



Search & Advanced Search User Experience Requirements

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Introduction: Fundamentals of Search

What Is Important to Users

Recently, Julie Morrison, Peter Pirolli, and Stuart Card asked 2188 people “to recall a recent instance where you found important information on the World Wide Web, information that led to a significant action or decision.” The researchers learned that people consider finding information and comparing/choosing information to be the most important tasks they accomplish on the Web. Specifically, people use the web in order to “download information, get a fact, get a document, and to find out about a product” or service; people also use the Web to “evaluate multiple products or pieces of information in order to make a decision and to understand a topic,” usually by “locating facts or documents.”¹ In his review of the study, Jakob Nielsen points out that these findings are limited by the study’s focus on “important tasks” rather than average web use. However, Nielsen observes, understanding what users consider important offers other advantages:

- Critical tasks are more likely than average tasks to lead to value-added services that users will pay for.
- If you support important tasks, users are likely to turn to you for everyday tasks.
- By understanding what’s critical to users, you might gain insight into what’s different and exciting about the Web; this can inspire you to innovate.²

Hence, it is extremely important to facilitate people’s ability to find, compare, and choose information on the Web. So the next logical question is how do people go about finding the information they need?

Importance of Search to Users

A 1997 study by Jakob Nielsen revealed that “more than half of all users are search-dominant, about a fifth of the users are link-dominant, and the rest exhibit mixed behavior. The search-dominant users will usually go straight for the search button when they enter a website: they are not interested in looking around the site; they are task-focused and want to find specific information as fast as possible. In contrast, the link-dominant users prefer to follow the links around a site: even when they want to find specific information, they will initially try to get to it by following promising links from the home page. Only when they get hopelessly lost will link-dominant users admit defeat and use a search command. Mixed-behavior users switch between search and link-following, depending on what seems most promising to them at any given time but do not have an inherent preference”³ Nielsen’s findings have been validated consistently in the years since his original study.

The Failure of Search Tools

Although the majority of people rely upon search tools on the Web to achieve their important tasks, usability studies have demonstrated time and again that search tools actually *reduce* users’ chances of finding the information they seek. For example, in their 1997 research report “Why On-Site Searching Stinks,” User Interface Engineering found “users didn’t know what to type in a search edit box, or they didn’t know how to use the format the search engine expected.” A 2000 study from Forrester demonstrates that “On-site search has improved a little since 1997,” but not much—“Hence the title of the new Forrester study: ‘Must Search Stink?’”⁴

Research has identified several key points of failure in search tools. These can be grouped, roughly, into problems with formulation of queries and problems with results.

Problems with Query Formulation

1. Users do not understand how to use Boolean search correctly. Nielson demonstrates that users seeking information about two related items (say dogs and cats) will enter the query “cats AND

¹ Morrison, Pirolli, & Card (2001)

² Nielsen, “The 3Cs of Critical Web Use” (2001)

³ Nielsen, “Search and You May Find” (1997)

⁴ “Back to the Basics” (2000)

dogs.” Nielsen reports, “they typically do not find anything, since the site does not include pages that mention both animals. Upon encountering a ‘no hits found’ message, the vast majority of users conclude that there is no information available about these pets.”⁵

2. “Users [don’t] seem to understand that some search engines distinguish between partial and entire words.” When given the option to search for whole or partial words, users tend to not change the default setting. Users don’t understand why, in a search for tires on an automotive Web site, using the term “tire,” pages containing the phrase “I’m tired” turns up in the results.
3. Users do not understand how plurals, prefixes, and suffixes influence their search results. For example, users are “puzzled” when plural and singular words in a query produce different results.
4. Users often misspell keywords when typing them in a search box. “Users didn’t always know that typing errors would produce poor results and couldn’t tell that the ‘no matches found’ message was caused by a typo.”⁶
5. Knowing what terms to enter in a search box is often extremely difficult unless the goal is strictly targeted. “Searching for specific items with specific names (such as books in a bookshop)” is significantly different from “looking for any documents that contain certain words or phrases. The former is a targeted, ‘hard’ search, the latter a much more complex ‘soft’ process that is likely to place greater demands on the user if they are to be successful.”⁷

