

Summary of User Experience Issues in DalSpace:
Adapted from Maha ALJohani's MCS Thesis

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Credits

A large portion of this work is adapted from the Masters of Computer Science thesis entitled *Heuristic Evaluation of Dalhousie Repository Interface* by Maha ALJohani, published 2013-07-31 (URL:<http://hdl.handle.net/10222/31498>). Quotations from that thesis are not explicitly labelled in this work.

The photographs that accompany the user profiles (on pp. 68, 70, 72, and 74) are used with permission of the image creator, freedigitalphotos.net. Those images are excluded from the Creative Commons license.

Abstract

This report is adapted from Maha ALJohani's Masters of Computer Science thesis document. ALJohani research was about the use of a usability evaluation technique, heuristic evaluation, and its application to Dalhousie University's institutional repository, DalSpace.

Amongst the many activities ALJohani undertook to assess the usability of Dalspace, she interviewed users and potential users of DalSpace. Based on these background studies she created composite profiles of types of typical users and tasks they would need to complete to achieve the goals for which they would need to use DalSpace. The profiles and tasks appear in Part IV.

It should be noted that there are many strengths to DalSpace. This report is confined to potential problems with the user experience.

Through the evaluation fifty-seven potential problems with DalSpace's user interface were identified. This report described each of those issues in detail and recommends ways to address them. Of particular interest is Part III in which we attempt to address the root causes of the potential problems and rank the issues by severity as a way to recommend which issues should be addressed first.

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Part I

Introduction and Background

Authors' Note

As this document is adapted from a research thesis the tone may be somewhat more elaborate than is typical for such a report. It was not our intention to write like this but we choose to release the results earlier rather than delay for further revision.

It bears repeating that DalSpace has many strengths. This report is confined to potential problems with the user experience.

Images

We use two types of images to illustrate issues with DalSpace (see Fig. 1). Images that are exact reproductions of DalSpace are in full colour, images with annotations are in greyscale with superimposition of coloured text or shapes. For example, Figure 1a shows an entire webpage from DalSpace in colour; Figure 1b uses a colourful shape to highlight an 'empty' part of that same webpage.

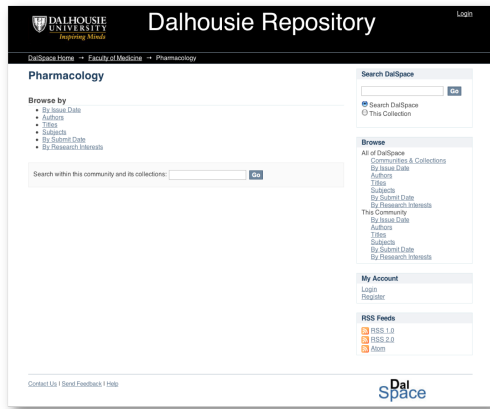
Image examples

Typefaces

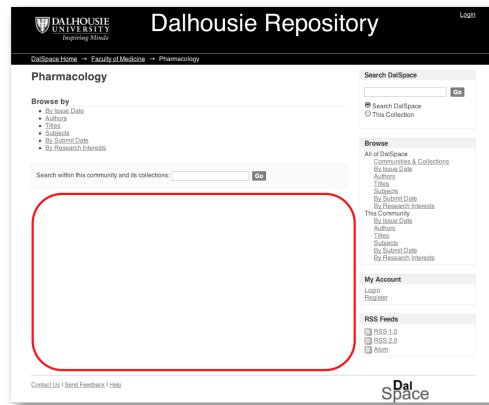
Because we need to quote text to refer to parts of the visual interface of DalSpace we adopt the conventions shown in Table 1 to distinguish between regular text and quotations.

Symbols and abbreviations

Asterisms (★) appear in the margin to signal particularly important issues.



(a) Example as-is



(b) Example with highlighting

Figure 1: Sample images of DalSpace

upright serif	regular text
<i>slanted serif</i>	linktext from DalSpace
sans serif	buttons from DalSpace
monospace	computer text (either user input or computer code)
boldface	headings in the report
SMALL CAPS	headings that could appear in DalSpace
<i>italics</i>	emphasis and titles (of cited sections and publications)
superscript	footnote indicator

Table 1: Rôles of typefaces used in this report

Chapter 1

Overview

1.1 Introduction

This report is adapted from Maha ALJohani's MCS thesis at Dalhousie University [1]. ALJohani conducted the research and wrote the thesis under the supervision of James Blustein. This report is based on an interpretation of the thesis document, and it provided to the Dalhousie Libraries for the purposes of quality assurance — not research.

