
Developing User Interface Guidelines for DVD Menus

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Abstract

Watching DVDs can be a frustrating experience, because DVD menus often miss out on usability and are complex and difficult to navigate through. Similar to the early years of web development, there is a lack of design standards. In this paper, we show the development of user interface guidelines for DVD menus. These guidelines can be used to design and evaluate DVD menus. We built a prototype according to the guidelines, conducted usability tests with the prototype and evaluated other movie DVDs using the guidelines to show the applicability, utility and usability of the guidelines.

Keywords

DVD menu, user interface guidelines, design, usability

ACM Classification Keywords

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

Problem Statement

For a recent project we had to design and evaluate different DVD menus. Many problems arise, when developing a DVD menu, concerning usability issues as well as the technological implementation. The report at hand discusses the process of developing DVD-specific guidelines. Before we started we informally investigated popular movie DVDs. The investigation revealed

numerous inconsistencies among different DVD menus, both in design and interaction, and a couple of serious usability problems. This observation inspired us to formally investigate the usability problems of current DVD menus and formulate possible solutions.

Usability inadequacies of DVD menus obviously represent a serious concern, becoming even more important as the number of DVDs on the market is increasing. A recent study dated 2005 showed that 75% of all U.S. households already have a DVD player [6]. Especially people from non-English speaking countries often have to change settings (e.g. language and subtitles) when watching a DVD and therefore experience usability problems on a regular basis. (Except for expert users, who use short cut buttons on the remote control, such as “language”.) DVDs often feature unintuitive and cluttered menus that make navigation difficult. Furthermore, inconsistencies between different DVD menus make skill transfer impossible.

The main reason for the usability problems and inconsistencies in DVD menu control is the lack of design standards: they simply do not exist [5], just like in the early years of the Internet, when everybody started designing web pages without following any standards or User Interface (UI) guidelines. To assure a certain level of quality for DVD menus it is therefore necessary to develop DVD-specific guidelines.

Challenge

DVD menus are different from traditional computer interfaces, such as software products or web pages. Furthermore, DVD users do not necessarily have any computer experience. This means that they might not

be familiar with concepts, such as menus or buttons. User interaction with DVD menus is also very different to interacting with a software or web page (in case the DVD is viewed on a stand-alone player or console). Designers of DVD menus have to keep in mind that remote controls typically only provide four directional buttons for navigating instead of a pointing device.

An additional challenge we had to face was the necessity for a methodology for developing UI guidelines. While many guidelines for different domains have been published, there is little information available about the methodology for developing guidelines. Only a few research projects have addressed this problem so far (e.g. [1, 3]). However, these approaches are either too specific or too complex for our purpose and therefore not applicable for our project.

Solution Summary

For our goal to implement a usable DVD menu, we had to go through three phases, gathering, formulating the guidelines, and improving. The first phase included a literature review, an expert walkthrough and a user study. The literature review did not provide much output, as there are only reports and no scientific literature about this topic available. However, the literature review resulted in eighteen issues. The expert walkthrough was more successful and after examining 70 different DVDs we obtained 85 issues. To complete the gathering phase we conducted a user study. This study included a user test and a questionnaire for getting both qualitative and quantitative data. Including the results from the user study the gathering phase resulted in an initial set of usability issues. The next step was formulating the guidelines. The results were

44 guidelines each confirmed by at least two different methods. The improving phase was started with card sorting for structuring the guidelines. The results were eight categories. We subsequently implemented a prototype for testing the applicability of the guidelines and the technical feasibility. Finally this prototype was subject to a usability test, which resulted in some minor changes of the guidelines. The guidelines were handed out to ten groups of students who conducted a heuristic evaluation. From this we received feedback that was incorporated into the guidelines. The complete set of UI guidelines for DVD menus can be found in [7].

Solution Details

Throughout our project we used several different usability evaluation methods, which we structured into three phases – gathering, formulating the guidelines, and improving. This section discusses the methods used and gives insight to the results obtained. Further details about the gathering phase can be found in [4].

Gathering Phase

During the gathering phase we basically collected relevant usability issues.

A *literature review* represents a good method for building a solid foundation of guidelines. There was no scientific literature available that concerned DVD menu design at the time we carried out this project. Instead, we found a few reports about DVD menus on the web that also discussed usability issues (e.g. [2, 5]). Eighteen issues were derived from these reports. For example one author discusses the number of items that should be displayed on one page [2]. Too many items lead to clutter, but at the same time too many layers of hierarchies make the navigation more difficult.

