

Usability* Standards for Website Development

Listed here are the recommended top 25 most important guidelines for creating usable websites. On a scale of one to five, each one of these guidelines is rated as five. Source for this list is *Research-Based Web Design and Usability Guidelines*, a joint publication of the US Department of Health and Human Services and the General Services Administration. Released in 2006, this book contains 209 guidelines intended for website managers, developers, and usability testers. Full text of the book is at the link <http://www.usability.gov>, sublink http://usability.gov/pdfs/guidelines_book.pdf.

A total of 18 professionals in the field of usability contributed to this book, including such respected practitioners as Robert Bailey, Joseph Dumas, and Janice Redish. The book is a review of research studies of usability, and it distills the most important findings from the literature and ranks the guidelines it proposes in relative order of importance and relative strength of evidence.

Also included in this document are the Nielsen heuristics for evaluating usability (see page 6).

* *Usability* is defined as the measure of the quality of a user's experience when interacting with a product—whether a website, a software application, mobile technology, or any user-operated device.

Item #	Page #	Summary	Guideline
1.	2	Provide Useful Content	Provide content that is engaging, relevant, and appropriate to the audience.
2.	2	Establish User Requirements	Use all available resources to better understand users' requirements.
3.	3	Understand and Meet User's Expectations	Ensure that the Web site format meets user expectations, especially related to navigation, content, and organization.
4.	4	Involve Users in Establishing User Requirements	Involve users to improve the completeness and accuracy of user requirements.
5.	10	Do Not Display Unsolicited Windows or Graphics	Do not have unsolicited windows or graphics 'pop-up' to users.
6.	23	Comply with Section 508	If a Web site is being designed for the United States government, ensure that it meets the requirements of Section 508 of the Rehabilitation Act. Ideally, all Web sites should strive to be accessible and compliant with Section 508.
7.	23	Design Forms for Users Using Assistive Technologies	Ensure that users using assistive technology can complete and submit online forms.
8.	24	Do Not Use Color Alone to Convey Information	Ensure that all information conveyed with color is also available without color.
9.	35	Enable Access to the Homepage	Enable users to access the homepage from any other page on the Web site.
10.	36	Show All Major Options on the Homepage	Present all major options on the homepage.
11.	37	Create a Positive First Impression of Your Site	Treat your homepage as the key to conveying the quality of your site.
12.	45	Avoid Cluttered Displays	Create pages that are not considered cluttered by users.
13.	46	Place Important Items Consistently	Put important, clickable items in the same locations, and closer to the top of the page, where their location can be better estimated.
14.	47	Place Important Items at Top Center	Put the most important items at the top center of the Web page to facilitate users' finding the information.
15.	72	Eliminate Horizontal Scrolling	Use an appropriate page layout to eliminate the need for users to scroll horizontally.
16.	77	Use Clear Category Labels	Ensure that category labels, including links, clearly reflect the information and items contained within the category.
17.	86	Use Meaningful Link Labels	Use link labels and concepts that are meaningful, understandable, and easily differentiated by users rather than designers.
18.	121	Distinguish Required and Optional Data Entry Fields	Distinguish clearly and consistently between required and optional data entry fields.
19.	122	Label Pushbuttons Clearly	Ensure that a pushbutton's label clearly indicates its action.
20.	159	Make Action Sequences Clear	When describing an action or task that has a natural order or sequence (assembly instructions, troubleshooting, etc.), structure the content so that the sequence is obvious and consistent.

Item #	Page #	Summary	Guideline
21.	170	Organize Information Clearly	Organize information at each level of the Web site so that it shows a clear and logical structure to typical users.
22.	171	Facilitate Scanning	Structure each content page to facilitate scanning: use clear, well-located headings; short phrases and sentences; and small readable paragraphs.
23.	172	Ensure that Necessary Information is Displayed	Ensure that all needed information is available and displayed on the page where and when it is needed.
24.	180	Ensure Usable Search Results	Ensure that the results of user searches provide the precise information being sought, and in a format that matches users' expectations.
25.	181	Design Search Engines to Search the Entire Site	Design search engines to search the entire site, or clearly communicate which part of the site will be searched.