Problems with Results

1. Users do not understand why a search engine returns the results it does, or why it fails to return results (see *problems with query formation* above).
 - Users do not understand how a search engine interprets a Boolean query
 - Users do not understand how misspellings, typos, plurals, prefixes, and suffixes influence search results.
 - Users do not understand how search engines handle partial and entire word matches in their results.
2. Results lack sufficient context for the user to judge relevance.
 - Pages listed in search results often have non-specific (often meaningless) titles
 - Summaries are either too short, too generic, or both
3. Full-Text search results cannot discriminate value or context:
 - A search for “dinosaur” will turn up results ranging from scientific studies of prehistoric creatures to metaphorical references to IBM as a “dinosaur” in the computer world.⁸
4. Useful results in an ontology-based search require the user to know the correct terms to enter in the search box (see *problems with query formation* above).
 - If a person is using the Yellow Pages, looking for a women’s department store, what kind of results will s/he get if s/he looks under “women” or “textiles” rather than “apparel”?
5. Results present too much irrelevant, confusing information, such as complex URLs, upload dates, and accuracy ratings.⁹

Improving User Experience by Improving Searching

Given the importance of searching to users in reaching their important goals on the Web, it is crucial to design search tools with a keen awareness of the perils and pitfalls described above and to work consciously toward overcoming them. Improvement of a site’s search tools will, by extension, improve overall user experience on the site, which will in turn promote the growth and continuing success of the site itself. Again, if people are able

⁵ Nielsen, “Search and You May Find” (1997)

⁶ “Why On-Site Searching Stinks” (1997)

⁷ “Designing an Effective Search Facility” (2001)

⁸ “Why On-Site Searching Stinks” (1997)

⁹ Bohman, “Effective Search Results” (n.d.)

to find the information they need on your site to accomplish their important tasks, they are likely to return again and again.

The user experience for a search tool consists of two parts: “the interface (design of the search forms and results pages) and the functionality (how well it matches and sorts pages).”¹⁰ The goal of the present document is to specify the user experience requirements for both parts.

¹⁰ “Search Engine User Experience” (n.d.)

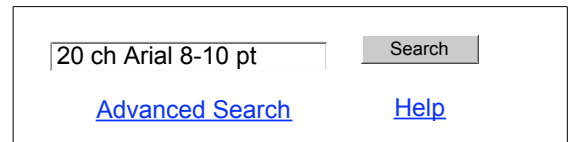
Requirements: Basic Search

Functional Requirements

1. The initial target of the basic search should be the contents of the entire web site.
2. The basic search should allow for Boolean commands ("and," "or"), although this does not need to be explained.¹¹ The option for a Boolean search should not be made obvious, "since all experience shows that users cannot use it correctly."¹² The default in a Boolean "and" search should be "any," not "all."
3. The search engine should be able to recognize and discriminate between synonyms, typos, plurals, prefixes, and suffixes in a logical manner.
4. A spell-checker is a very good idea, especially if it can suggest alternate spellings.¹³
5. User-entered keywords should be captured and analyzed to drive content development.
6. Access to a Glossary and to an index of terms, similar to the index in the Yellow Pages, will assist the user in choosing the best keywords to use in a query.¹⁴

Interface Requirements

1. The Basic Search box should appear on every page of the site.
2. The search box text field should be large enough to allow a minimum of 20 characters to be entered.¹⁵
3. The ideal font for the search box is Arial because it is a narrow font and allows the reader to enter more characters.
4. The font size in the box should be 10 points and no smaller than 8 points.
5. To the right of the search box should be a button labeled "Search."
6. The search should begin with either the touch of the return key or the click of the "Search" button.
7. A text link labeled "Advanced Search" should appear underneath the search box.¹⁶
8. A "Help" link on how to use the basic search functionality should be provided. This link should be close to the "Search" button.¹⁷
9. Provide clear, direct instructions. Use simple words to explain the process: remove all jargon and technical terms, and make sure that all icons have labels.¹⁸
10. Avoid surprises: explain all automated search features, such as stemming, phonetic matching, thesaurus lookups and stopwords.¹⁹



The screenshot shows a search interface with a text input field containing "20 ch Arial 8-10 pt", a "Search" button, and two links: "Advanced Search" and "Help".

