

Guidelines for Designing Usable DVD Menus

Thomas Költringer, Martin Tomitsch, Karin Kappel, Thomas Grechenig
Research Group for Industrial Software (INSO), Vienna University of Technology
Wiedner Hauptstrasse 76/2/2. 1040 Vienna, Austria
{thomas.koeltringer, martin.tomitsch, karin.kappel, thomas.grechenig}@inso.tuwien.ac.at

DVD menus often suffer from serious usability problems, which has a negative impact on the user experience. The reason for this is that there is a lack of design standards. In this paper we describe the development of user interface guidelines for DVD menus and present the final guidelines. In order to obtain usable and applicable guidelines we went through three phases, which included among other usability-engineering methods an expert walkthrough, a user study, and card sorting, as well as building a prototype, and validating and improving the guidelines.

Keywords: Design methodology, user interface guidelines, DVD menus.

1. INTRODUCTION

Usability inadequacies of DVD menus often cause frustration and therefore have a negative impact on the user experience: a fact that is becoming even more important as the number of DVDs on the market is increasing. Users expect to have a good experience (quick and easy to operate, skill transfer between DVDs should be possible, nice introduction to the movie) when handling the DVD menu. However, 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 [7], 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 UI guidelines.

UI Guidelines can be used for both, designing a UI and evaluating an existing application in terms of usability. Designing UIs is a difficult and time-consuming task [6]. It is certainly true, that theories and guidelines are not sufficient, and that the quality of a user interface depends largely on the skills of the designer [6]. Tetzlaff & Schwartz have also revealed shortcomings and disadvantages of guidelines [9]. Yet, evidence shows that well-developed UI guidelines provide reference and guidance during the design process [2]. Furthermore, the adoption of guidelines can reduce the number of iterations of the interface development process [2].

2. MOTIVATION

Designers of DVD menus have to face many DVD-specific design challenges, concerning usability issues as well as the technological implementation. 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. They might not be familiar with traditional concepts, such as menus or buttons. User interaction with DVD menus is also very different to interacting with software or a web page (in case the DVD is viewed on a stand-alone player or console). Designers also have to keep in mind that remote controls typically provide a 4-way navigation with special buttons (menu, submenu, language, subtitles, angle, etc.) instead of a pointing device.

3. DEVELOPING THE GUIDELINES

The development of UI guidelines is a process that requires both, experience and extensive application of various usability-engineering methods. To ensure that the final guidelines will be applicable and improve the quality of the product, it is necessary to include different stakeholders (Users, Designers, Developers) during the development process. We therefore defined a framework consisting of three main phases that would help us to guarantee these goals. The methods used and results gained during the different phases will be elaborated in this section. Further details about the first phase and insights into the development process have previously been published elsewhere [4, 5].

Literature Review, Expert Walkthrough and initial User Study

We started with a *literature review*, which represents a good method for building a solid foundation of guidelines. Although there was no scientific literature available concerning DVD menu design, we found some articles on the

Web [1, 7]. In addition, we reviewed discussion forums and weblog entries that also discussed usability issues of DVD menus. Other available literature only concerns technical aspects of DVD menu design.

During the *expert walkthrough* three usability experts investigated 70 different DVDs. The goal was to identify the main problems when navigating through DVD menus and to discover standards such as structure or wording. We obtained 85 issues with the expert walkthrough. The issues ranged from general consistency problems to very specific solutions. One group of issues concerning navigation turned out to be very important. Another set of issues, including animations and background music addressed the user experience.