ALJohani's thesis research was twofold: to apply the techniques of general usability heuristic evaluation to Dalhousie University's institutional repository (namely, DalSpace) with the aim of uncovering problems and making suggestions for improvement, and to assess the differences between types of experts and non-experts at applying the technique of heuristic evaluation.

1.2 Process

The measure of the quality of a user interface is usability. At the risk of oversimplifying a complex technical concept, at least three components are essential to any definition of usability: specified users, specified goals of those users, and a specified tool or product (as illustrated in Fig. 1.1).

Usability includes many measures but the three fundamental measures (of which most others are refinements) are:

efficiency the amount of effort users must contribute to get results (often measured in terms of time or speed but better measured as resources in for results out);

effectiveness the accuracy and completeness of results (similar to depth and breadth of expertise, and recall and precision in information retrieval); and

satisfaction how the users feel (affectively) about using the system and the results obtained.

In any evaluation, the relative importance of the various factors of usability should be established since they often conflict [9]. Furthermore each measure must have a practical measure — this is known as operationalising.

Usability factors

For the purposes of the study upon which this report is based, ALJohani synthesized details from focus group discussions and interviews to create fictitious user profiles (see App. A beginning on p. 68) and tasks (see App. B beginning on p. 77).

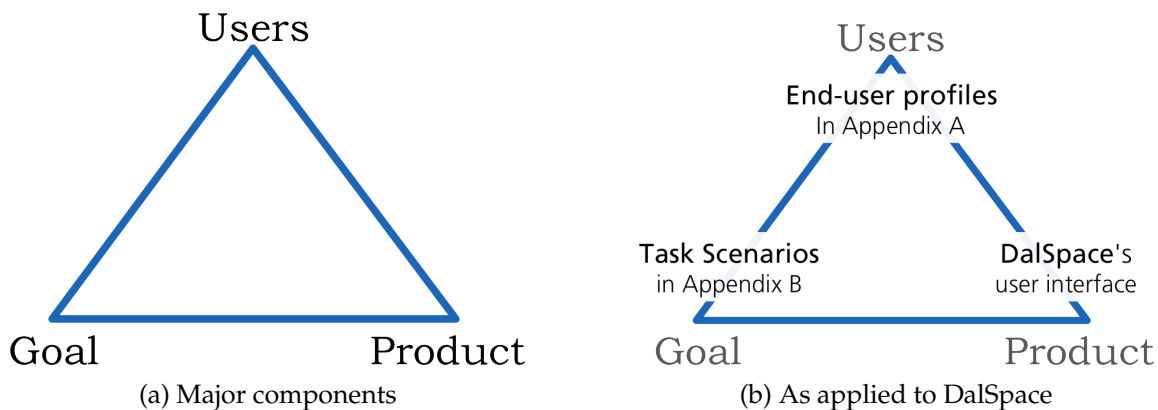


Figure 1.1: Simplified overview of usability's components

Heuristic evaluation

Heuristic evaluation is most often used as one of the first methods of detecting problems with the user interfaces* of software. The basic process of heuristic evaluation is to have experts in the technique systematically and rigorously examine a software product while pretending to be actual users with real goals. The goals and descriptions of characteristics of actual (or potential) users are necessary to guide the examination. The experts work individually and pool their results. Especially because the rules that are applied for evaluation are general (hence the term heuristic), and the fictive nature of the users and their goals, heuristic evaluation is an inspection — not a testing — method. Usability testing involves actual users performing actual tasks. The results from such testing is much more reliable than inspection methods but it is also much more complicated and expensive.

*The user interface of a software is the part through which the user acts to use the software [13, p. 4]. In a broader, though technically incorrect, sense the interface includes every part of the software where the user and software interact.

Part II

Results

Chapter 2

List of all issues found

The evaluators were recruited from the Dalhousie community. Some but not all of them had experience (through paid employment, research or classes) in usability evaluation. They were all furnished with the list of tasks and personae provided in the appendices, the descriptions of Nielsen and Molotch's general heuristics (Fig. 2.1) and Nielsen's definitions of the severity of potential problems (Table 2.1). The heuristics are described in detail in the thesis document [1].

