should be arranged in a grid and support sequential navigation through all scenes as well as across pages. Each scene should be represented visually by a video or a descriptive image. This was identified as a standard during the expert walkthrough.

Remote Control

The usability of DVD menus is highly connected to the usability of remote controls in general. Usability problems of standard remote controls have been discussed elsewhere [2, 4]. For this reason it is not our goal to discuss usability issues of remote controls. Furthermore, we assume that the remote control will remain the main interaction device for home entertainment appliances.

The mapping between the navigation keys on the remote control and the menu should be clear. Additionally, every menu item should be selectable sequentially with only one navigation key. Every navigation operation should also be reversible. Observation of the subjects during the user tests showed that they had problems navigating through menus that did not implement these principles.

Remote control keys, such as *menu*, *language* and *subtitles* should also be available and supported during movie playback. All subjects used these buttons extensively on their own accord during the user tests.

Extending the User Experience

The solutions from this section are not directly related to usability issues but help improving the overall user experience of DVD menus. Their significance was proven in both the usability tests and the questionnaires. The results in this section are based on the pre-test interviews and the comments from the questionnaires.

The menu design should match the movie and incorporate characteristic elements. Menus should also contain some background animation and music. Both should not distract from menu navigation. Background music should be without a noticeable transition if repeated. Transitions between menus extend the user experience and therefore should be used appropriately.

The DVD should contain bonus material. According to our questionnaire, the preferred kinds of bonus material (in descending order) are: *Making Of* (78%), *Deleted Scenes* (78%), *Alternate Ending* (64%), *Interviews* (55%), *Director's Commentary* (52%) and *Theatrical Trailer* (34%).

Generally, the quality of audio and video should be maximized. This also includes subtitles to be selectable and not fixed with the video stream.

CONCLUSION AND FUTURE WORK

We identified general and specific usability problems of DVD menus. Based on these issues, we derived recommendations for designing usable DVD menus. Our results are grouped into five categories, namely intro and transitions, menus, scene selection, remote control and extending the user experience. Taking our results into account will improve the user experience of DVD menus.

Our research work also represents a valuable input for specifications of future interactive TV systems where usability issues related to TV and remote control interaction are also highly relevant.

As a next step, a more comprehensive set of design guidelines (including general user interface design issues) should be developed. The objective of these guidelines is to allow efficient design and evaluation of usable DVD menus. As a further step, it is also necessary to test the guidelines in a DVD menu development process. In order to assure that the guidelines can be used for a wide range of DVDs, other types such as series or music DVDs have to be examined as well. Additionally, it is important to consider needs of special user groups, such as older adults, children or users with special needs.

Such guidelines (and also our results) should not have any negative or constraining impact on the creativity of DVD menu designers but guarantee a good user experience of DVD menus.

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