To reflect the knowledge and experience of users we concluded the first phase with a user study. To collect both quantitative and qualitative data in the user study, we decided to conduct a usability test and a survey. For the *usability test* we recruited 20 subjects (6 female, 14 male) with an average age of 22.5 years (SD=2.46). Four subjects watched DVDs weekly (expert), nine monthly (intermediate user) and seven were novice users with little or no experience (light user). We selected 10 movie DVDs with different types of DVD menu implementations. The test consisted of five tasks that all subjects had to carry out (e.g. select English subtitles; select director's commentary; select a certain chapter). These tasks covered the typical usage pattern of DVDs. Expert users did not experience any serious problems, mainly because of intensive shortcut button usage. However, when accomplishing the tasks major problems arose for novice and intermediate users. The inconsistencies concerning the scene selection between the different DVDs caused the most difficulties. The subjects expected the navigation through the scenes to be sequential, which was not always the case. Furthermore, the mapping of the remote control to the menu navigation was not clear to the users. Another problem was the distribution of menu entries on several pages, e.g. the separation of languages on two pages in the language selection. Also, arbitrarily arranged menu items posed a problem for the subjects. During the post-test interview the subjects expressed their annoyance about long 'unskippable' intro sequences and transitions between menus. Especially the scene selection menu often includes long and annoying transitions. Overall, the user test resulted in 43 issues.

For the *survey* we set up an online questionnaire by which we wanted to collect solutions for specific questions of interest, such as wording, menu structure preferences, etc. We included open questions as well to obtain opinions and ideas for improvement from users. The target group for the questionnaire consisted only 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 (23% female, 77% male) with an average age of 28.16 (SD=7.76) years from the questionnaire. Sixty-four percent watched DVDs at least once a week (experienced users) and 46% had 25 or more DVDs in their collection. We analyzed the data from the questionnaires to obtain usable and comprehensible solutions for wording, alignment of menu items, number of scenes, preferred bonus material, etc. One issue we extracted from the results was the limitation of items in the main menu to *play movie*, *language selection*, *subtitles*, *scene selection*, and *bonus material*. Another result concerning the scene selection yielded that a movie of standard length should be divided into approximately 20 scenes and at least four, but at the most six scenes should be grouped on one page. We concluded the most interesting result is, that bonus material seems to be important for the decision of buying DVDs, but bonus material is watched very rarely. The questionnaire delivered twelve more issues.

Buidling and Sorting the Guidelines

After sorting and reviewing all the issues we derived 44 guidelines for DVD menu design (see Table 1 for the short description of the guidelines). The detailed compilation of our guidelines can be found in [10]. Each Guideline was confirmed by at least two different methods used in the first phase. We also added a detailed description, an example scenario, and a priority as well as a statement about the origin, in order to receive simple, meaningful and descriptive guidelines. The priority of the results obtained from the usability tests was assigned according to the

Short description	Arrange scenes either in a line or in a grid.
Detailed description	The scene previews should be aligned either in a line (horizontal or vertical) or in a grid. This ensures better mapping between the navigation buttons on the remote control and the scene layout.
Example	Six scenes are displayed on one page of the scene selection menu. They are arranged in a grid of three by two.
Priority	★★★★☆ (4/5)
Origin	Expert walkthrough, usability tests
Reference	3.2 (Menu Alignment), 4.1 (Clear Mapping), 7.7 (Grouping of Scenes)

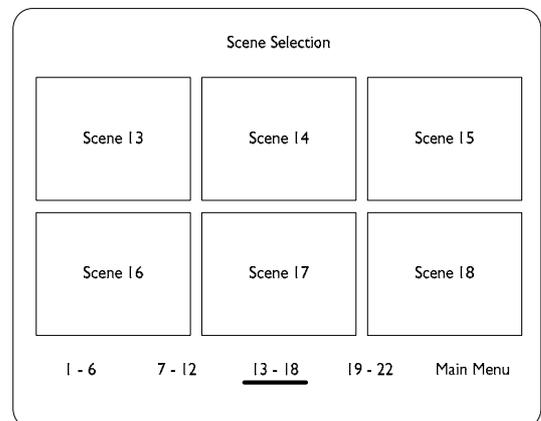


FIGURE 1: Guideline and illustration for the arrangement of scene previews (example)