Basic Search

¹¹ McGovern, "The Fundamentals of Quality Search" (2001)

¹² Nielsen, "Search and You May Find" (1997)

¹³ "Why On-Site Searching Stinks" (1997)

¹⁴ So You Think You Need an In-Site Search Engine?" (n.d.)

¹⁵ McGovern, "The Fundamentals of Quality Search" (2001)

¹⁶ *ibid*

¹⁷ McGovern, "More Fundamentals for a Quality Search" (2001)

¹⁸ "Search Engine User Experience" (n.d.)

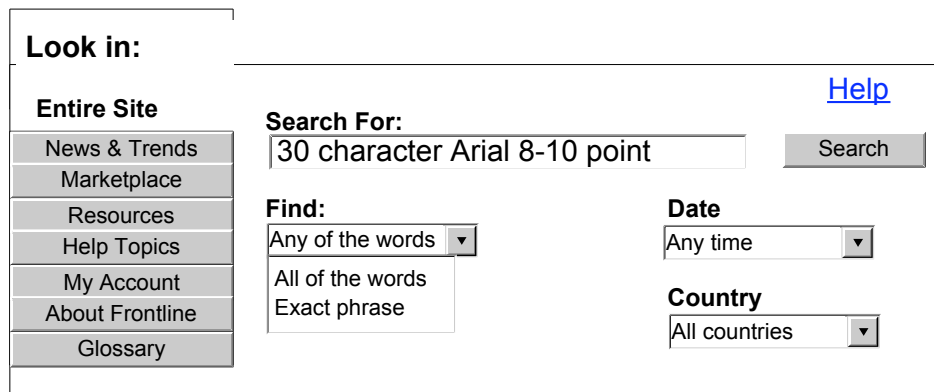
¹⁹ *ibid*

Requirements: Advanced Search

Functional Requirements

1. Advanced search should allow people to fully exploit the metadata collected on the content. For example, if date, country, product type, and author metadata were collected, then people should be able to refine their search based on these metadata.
2. Allow users to qualify or constrain their searches to specific content areas of the site via additional check boxes or drop-downs ("entire site" must be the default).²⁰ All content areas must be represented in the selection area.
3. In addition to the (unstated) option of using the Boolean operators AND/OR in the advanced search query box, the reader should be given radio button options that allow matches on "any word," "all words," and "precise phrase."²¹
4. The default in a Boolean search should be "any word."
5. The search engine should be able to recognize and discriminate between synonyms, typos, plurals, prefixes, and suffixes in a logical manner.
6. A spell-checker is a very good idea, especially if it can suggest alternate spellings.²²
7. User-entered keywords should be captured and analyzed to drive content development.
8. Access to a Glossary and to an index of terms, similar to the index in the Yellow Pages, will assist the user in choosing the best keywords to use in a query.²³

Interface Requirements



Advanced Search

1. The advanced search box should be larger than the basic search box because people will want to do more elaborate search queries (approximately 30 characters).²⁴
2. A "Help" link on how to use the advanced search functionality should be provided. This link should be close to the "Search" button.²⁵

²⁰ So You Think You Need an In-Site Search Engine?" (n.d.)