Not in the top 25 but worth mentioning is item 11.8 (page 107): "Use at least a 12-point font (e.g., typeface) on all Web pages. Research has shown that fonts smaller than 12 points elicit slower reading performance from users. For users over age 65, it may be better to use at least fourteen-point fonts. Never use less than nine-point font on a Web site."

A more detailed version of the table follows, with explanatory comments:

Item #	Page #	Summary	Guideline	Comment
1.	2	Provide Useful Content	Provide content that is engaging, relevant, and appropriate to the audience.	Content is the information provided on a Web site. Do not waste resources providing easy access and good usability to the wrong content. One study found that content is the most critical element of a Web site. Other studies have reported that content is more important than navigation, visual design, functionality, and interactivity.
2.	2	Establish User Requirements	Use all available resources to better understand users' requirements.	The greater the number of exchanges of information with potential users, the better the developers' understanding of the users' requirements. The more information that can be exchanged between developers and users, the higher the probability of having a successful Web site. These could include customer support lines, customer surveys and interviews, bulletin boards, sales people, user groups, trade show experiences, focus groups, etc. Successful projects require at least four (and average five) different sources of information. Do not rely too heavily on user intermediaries. The information gathered from exchanges with users can be used to build 'use cases.' Use cases describe the things that users want and need the Web site to be able to do. In one study, when compared with traditional function-oriented analyses, use cases provided a specification that produced better user performance and higher user preferences.
3.	3	Understand and Meet User's Expectations	Ensure that the Web site format meets user expectations, especially related to navigation, content, and organization.	One study found that users define "usability" as their perception of how consistent, efficient, productive, organized, easy to use, intuitive, and straightforward it is to accomplish tasks within a system. It is important for designers to develop an understanding of their users' expectations through task analyses and other research. Users can have expectations based on their prior knowledge and past experience. One study found that users acted on their own expectations even when there were indications on the screen to counter those expectations.

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				The use of familiar formatting and navigation schemes makes it easier for users to learn and remember the layout of a site. It's best to assume that a certain percentage of users will not use a Web site frequently enough to learn to use it efficiently. Therefore, using familiar conventions works best.
4.	4	Involve Users in Establishing User Requirements	Involve users to improve the completeness and accuracy of user requirements.	<p>One of the basic principles of user-centered design* is the early and continual focus on users. For this reason, user involvement has become a widely accepted principle in the development of usable systems. Involving users has the most value when trying to improve the completeness and accuracy of user requirements. It is also useful in helping to avoid unused or little-used system features. User involvement may improve the level of user acceptance, although the research is not yet clear that it does in all cases. There is little or no research suggesting that user involvement leads to more effective and efficient use of the system. Finally, the research suggests that users are not good at helping make design decisions. To summarize, users are most valuable in helping designers know what a system should do, but not in helping designers determine how best to have the system do it.</p> <p>* <i>User Centered Design</i> is a highly structured, comprehensive product development methodology driven by</p> <ul style="list-style-type: none"> • clearly specified, task-oriented business objectives, and • recognition of user needs, limitations, and preferences.
5.	10	Do Not Display Unsolicited Windows or Graphics	Do not have unsolicited windows or graphics 'pop-up' to users.	Users have commented that unsolicited windows or graphics that 'pop up' are annoying and distracting when they are focusing on completing their original activity.
6.	23	Comply with Section 508	If a Web site is being designed for the United States government, ensure that it meets the requirements of Section 508 of the Rehabilitation Act. Ideally, all Web sites should strive to be accessible and compliant with Section 508.	<p>Section 508 requires Federal agencies to ensure that their procurement of information technology takes into account the needs of all users—including people with disabilities. About eight percent of the user population has a disability that may make the traditional use of a Web site very difficult or impossible. About four percent have vision-related disabilities, two percent have movement-related issues, one percent have hearing-related disabilities, and less than one percent have learning-related disabilities.</p> <p>Compliance with Section 508 enables Federal employees with disabilities to have access to and use of information and data that is comparable to that provided to others. This also enhances the ability of members of the public with disabilities to access information or services from a Federal agency.</p> <p>For additional information on Section 508 and accessibility:</p> <ul style="list-style-type: none"> • http://www.section508.gov • http://www.w3.org/WAI/
7.	23	Design Forms for Users Using Assistive Technologies	Ensure that users using assistive technology can complete and submit online forms.	Much of the information collected through the Internet is collected using online forms. All users should be able to access forms and interact with field elements such as radio buttons and text boxes.