Introduction	Movie
Keep the entire intro sequence short	Support the Menu button during movie playback
Make all intro sequences skippable	Support 'short-cut' buttons during movie playback
Provide a menu for DVD menu language selection and possibly aspect ratio	Allow resuming the movie via the Play Movie item
Main Menu	Settings
Constrain the main menu to the following items: Play Movie, Language Selection, Subtitles, Scene Selection, and Bonus Material	Provide either two separate menus for language and subtitles selection or combine them both in one menu
Use the following labels for common items: Play Movie, Language Selection, Subtitles, Scene Selection, and Bonus Material	Keep all subtitles on one page
Put the initial focus of the main menu on Play Movie	Do not automatically resume the movie after changing a setting in the menu
Place the Play Movie item first (left topmost)	
Include the movie title or other characteristic elements in the background picture of the main menu	Scene Selection
Avoid non-descriptive text on a menu's background picture	Divide a movie of standard length into approximately 20 scenes and provide significant entrance points
	Provide a scene index for quick page navigation
Menus	Highlight the currently active scene block in the scene index
Provide a maximum of only three levels of hierarchy	Arrange scenes either in a line or in a grid
Align all menu items in a line or in a grid	Allow sequential navigation through all scene previews
If a menu allows the selection of one or more options, make all selections visible to the user	Support cycling through all scene previews
Show the selected option for menu entries where multiple option selection is possible	If more than six scenes are provided on a DVD, split them into groups of four to six
Set the focus on the corresponding menu item after returning from a submenu	Do not display any other menu items or elements between the scene previews on one page
Use a menu design that matches the movie	Provide characteristic pictures or videos for the scenes in the scene selection menu, as well as the number of the scene
Try to group all menu items on one single page. If not possible, indicate clearly that there is another page for that menu	Avoid transitions between pages in the scene menu or make them skippable
Do not animate menu items	
	Bonus
Navigation	Provide bonus material, such as making of, deleted scenes, interviews, audio commentaries, and trailer(s)
Use a clear mapping between the menu layout and the navigation buttons	Place the audio commentaries into the bonus material menu
Allow cycling through all menu items with one button	Provide background music
Make every navigation operation reversible	Avoid distracting background music
Provide transitions between menus, but make them skippable	Make background music tracks long enough
Make the transitions short	Use only background movies if they are not distracting

TABLE 1: The final guidelines for DVD menu design (short descriptions only)

number of subjects who encountered the corresponding usability problem. Figure 1 shows an example for a DVD-specific guideline. For some guidelines we also added illustrations for better comprehensibility. We structured the guidelines by conducting *card sorting* [8]. We had five (all male) participants (computer science students) with an average age of 23 (SD=1.58). The card sorting session resulted in the following eight categories: *Introduction*, *Main Menu*, *Menus*, *Navigation*, *Movie*, *Settings*, *Scene Selection*, and *Bonus*.

Validating and Improving the Guidelines

To evaluate and improve the guidelines that we obtained from the previous phases, we handed the guidelines to a DVD menu designer, who implemented a working *prototype*. This was an important step since there are different users (designer, evaluators and users of the actual system) that should benefit from the guidelines. The prototype allowed us to *test the guidelines* in terms of usability, readability, consistency and applicability.

Furthermore, we asked the designer to give us feedback on the technical feasibility of the guidelines. During the development of the prototype we found out that some features, such as showing the respective current settings in the language selection menu is a difficult task, as the number of menus is limited to 10,000 and every combination of language/subtitles represents a single menu. Furthermore, acoustic feedback represents a challenge since it is only possible to play one audio track per menu. Hence the developer can decide to either use this track for one continuous audio background loop or to provide audio feedback. There are many more technical limitations to face when implementing a DVD menu.

The prototype was subject to a *usability test* to ensure that the application of the guidelines leads to an improvement in usability. We used the same test setting as in the usability test during the first phase, but extended the number of tasks to nine. We tested 12 (3 female, 9 male) participants (3 light, 7 intermediate, 2 expert users) with an average age of 24.92 (SD=4.93). Only two intermediate and light users experienced some minor problems while accomplishing the tasks. 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 directly 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.

