Structured Heuristic Evaluation of Online Documentation

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Increasingly, online documentation is the only documentation that companies provide with their products. As printing and publishing costs rise, and as help systems become more robust, PDFs and online help systems are replacing printed user guides and reference manuals. To minimize customer resistance to this change and encourage use of online documentation, the online documentation must be at least as easy to use as a printed book. This paper presents a structured process for evaluating the usability of online documentation, based on a list of heuristics for navigating through and finding content.

Keywords: heuristic evaluation, online documentation, usability, online help.

The Need for Usability Inspections of Online Documentation

Adopting best practices from software development, documentation development teams are starting to employ principles such as reuse of content and iterative usability evaluation:

- Reuse of content helps ensure consistency of information and simplifies maintenance. It also creates authoring challenges because the information must remain accurate regardless of the context or order in which the user accesses it.

- Feedback from users helps identify areas where access mechanisms, structure, labeling, and depth of content need improvement to meet users' needs. Ideally, usability evaluation begins early in the documentation development cycle, with task analysis, card sorting exercises, and walk-throughs of document skeletons, before a large investment is made in creating content.

As with any large project, design defects can persist despite everyone's best efforts to employ user-centered information design principles. Compounding the problem is the tendency of organizations to make changes to the software right up to the release date, requiring the documentation effort to intensify as it tries both to stay current with these changes and to conduct its own quality control processes before release. The result can be unexpected usability problems that erode users' trust in the online documentation.

For example, if the product design evolves toward the end of the development cycle (feature deferred to another release or critical features added to this release), the structure of the documentation might become unwieldy or might not properly emphasize the new features.

Performing a heuristic evaluation of the online documentation during these final, intense weeks can help identify serious navigation flaws as well as less severe usability degradations, while there is still time to correct them before the documentation meets its users. This type of evaluation, sometimes referred to as a "design-oriented evaluation" [Garzotto, 1995], focuses on the user's ability to access needed information, not on the quality of the information itself. It assumes that content issues have received appropriate attention during documentation development—for example, through numerous reviews by subject matter experts to ensure accuracy and completeness.

Heuristic evaluation requires two components: a list of heuristics or guidelines that are detailed enough for practical use; and a process for evaluators to follow when working with the heuristics to evaluate the documentation. This paper provides a list of online documentation usability heuristics that focus on information access and navigation and describes a process for applying them. Not only useful as documentation nears completion, heuristic evaluation can identify access and navigation problems at any point in the documentation development cycle, once the structure and access mechanisms of the online documentation are in place.

Existing Usability Guidelines for Online Documentation

In researching existing guidelines for usability of online documentation, the authors found three types of related works in the literature:

- Heuristic evaluation criteria for software user interfaces
- Detailed heuristic evaluation criteria for hypertext, hypermedia, and multimedia
- A case study of evaluating a repository of structured online documentation created in SGML

These resources suggest criteria and dimensions for evaluating online documentation that can be focused on heuristic evaluation of access and navigation issues.

Nielsen's Ten Heuristics—a Good Start: Jakob Nielsen's ten heuristics for evaluating software usability provide a structure for usability inspections [Nielsen, 1994]. They include heuristics which specify that help and documentation should:

- Be easy to search
- Focus on the user's task
- List concrete steps to be carried out
- Not be too large

The remaining nine heuristics, intended for software usability, are applicable to online documentation, to the extent that online documentation has a user interface that requires reading

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and navigation. Organizations that are serious about performing heuristic evaluation normally start with the Nielsen list and then create more specific checklists that address the issues specific to their products. The set of heuristics recommended in this paper evolved in this manner.