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8.	24	Do Not Use Color Alone to Convey Information	Ensure that all information conveyed with color is also available without color.	<p>Never use color as the only indicator for critical activities. About eight percent of males and about one-half of one percent of females have difficulty discriminating colors. Most users with color deficiencies have difficulty seeing colors in the green portion of the spectrum.</p> <p>To accommodate color-deficient users, designers should:</p> <ul style="list-style-type: none"> • Select color combinations that can be discriminated by users with color deficiencies; • Use tools to see what Web pages will look like when seen by color deficient users; • Ensure that the lightness contrast between foreground and background colors is high; • Increase the lightness contrast between colors on either end of the spectrum (e.g., blues and reds); and • Avoid combining light colors from either end of the spectrum with dark colors from the middle of the spectrum.
9.	35	Enable Access to the Homepage	Enable users to access the homepage from any other page on the Web site.	<p>Many users return to the homepage to begin a new task or to start a task over again. Create an easy and obvious way for users to quickly return to the homepage of the Web site from any point in the site.</p> <p>Many sites place the organization's logo on the top of every page and link it to the homepage. While many users expect that a logo will be clickable, many other users will not realize that it is a link to the homepage. Therefore, include a link labeled 'Home' near the top of the page to help those users.</p>
10.	36	Show All Major Options on the Homepage	Present all major options on the homepage.	Users should not be required to click down to the second or third level to discover the full breadth of options on a Web site. Be selective about what is placed on the homepage, and make sure the options and links presented there are the most important ones on the site.
11.	37	Create a Positive First Impression of Your Site	Treat your homepage as the key to conveying the quality of your site.	In terms of conveying quality, the homepage is probably the most important page on a Web site. One study found that when asked to find high quality Web sites, about half of the time participants looked only at the homepage. You will not get a second chance to make a good first impression on a user.
12.	45	Avoid Cluttered Displays	Create pages that are not considered cluttered by users.	Clutter is when excess items on a page lead to a degradation of performance when trying to find certain information. On an uncluttered display, all important search targets are highly salient, i.e., clearly available. One study found that test participants tended to agree on which displays were least cluttered and those that were most cluttered.
13.	46	Place Important Items Consistently	Put important, clickable items in the same locations, and closer to the top of the page, where their location can be better estimated.	Users will try to anticipate where items will appear on their screen. They will start 'searching' a page before the layout appears on their screen. When screen items remain constant, users learn their location on a page, and use this knowledge to improve task performance. Experienced users will begin moving their mouse to the area of the target before the eye detects the item. Users can anticipate the location of items near the top much better than those farther down the page.
14.	47	Place Important Items at Top Center	Put the most important items at the top center of the Web page to facilitate users' finding the information.	Users generally look at the top center of a page first, then look left, then right, and finally begin systematically moving down the total Web page. All critical content and navigation options should be toward the top of the page. Particularly on navigation pages, most major choices should be visible with no, or a minimum of, scrolling.
15.	72	Eliminate	Use an appropriate page layout to eliminate	Horizontal scrolling is a slow and tedious way to view an entire screen. Common page