²¹ *ibid*

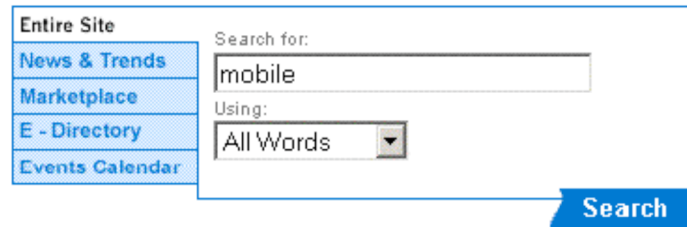
²² "Why On-Site Searching Stinks" (1997)

²³ So You Think You Need an In-Site Search Engine?" (n.d.)

²⁴ *ibid*

²⁵ *ibid*

3. Allow the user to specify search for “any of the words,” “all of the words,” or “exact phrase.” “Any of the words” should be the default. Either a drop-down select box or radio buttons will suffice.
4. Allow the user to constrain the search to a specific section of the site. “Entire Site” is the default.
5. All content areas on the site must be present as options for targeted search, according to a logical organization scheme. For example, targeted searches may be conducted in “News & Trends,” “Marketplace,” “Resources,” “Help Topics,” “My Account,” and “About Frontline Today,” etc.
6. If graphics are used as “action buttons” representing site areas that can be selected, it is crucial that these graphics look “click-able.” In the current design, shown below, they do not look click-able. (Note that the “search” button doesn’t look like a button, either.)



Entire Site
News & Trends
Marketplace
E - Directory
Events Calendar

Search for:
mobile

Using:
All Words

Search

7. Provide clear, direct instructions. Use simple words to explain the process: remove all jargon and technical terms, and make sure that all icons have labels.²⁶
8. Avoid surprises: explain all automated search features, such as stemming, phonetic matching, thesaurus lookups and stop-words.²⁷

²⁶ “Search Engine User Experience” (n.d.)

²⁷ *ibid*

Requirements: Targeted Search

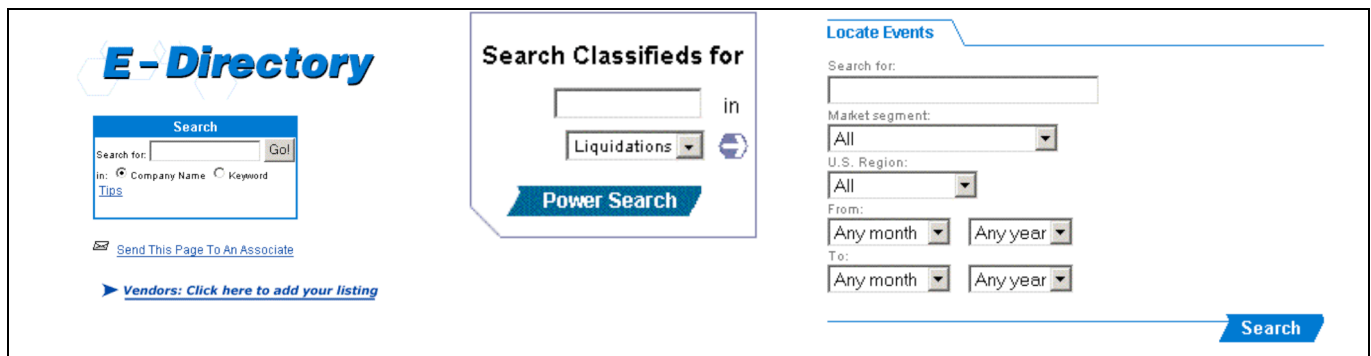
Functional Requirements

1. Targeted Search should allow people to fully exploit the metadata collected on the content. For example, if date, country, product type, and author metadata were collected, then people should be able to refine their search based on these metadata.
2. In addition to the (unstated) option of using the Boolean operators AND/OR in the advanced search query box, the reader should be given radio button options that allow matches on "any word," "all words," and "precise phrase."²⁸ The default in a Boolean search should be "any word."
7. The search engine should be able to recognize and discriminate between synonyms, typos, plurals, prefixes, and suffixes in a logical manner.
8. A spell-checker is a very good idea, especially if it can suggest alternate spellings.²⁹
9. User-entered keywords should be captured and analyzed to drive content development.
10. Access to a Glossary and to an index of terms, similar to the index in the Yellow Pages, will assist the user in choosing the best keywords to use in a query.³⁰

Interface Requirements

Target Search tools in individual content areas adhere to the same principles as Advanced Search.