Surveying the Literature: Heuristics for Online Documentation Usability: The authors researched additional lists of heuristics in the literature that focused more directly on evaluating hypertext, hypermedia, and multimedia. Following are examples of the criteria defined by these heuristics:

- Accessible, maintainable, visually consistent, comprehensive, accurate, task oriented [Mehlenbacher, 1993]

- Accuracy, completeness, pertinence, appearance, readability, clarity, task-orientation, task-supportiveness, entry points [Grice and Ridgway, 1993]

- Richness, reuse, consistency, ease, self-evidence, suitability [Salminen, 1999]

- Richness, ease of use, consistency, self-evidence, predictability, isomorphism, transparency of meaning, motivation, autonomy, naturalness of metaphor, competence, phatic function [Ficarra, 1997]

These criteria reflect common concerns and suggest a baseline for generalized heuristics for evaluating online documentation. Criteria such as "richness" and "accuracy" refer to the usefulness of the content, which the method described here does not address. However, because access and navigation are tightly integrated with content (such as the likely reading path users will follow, or the labeling that will convey the most meaning), evaluators must familiarize themselves with the content usability issues that have already been addressed before beginning work on access and navigation issues. (If content issues have not been addressed, then a more prolonged heuristic evaluation of content and navigation should be conducted—not the focus of this paper.)

In addition to evaluation criteria, most of the articles about heuristic evaluation of online documentation describe the same dimensions for structuring the evaluation. Interestingly, the same four dimensions appeared in each article, with slight differences in terminology. For example, the following definitions are from Garzotto [Garzotto, 1995]:

- Content: The pieces of information included in the application.
- Structure: The organization of the content as perceived by the user.
- Appearance: How content and functions are shown to the user.
- Dynamics: How users interact with content and move among pieces of content.

The heuristic evaluation method suggested in this paper incorporates these four dimensions. It includes the content dimension primarily to help identify which criteria are *not* of high priority in design-oriented evaluation, although they could still be considered if time permits.

The Question of Learnability

Usability is commonly defined as a combination of learnability, ease of use, usefulness, and pleasure. For a new product or system that a person uses at his/her discretion, learnability can spell the difference between adoption or rejection. For a system that a person *must* use—for example, to keep his/her job, learnability can spell the difference between productivity and wasted time.

Organizations assume people must go through some kind of learning process to be successful using new products. However, why create documentation that imposes an additional learning burden? If the structure of the documentation is not self evident, then people must brave unfamiliar territory to figure it out. Even with new approaches to online documentation—such as embedded help—which display information without requiring an extra step from the user, information designs must consider what happens if the user wants more information than what is displayed in embedded help.

Applying the Book Metaphor

Once opened, online documentation requires less learning if it draws on users' prior experiences. Applying the book metaphor to online documentation succeeds because it draws on people's prior experiences. People have successfully navigated books for centuries [Mitterer et al., 1992]. Online manuals in PDF format and online help that includes a table of contents and an index take a cue from book design. They enable the user to build a mental map of the information structure, a heuristic recommended for Web navigation [Farkas and Farkas, 2000]. In addition, the user can follow familiar pathways:

- From front to back (for all PDFs, for a help system if it has a browse sequence)
- From a contents page to a specific topic
- From a cross-reference to the related information
- From an index topic to a specific topic (help system automatically; PDF is tool dependent)
- To a user-defined bookmark from any other location

In addition, online documentation can provide a pathway from the current page to a previously viewed page ("back", breadcrumbs, history list). This feature helps online documents meet the important heuristic of allowing users to hold their place while exploring other possible avenues [Rubens, 1991].

Beyond the Book Metaphor: Searching

In online documentation, one-click navigation from "pointers" [Farkas, 1992] to specific topics is a welcome feature that printed documentation lacks. Yet users often cannot find the information they need because they become lost while they explore. Even when they find useful information, they may be unsure whether they have seen all of the available information on the topic of interest [Grice and Ridgway, 1993]. In these cases, they can employ online searching.

If the user resorts to online searching, it might be considered a usability failing in some product contexts [Grayling, 2002]. In other product contexts, online searching is a natural and expected technique for finding needed information. Regardless, with searching, the book metaphor may fail unless the search facility communicates the structure of the document within the search results themselves.