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		Horizontal Scrolling	the need for users to scroll horizontally.	layouts including fluid and left-justified may require some users to scroll horizontally if their monitor resolution or size is smaller than that used by designers.
16.	77	Use Clear Category Labels	Ensure that category labels, including links, clearly reflect the information and items contained within the category.	Category titles must be understood by typical users. Users will likely have difficulty understanding vague, generalized link labels, but will find specific, detailed links, and descriptors easier to use.
17.	86	Use Meaningful Link Labels	Use link labels and concepts that are meaningful, understandable, and easily differentiated by users rather than designers.	To avoid user confusion, use link labels that clearly differentiate one link from another. Users should be able to look at each link and learn something about the link's destination. Using terms like 'Click Here' can be counterproductive. Clear labeling is especially important as users navigate down through the available links. The more decisions that users are required to make concerning links, the more opportunities they have to make a wrong decision.
18.	121	Distinguish Required and Optional Data Entry Fields	Distinguish clearly and consistently between required and optional data entry fields.	Users should be able to easily determine which data entry fields are required and which are optional. Many Web sites are currently using an asterisk in front of the label for required fields. Other sites are adding the word 'required' near the label. One study found that bolded text is preferred when compared to the use of chevrons (>>>), checkmarks, or color to indicate required fields.
19.	122	Label Pushbuttons Clearly	Ensure that a pushbutton's label clearly indicates its action.	The label of a pushbutton should clearly indicate the action that will be applied when the pushbutton is clicked. Common pushbutton labels include 'Update,' 'Go,' 'Submit,' 'Cancel,' 'Enter,' 'Home,' 'Next,' and 'Previous.'
20.	159	Make Action Sequences Clear	When describing an action or task that has a natural order or sequence (assembly instructions, troubleshooting, etc.), structure the content so that the sequence is obvious and consistent.	Time-based sequences are easily understood by users. Do not force users to perform or learn tasks in a sequence that is unusual or awkward.
21.	170	Organize Information Clearly	Organize information at each level of the Web site so that it shows a clear and logical structure to typical users.	Designers should present information in a structure that reflects user needs and the site's goals. Information should be well-organized at the Web site level, page level, and paragraph or list level. Good Web site and page design enables users to understand the nature of the site's organizational relationships and will support users in locating information efficiently. A clear, logical structure will reduce the chances of users becoming bored, disinterested, or frustrated
22.	171	Facilitate Scanning	Structure each content page to facilitate scanning: use clear, well-located headings; short phrases and sentences; and small readable paragraphs.	Web sites that are optimized for scanning can help users find desired information. Users that scan generally read headings, but do not read full text prose--this results in users missing information when a page contains dense text. Studies report that about eighty percent of users scan any new page. Only sixteen percent read each word. Users spend about twelve percent of their time trying to locate desired information on a page. To facilitate the finding of information, place important headings high in the center section of a page. Users tend to scan until they find something interesting and then they read. Designers should help users ignore large chunks of the page in a single glance.

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				Keep in mind that older users (70 and over) will tend to scan much more slowly through a web page than will younger users (ages 39 and younger).
23.	172	Ensure that Necessary Information is Displayed	Ensure that all needed information is available and displayed on the page where and when it is needed.	Users should not have to remember data from one page to the next or when scrolling from one screenful to the next. Heading information should be retained when users scroll data tables, or repeated often enough so that header information can be seen on each screenful.
24.	180	Ensure Usable Search Results	Ensure that the results of user searches provide the precise information being sought, and in a format that matches users' expectations.	Users want to be able to use the results of a search to continue solving their problem. When users are confused by the search results, or do not immediately find what they are searching for, they become frustrated.
25.	181	Design Search Engines to Search the Entire Site	Design search engines to search the entire site, or clearly communicate which part of the site will be searched.	Designers may want to allow users to control the range of their searches. However, users tend to believe that a search engine will search the entire Web site. Do not have search engines search only a portion of the site without clearly informing users which parts of the site are being searched. Keep in mind that what a designer may consider to be the entirety of a site may not be the same as what the user thinks is the 'whole' site. For example, many large sites have various subsections that are maintained by different designers, so the user may think of a site as something that designers think of as several sites. Make sure it is clear to users what part(s) of the Web site are being searched. Provide a means for users to narrow the scope of searches on large Web sites by providing easy access to specific subsites when searching.

Nielsen Usability Heuristics* are as follows:

Visibility of system status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

User control and freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

Consistency and standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

Flexibility and efficiency of use

Accelerators -- unseen by the novice user -- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

** The above usability heuristics were developed by Jakob Nielsen in collaboration with Rolf Molich in 1990 [Molich and Nielsen 1990; Nielsen and Molich 1990]. These have subsequently been refined, based on a factor analysis of 249 common usability problems [Nielsen 1994a] to derive a set of heuristics with maximum explanatory power, resulting in this revised set of heuristics [Nielsen 1994b].*

References

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