We finally verified the quality of the guidelines in terms of comprehensibility and applicability. Therefore we handed the entire set of guidelines out to ten groups of four students each. Their task was to evaluate 30 different common movie DVDs using *heuristic evaluation*. We received a lot of feedback regarding the guidelines and their structure. 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). Therefore, we added references and definitions of DVD specific terms (e.g. remote control features) to the guidelines. Whether putting the language and subtitles selection in one or two submenus became nearly a philosophic question. We also needed to adjust some wording.

4. DISCUSSION AND CONCLUSION

It is commonly accepted that guidelines are helpful tools when designing user interfaces [2]. Guidelines can also improve the value of a product for the customer. For example, the success of a shopping website depends largely on its usability. If customers have problems to select a product or purchase goods they will leave the site without buying anything. With DVDs it is somewhat different though, as the customer already buys the product without knowing about the usability of the DVD menu (which is the same for mobile phones or a video games). Furthermore, the menu is not the determining factor for purchasing a DVD. This is probably among the reasons why production companies currently do not care enough about usability issues of their DVD menus. Nevertheless, usability inadequacies of DVD menus can make watching a DVD a frustrating instead of a joyful experience and can therefore cast a bad shadow onto the production company.

Other reasons for badly designed DVD menus are technical constraints, which we also addressed in this paper, and the fact that production companies try to keep the production costs low.

Our study revealed that it is important to carefully design DVD menus, or else customers will get frustrated when navigating through the menu. The set of guidelines presented in this paper should provide a basis for developing usable DVD menus by simply following them throughout the design process. Future work will extend the set of guidelines in terms of content (e.g. what is special for series, music DVDs or box sets). It is important to notice that guidelines are always work in progress and further iterations would improve their quality even further.

5. ACKNOWLEDGEMENTS

We would like to thank Marc Gyarmaty, Markus Gärtner, Bernd Moser, Krunoslav Barta, Mohammad Tabatabai Irani and the students from our usability engineering class in spring 2005.

REFERENCES.

- [1] De Lancie, P. (2000) *Post Linear: Menu Design for DVD*. http://millimeter.com/ar/video_post_linear_menu/ (last date of access: May 4, 2006).
- [2] Henninger, S., Haynes, K. and Reith, M.W. (1995) A Framework for Developing Experience-Based Usability Guidelines. *Proceedings of DIS 1995*, pp 43-53, ACM Press.
- [3] Henninger, S. (2002) Tools Supporting the Delivery and Application of Usability Patterns. Patterns Workshop. CHI 2002.
- [4] Kappel, K., Tomitsch, M., Költringer, T. and Grechenig, T. (2005) Developing User Interface Guidelines for DVD Menus. *Extended Abstracts CHI 2006*, pp 177-182, ACM Press.
- [5] Költringer, T., Tomitsch, M., Kappel, K., Kalbeck, D. and Grechenig, T. (2005) Implications for Designing the User Experience of DVD Menus. *Extended Abstracts CHI 2005*, pp 1565-1568, ACM Press.
- [6] CMU-CS-93-183 (1993) *Why are Human-Computer Interfaces Difficult to Design and Implement?* Carnegie Mellon University, Pittsburgh, PA.
- [7] Norman, D.A. (2001) *DVD Menu Design: The Failures of Web Design Recreated Yet Again*. <http://www.useit.com/alertbox/20011209.html> (last date of access: May 2, 2006).
- [8] Robertson, J. (2001) *Information design using card sorting*. <http://www.steptwo.com.au/papers/cardsorting> (last date of access: May 2, 2006).
- [9] Tetzlaff, L. and Schwartz, D.R. (1991) The use of guidelines in interface design. *Proceedings of CHI 1991*, pp 329-333, ACM Press.
- [10] Tomitsch, M., Költringer, T., Kappel, K. and Grechenig, T. (2006). DVD Menu User Interface Guidelines. Research Industrial Software Engineering (RISE), RISE-01/06, Schwechat, Austria.