In an *expert walkthrough* three usability experts examined 70 different movie DVDs to identify main problems when navigating through DVD menus. They compared different implementations of DVD menus according to their usability and also tried to identify standards, such as wording. The expert walkthrough proved to be a low-cost and efficient method for collecting usability issues. We obtained 85 issues with this method. Many of these issues concerned navigation through the scene selection and navigation aspects in general. Another group of issues addressed the user experience design of DVD menus, such as animation and background music.

To reflect the knowledge and experience of users we conducted a *user study*. This is an important point since they will be the ones who have to use the product in the end. To collect both, quantitative and qualitative data, we decided to conduct a usability test and a survey.

For the usability test we recruited 20 subjects. Their DVD experience ranged from basic to expert. Each subject had to accomplish a predefined set of tasks on 10 movie DVDs. The test showed that expert users did not experience any serious problems, while novice and intermediate users had some difficulties to accomplish all tasks on some DVDs. A closer examination and the analysis of the post-test interviews revealed the issues that caused the problems. Most usability problems were connected to the chapter selection. Users expected the navigation through the scenes to be sequentially and a clear mapping of the remote control to the menu navigation. However, many DVD menus violate this guideline and users tend to get lost within this submenu. Furthermore, the subjects had the possibility

to express their personal opinions in these post-test interviews. A common source of annoyance represented long “unskippable” sequences. Overall we gathered 43 issues with this method.

For the survey we set up an online questionnaire to obtain results about wording and menu structure preferences. We also included open questions to obtain opinions and ideas for improvement from users. The target group for the questionnaire consisted of experienced users. Hence, we invited users of several DVD portal sites and mailing lists to take part in our survey. We received 350 replies from the questionnaire. One issue that was derived from the survey regarded the menus that should be directly accessible from the main menu. The results suggested to limit the items to: *play movie*, *language selection*, *subtitles*, *scene selection*, and *bonus material*. We also obtained suggestions for specific numbers, e.g. a movie of standard length should be divided into approximately 20 chapters and at least four and not more than six chapters should be grouped on one page. The total number of issues that were derived from the questionnaire was twelve.

Formulating the Guidelines

The methods described above provided us with a sufficient set of issues to formulate an initial set of guidelines. A number of issues related to standard UI problems. We assume that UI or graphic designers, who are familiar with general UI design guidelines, typically develop DVD menus. Therefore we did not investigate these issues any further.

Each of the remaining 44 issues was confirmed through at least two different methods by the end of this phase.

Name: Grouping of scenes
Short description: If more than six scenes are provided on a DVD, split them into groups of four to six.
Detailed description: Many DVDs contain more than six scenes. In this case displaying all scenes on one screen would lead to a cluttered screen. Therefore the DVD should provide multiple pages, each containing four to six scenes. Four and five scenes on one page should be aligned in a line, four and six in a grid.
Example: A DVD features 20 scenes. Therefore five pages containing four scenes each should be provided for scene selection. The scenes are aligned in a grid of two by two.
Severity: ★★★★★ (4/5)
Origin: Expert walkthrough, questionnaire
Name: Audio commentaries
Short description: Place the audio commentaries into the bonus material menu.
Detailed description: Some DVDs present the audio commentaries in the language selection menu, some in the bonus material menu. For the purpose of consistency and to support most users' mental model the commentaries should always be placed in the bonus material menu.
Example: A DVD features two versions of director's commentaries. Both should be placed in the bonus menu.
Severity: ★★★★★ (3/5)
Origin: Expert walkthrough, questionnaire
Name: Visibility of settings
Short description: If a menu allows the selection of one or more options, make all selections visible to the user.
Detailed description: It is not enough to highlight the currently active item in setting menus. The item or items that have previously been selected should also be highlighted, in a way that allows a distinction to the currently active item.
Example: A DVD provides one menu for both, language and subtitle selection. The previously selected language and subtitles should be highlighted when entering the menu.
Severity: ★★★★★ (5/5)
Origin: Expert walkthrough, usability tests

Table 1. Examples for DVD guidelines

The severity of the results obtained from the usability test was assigned according to the number of subjects who encountered the corresponding usability problem. To obtain an initial set of guidelines, we completed the issue descriptions by a more detailed description, an example scenario, a severity rate, and the list of origins. For some guidelines we also added illustrations for better comprehensibility. Table 1 shows three examples for DVD-specific UI guidelines.

Improving Phase

We concluded with an improving phase, where we evaluated and improved the guidelines that we obtained from the first two phases.