Online help systems are now providing more book-like features such as running page headers and footers on topic "pages". These features address the growing recognition that people who "open the book" anticipate a book-like experience. Careful information design, thorough testing of possible task-oriented paths through the information, and clear pointers to relevant information about a topic can give people the sense of control they enjoy with a printed book.

Usability Heuristics for Evaluating Online Documentation

The usability heuristics presented here:

- Enable a quick and thorough inspection of online documentation to identify problems that may hinder the user's ability to access and navigate the information.

- Focus on online help and online manuals, the two forms of online documentation that are the most popular today.

The heuristics address the issues discussed earlier in this paper. A step-by-step process for applying the heuristics appears later in this paper.

Criteria Category	Evaluation Dimensions			
	Structure	Presentation	Dynamics	Content (not the focus)
1. Orientation	The user: • Knows how to get to all information about a topic. • Knows his/her place within the information structure. • Can determine where a search result is in the document structure.	Primary related topics are easy to distinguish from tangential related topics.	The user: • Can get back to previous location. • Can hold current place while checking other information.	

Criteria Category	Evaluation Dimensions			
	Structure	Presentation	Dynamics	Content (not the focus)
2. Efficiency	Frequently sought information is located at high levels of the structure. Within headings, the most important words come first. Layered information and branching provide minimalist paths through information.	Related-information links are positioned where they are most easily noticed.	The user can navigate quickly to the last item, first item, any item, and selected item. Commonly performed operations require no more than 2 clicks. The user can easily identify how to access online help or the online manual.	
3. Flexibility		The same information can appear in different views depending on context.	Several paths are provided to the same information: context sensitivity, index with alternative terms, contents that reflects user's place, related-topics linking, maps. Simple and advanced searching are available.	
4. Control	The user can choose how many levels of the structure to view.	The user: • Can customize window size, contents pane size, and text size. • Can move information to keep product in view.	The user: • Can easily annotate information. • Can easily place bookmarks. • Can easily print needed information.	
5. Recognition	Titles can be recognized without the context of surrounding information. Link labels clearly indicate their destination. Search results show how each result differs from the others. Index keywords are easy to recognize and distinguish.	Symbols and color are used to reinforce information structure.	Navigation aids are clearly labeled. Links look like links. Search results show term searched for.	

Criteria Category	Evaluation Dimensions			
	Structure	**Presentation**	**Dynamics**	**Content (not the focus)**
6. Familiarity	Titles represent real-world concepts and tasks.	Symbols do not conflict with other common uses, such as international symbols.	Navigation takes advantage of people's experience with books.	New terms are defined within 1 click at every occurrence.
7. Consistency	Headings at the same level in a section use parallel structure to help users identify the information they cover.	Presentation of information on various pages is consistent so that differences between pages are meaningful.	Navigation follows the same pattern throughout the documentation.	Words have the same meaning from one use to another.
8. Readability and aesthetics		Information is presented in a size and color that is easy to read. Different levels of headings are easy to distinguish. Online documentation does not clash with the design of the product screen. Information is pleasing to the eye.		
9. Context-sensitivity (help only)	Context sensitive topics are logically positioned within the information structure. If the current topic does not present the information needed, the supporting information is no more than 1 or 2 clicks away.	Context-sensitive help windows do not cover up the work area. Related-topic links are easy to identify.	The user can easily identify how to access context-sensitive help.	Content answers user's expected questions, whether through task support (suitability) or reference information or conceptual information or other.
10. Clarity	Information pieces can be read in any order, or a guide to the order is provided.			Reused information retains meaning in any context. Meaning holds no matter how the user combines the information pieces.

Method for Heuristic Evaluation of Online Documentation

Performing a heuristic evaluation of online documentation is a two-part process. It consists of inspecting the documentation for needed improvements and performing information lookup tasks to uncover any additional problems that may surface in the context of real-world use.