Consistency is the most important consideration for Targeted Search. Although users may have the opportunity to search based upon unique criteria in a Targeted Search, the look/feel and behavior of the Targeted Search tool is the same as Basic Search and Advanced Search tools to the user.



Clearly, the current designs for targeted search do hold to the tenet of consistency.

²⁸ *ibid*

²⁹ "Why On-Site Searching Stinks" (1997)

³⁰ "So You Think You Need an In-Site Search Engine?" (n.d.)

Requirements: Results

Functional Requirements

1. Include Help, FAQ, Account, Glossary, “About Us,” “My Project,” and other static content areas in search results.
2. Quality and relevance are essential. Exclude matches to “Auxiliary” items (featured products, storefronts, etc. that are tagged to multiple pages) from search results.
3. Results from Help, FAQ, Account, Glossary, and “About Us” should be ranked higher than news articles in terms of quality and relevance.
4. To ensure that search results provide enough information to assist the user, each page in the site must have a meaningful title and concise, informative summary. This will make search results easier to comprehend and help users choose the right link when confronted with lengthy listings.³¹

Interface Requirements

Search for **Mobile** returned 307 matches.

[Advanced Search](#) [Help](#)

Glossary (Showing 1 of 20 matches) [NEXT 10 matches>>](#)

[Resources: Glossary: Mobile](#)
Blah blah blah blah blah **mobile** blah blah blah blah blah blah blah blah blah
blah blah blah blah blah blah ...
[Resource](#) > [Glossary](#) > [M](#) > [Mobile](#)

News & Trends (Showing 1 of 2 matches) [NEXT 1 Match>>](#)

[Wireless Web: fact or fiction?](#)
Frontline Solutions June 8, 2001
Wireless Internet access has become the Holy Grail of the **mobile** computing world, with vendors of all shapes and sizes touting mobile, Web-based tools for everything from e-mail to supply ...
[News & Trends](#) > [Product News](#) > [Educational Guides](#)

No matches were found in the following sections of the site.
[Marketplace](#)
[About Frontline](#)

You may wish to rsearch these areas individually using more specific terms (or some such advice).

[Advanced Search](#) [Help](#)

³¹ “Designing an Effective Search Facility” (2001)

General Layout Considerations

1. The search results page should avoid showing anything that does not directly relate to the search in question because this can confuse and distract people while they are carrying out what is a very specific activity.³²
2. The number of documents found should be displayed above the actual results. For example, "Search for **Mobile** returned 307 matches." Users can then choose to make a new query if the number of matches is unsatisfactory.³³
9. Arrange results according to the structure of the site in order to help user understand its organization. Provide a breadcrumb for each item.³⁴ Results are presented in groups according to the category they belong to on the site, such as "News & Trends."
3. Search results should show results in order of relevance.³⁵ This applies within site categories as well as overall. The most relevant results in "News & Trends" should be listed before less relevant ones in that section. If "News & Trends" returns the highest quality results, the category is listed first in the results; if "News & Trends" returns zero results, it is listed last.
4. Present the basic search box at the top of the search results and at the bottom (the advanced search environment tends to have a lot of features and takes up a lot of space on the screen). If possible, this basic search box should contain the advanced search choices that were made.³⁶
5. The search keyword(s) used in the search process should be displayed in the search box.³⁷
6. Search results should not show duplicate entries of content. This includes multiple URLs pointing to the same piece of content.³⁸