The guidelines needed to be structured, as it is difficult to apply a set of unordered guidelines. *Card sorting* provided a low-cost technique for getting a usable structure. Five users with experience in UI design were asked to group the guidelines. The results were eight categories: *Introduction, Main Menu, Menus, Navigation, Movie, Settings, Scene Selection, and Bonus*.

Having a structured set of guidelines does not imply that they are applicable. For that reason we implemented a prototype according to the set of guidelines. By applying the guidelines we did not only test the applicability but also the technical feasibility. We found out that some features like showing the respective current settings in the main menu is a difficult task, as the number of menus is limited to 10,000 and every combination represents a single menu. Furthermore acoustic feedback poses a challenge since it is only possible to play one audio track per menu. There are many more limitations one

has to face when implementing a DVD menu. This should also motivate hardware designers to redesign DVD players and get rid of those limitations as they restrain the usability possibilities.

The prototype was subject to a usability test. The goal of this test was on the one hand to see if the application of the guidelines made a difference and on the other hand if there was still need for improvement. We had 12 participants for this test. The results were extremely satisfactory as the participants did not encounter any major difficulties. Two less experienced users tried to find the audio commentary in the language settings, which was actually located in the bonus material menu. However, the other users did not hesitate and immediately selected the bonus material. Three users experienced problems in the scene selection. This menu included an index for quick navigation, which was not associated with the pictures of the scenes above. This result shows that it is necessary to attach the numbers of the scenes to the pictures. Otherwise the participants did not face any problems while navigating through the menu.

For using the guidelines to evaluate DVD menus, we evaluated the comprehensibility and applicability by handing them out to ten student groups in our usability engineering class. They evaluated 30 different common movie DVDs using heuristic evaluation and also wrote a lot of feedback regarding the guidelines. Much feedback concerned providing better navigation through the document (e.g. using an index or references) and offering more general information (e.g. definition of terms and remote control features). Whether putting the language and subtitles selection in one or two submenus became nearly a philosophic question.

Taking a look at our studies we concluded that both solutions are good, if they are well implemented. There were many minor adjustments that led us to improve the guidelines.

Discussion and Conclusion

Guidelines are helpful tools when designing interactive products and for improving the value of a product for the customer. For example the success of a website depends largely on its usability. If customers cannot find their way they will leave the site without buying anything. With DVDs it is not quite the same, as the customer buys the product without knowing about the usability of the DVD menu. Furthermore the menu is not the determining factor for choosing a DVD. Nevertheless usability inadequacies in DVD menus can make watching a DVD a frustrating instead of an enjoying experience.

When developing the guidelines we focused on movie DVDs. Menus of music or TV series DVDs for example contain different items, wordings and menu structure which are similar but not completely comparable to movie DVDs. For future work we would like to extend our set of guidelines taking these issues into account. The approach we used does not claim to obtain a complete set of guidelines. However, prototyping and the final usability test proved that the guidelines are applicable and improve the usability.

Even though we developed guidelines specifically for DVD menu design the three phases are applicable to other areas as well. Especially in our case the literature review did not yield many results, however the expert walkthrough and the usability test were more effective. Despite the fact that the amount of results from the

specific methods used will vary in the different areas, the final result will always be a proven set of UI guidelines that can be easily applied. We would like to see the application of our approach in other domains e.g. headsets, digital audio players, car keys, hand scanners, etc.

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References

- [1] Beier, B., Vaughan, M.W. The bull's-eye: A framework for web application user interface design guidelines. *Proc. CHI 2003*, ACM Press (2003), 489-496.
- [2] De Lancie, P. Post Linear: Menu Design for DVD. http://millimeter.com/ar/video_post_linear_menu/
- [3] Henninger, S. A Framework for Developing Experience-Based Usability Guidelines. *Proc. DIS 1995*, ACM Press (1995), 43-53.
- [4] Költringer, T., Tomitsch, M., Kappel, K., Kalbeck, D., Grechenig, T. Implications for Designing the User Experience of DVD Menus. *Ext. Abstracts CHI 2005*, ACM Press (2005), 1565-1568.
- [5] Norman, D.A. DVD Menu Design: The Failures of Web Design Recreated Yet Again. <http://www.useit.com/alertbox/20011209.html>
- [6] Parks Associates <http://blogs.zdnet.com/ITFacts/?p=9>
- [7] Tomitsch, M., Költringer, T., Kappel, K., Grechenig, T. DVD Menu User Interface Guidelines. Technical Report RISE-01/06, Research Industrial Software Engineering (RISE), Schwechat, Austria (2006).