More than One Evaluator: It is beneficial to assign at least two people to perform any heuristic evaluation. Multiple evaluators provide a more thorough analysis and a higher degree of certainty than a single evaluator. The more thorough analysis is a result of reaching a consensus on the varying perceptions, sensibilities, and experience that different people bring to the evaluation. For example, one person might discover a problem that another might overlook.

The higher degree of certainty results from agreement among two or more evaluators regarding usability problems. For example, if two or three evaluators are confused about the meaning of a title, it is likely that most people will also be confused. In this case, it is the similarities in the responses of two or more people that raise the level of confidence in findings and recommendations.

Preparation: To understand the real-world tasks that a user might perform using the online documentation, the evaluators must learn:

- Who the users are, including details about their jobs.
- What tasks various user groups will perform with the product.
- The most critical product functions that the documentation supports.
- Details about how the product works and its functionality.
- Particular concerns of developers.
- Particular concerns of users, based on user feedback or interviews.

Even though this information might be available in written form, conducting interviews with development and marketing team members helps evaluators ensure the information is up-to-date and gives them an opportunity to fill in any gaps.

More than One Cycle: Evaluators can maintain their focus by structuring the heuristic evaluation into several cycles, each of which analyzes different features of the online documentation [Kurosu, 1997]. Evaluators can agree on which heuristics to analyze in each cycle. A logical way to group the heuristics is by dimension: structure, presentation, and dynamics. Within each cycle, evaluators should both perform tasks and inspect specific features. (Note that content problems are to be recorded only if they are severe; evaluators do not focus on them in this type of evaluation.)

Severity Ratings: To help prioritize the findings to decide which need immediate attention, evaluators assign severity ratings to their findings. The following table lists one example of severity rating values and definitions that evaluation teams can adapt for their own use:

Severity Rating	*Definition*
-3	Impedes task completion (either product or information seeking)
-2	Creates annoyance
-1	Obscures a product feature or capability
0	Raises questions for further study
+1	Promotes usability

Data Collection and Analysis: For consistency in reporting, evaluators can use data collection and analysis forms to record their initial impressions. The following partial form shows an example of how evaluators might structure the criteria for each dimension into a form, with columns for severity ratings and a description:

Criteria Category	Structure Criteria	Severity Rating	Problem and Location (note that this column would be larger for real note-taking)
1. Orientation	The user: • Knows how to get to all information about a topic. • Knows his/her place within the information structure. • Can determine where a search result is in the document structure.		
2. Efficiency	Frequently sought information is located at high levels of the structure. Within headings, the most important words come first. Layered information and branching provide minimalist paths through information.		
3. Flexibility	N/A		
4. Control	The user can choose how many levels of the structure to view.		

After each evaluator completes the evaluation cycles, s/he writes descriptions of findings and recommendations for addressing the issues identified. Then the evaluators discuss their findings together and agree on which recommendations are feasible to implement within the time remaining before documentation (and product) release. The evaluators also create a secondary list of findings and recommendations to implement for the next release.

Step-by-Step Procedure for Heuristic Evaluation of Online Documentation

1. Collect background information about users, their jobs, the product functionality and the tasks users perform with it, and developer and user concerns.

2. Identify 10 to 20 information-seeking tasks that are critical for successful use of the product. If both online help and online manuals are provided, decide which information source the users are likely to access to perform each task.

3. Decide how many evaluation cycles to make and which dimensions and heuristics to focus on within each cycle, and decide which cycles include information-seeking tasks and which include inspection tasks.

4. Complete the evaluation cycles. It is impossible to view every page of the documentation; instead, the goal is to identify "low hanging fruit."

5. Fill in findings on a data collection form. Be sure to add enough detail so that notes are understandable later.

6. Discuss your findings with the other evaluator(s), and reach agreement on which findings must receive immediate attention and which can be deferred to a later release.

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