Presentation of Individual Results

Each search result should be laid out as follows.³⁹

1. The descriptive title of the document should be displayed, hyperlinked, and in 10-point font.
2. All other text should be in 8-point font.
3. Show a two-line summary of *the relevant portion* of the document, with the searched-for word or phrase highlighted (bolded). This includes product descriptions.
4. The classification under which the document can be found should appear last, hyperlinked. It should A breadcrumb representation would be appropriate: "Resources>Glossary>Specific Term."⁴⁰
5. The search results should be broken down into batches of 10.
6. "Next" and "Previous" links should be provided. "Next" links you to the next page, and "Previous" to the previous page. The link to "next" search result page needs to be obvious.⁴¹
7. The "next" link should automatically remove if only one search result page appears and jump directly to the content page if only one relevant result appears.⁴²

³² McGovern, "More Fundamentals for a Quality Search" (2001)

³³ McGovern, "More Fundamentals for a Quality Search" (2001); Bohmann, "Effective Search Results" (n.d.)

³⁴ McGovern, "More Fundamentals for a Quality Search" (2001)

³⁵ *ibid*

³⁶ *ibid*

³⁷ *ibid*

³⁸ *ibid*

³⁹ Adapted from McGovern, "More Fundamentals for a Quality Search" (2001)

⁴⁰ McGovern, "More Fundamentals for a Quality Search" (2001); "Guide to Search Tools: Search Engine User Experience" (n.d.)

⁴¹ McGovern, "More Fundamentals for a Quality Search" (2001); Bohmann, "Effective Search Results" (n.d.)

8. Display thumbnail images only for featured product results (which are displayed only when directly relevant to the query).

Handling “No Matches” Results⁴³

1. Show the standard site layout, including background colors, logos, text and link colors, and navigation links.
2. Provide a Search field so people can try a different search. Don't make them click a link or otherwise take an extra step to search again.
3. For a whole site search, site areas containing no matches should appear grouped together at the bottom of the first page of the results, under the heading “No matches were found in these areas of the site” (or something like that).
4. Include some text that explains why the search might have failed, and what people can do next. This list is carefully worded to be positive and helpful, rather than blaming the user for the search failure. For example:

The search for [insert search terms here] found no matches [on this site/ in the News & Trends section]. If you did not type a word in the Search box, you can do so now. This search engine covers this site only -- if you want to search the entire Web, use AltaVista, Google, HotBot or one of the other public search engines. If a word is misspelled, correct your spelling and search again. You may need to use a synonym, such as "red" instead of "crimson." If you have used uppercase letters, try using all lowercase. If your search required certain terms (using + or a phrase in quote marks) or excluded terms (using -), there may be no page that matches exactly. Try doing a simpler search.



Search Company Directory for at
No results were found matching your criteria

Marketplace

- [Long Slim Skirt2](#) TCSI Corp
- [Bolero](#) TCSI Corp
- [Classic Jacket](#) TCSI Corp
- [Horseshoe Neckline Dress](#) TCSI Corp
- [Shell2](#) TCSI Corp
- [Handbags or Purses, 17 in, 11 in, Leather, 12 in](#) hospitalitybotheanmartin
- [Handbags or Purses, 12 in, 15 in, Leather, 2 in](#) hospitalitybotheanmartin
- [Handbags or Purses, 12 in, 15 in, Leather, 2 in](#) hospitalitybotheanmartin
- [Handbags or Purses, 14 in, 14 in, Leather, 9 in](#) hospitalitybotheanmartin
- [Handbags or Purses, 11 in, 15 in, Leather, 5 in](#) hospitalitybotheanmartin

No results were found matching your criteria

No results were returned
Please search again

Problems with Current “No Results” Design

Currently, when a whole-site search returns no results in a specific site area, the user sees what appear to be error messages (because they are red).

Also, it is not clear what the error messages refer to, exactly. They fail to specify which area did not return matches.

⁴² Bohmann, “Effective Search Results” (n.d.)

⁴³ “Guide to Search Tools: No-Matches Pages” (n.d.)

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