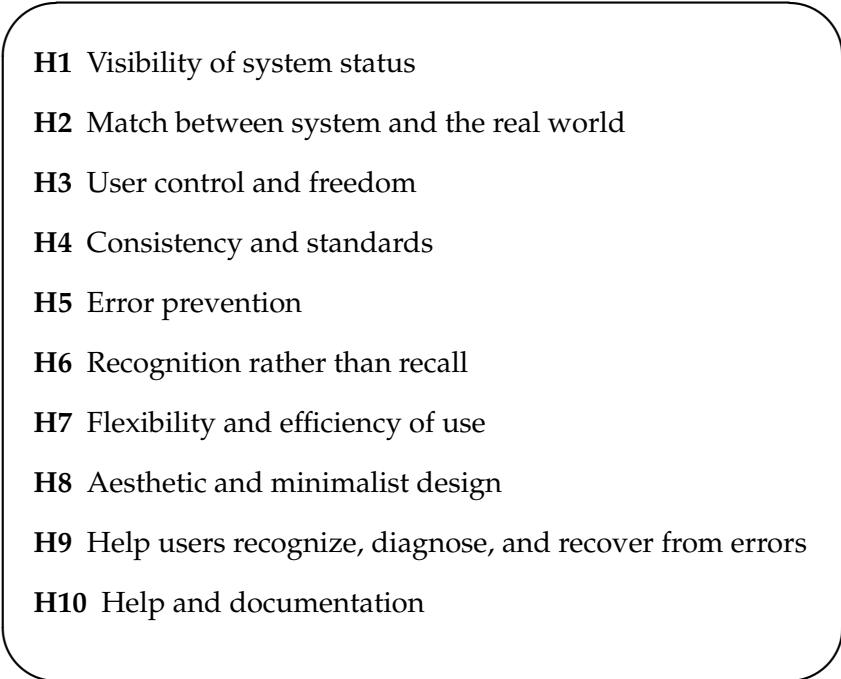
- 
- H1** Visibility of system status
 - H2** Match between system and the real world
 - H3** User control and freedom
 - H4** Consistency and standards
 - H5** Error prevention
 - H6** Recognition rather than recall
 - H7** Flexibility and efficiency of use
 - H8** Aesthetic and minimalist design
 - H9** Help users recognize, diagnose, and recover from errors
 - H10** Help and documentation

Figure 2.1: Names of the general heuristics applied to DalSpace

We do not agree with many of the evaluators' assessments of the severity of potential issues however for ease of cross-referencing we have retained the order and numbering of the issues from the original thesis. For information only we also list the issues in the categories that the evaluators used (see the Tables on pages 9 to 11).

Rating	Description
0	I don't agree that this is a usability problem at all
1	Cosmetic problem only: need not be fixed unless extra time is available
2	Minor usability problem: fixing this should be given low priority
3	Major usability problem: important to fix, so should be given high priority
4	Usability catastrophe: imperative to fix

Table 2.1: Nielsen's Severity Rating Scale[†]

2.1 Terminology

In the original thesis [1] each time a heuristic was deemed to be violated it was termed a 'problem'; in this report we have instead chosen to describe such potential problems as 'issues' since it is not clear that every violation really is a problem. We have however labeled some of the issues with an asterism (★) in the margin.

2.2 Number of issues

Note that some of the potential problems were combined after they were numbered. There are a total of 57 potential problems although the numbers go as high as 69, and that numbers 9 and 43 have subparts.

Our advice about what changes to DalSpace and its user interface are necessary are in Part III (which begins on page 57).

[†]Severity rating scale (Tab. 2.1) adopted from Nielsen [7].

Most Serious Issues

#	Brief Description
1	DalSpace is difficult to find
2	Two search boxes in the DalSpace homepage
3	Random search results when clicking on the GO button
4	When deleting a submission, the system does not provide an error message
5	Insufficient documentation
6	Introduction to logging-in and registering
7	Contact information in the homepage
8	Browse by author name
9	Seemingly inconsistent search results
10	Not enough filters for browsing by date
11	Browse a restricted community
12	Browse an empty collection by subject
13	Inconsistency of <i>View more</i> link
14	Search a keyword
15	View abstracts
16	Search keyword removed automatically from search bar

Table 2.2: Issues rated 'Catastrophic'

Major Issues

#	Brief Description
18	Non-alphabetic characters in name list
19	Register by NetID
20	Irrelevant search results
21	Scrolling down to view search results
22	Previous button when uploading a submission
23	Browsing by collection produces a long list of communities and sub-communities
24	Scope and filters while searching
25	Browser software's Back button while viewing an item
26	Update button in filters
27	The Go button in browsing by issue date
28	Browsing by issue date-wrong entry
29	View item-screen

Continues...

Major Issues (cont.)

#	Brief Description
30	Help option
31	Search 'This collection' option
32	RSS feeds
33	Crowded homepage
34	Community item breadcrumb list

Table 2.3: Issues rated 'Major'

Minor Issues

#	Brief Description
35	Sort the faculty profiles
36	Adding an extra reader field while submitting
37	Colours of visited links
38	User profile after logging-in with NetID
39	The Add and Apply buttons under <i>Discover</i>
40	Users' path vs. the document path
41	System suggests 'enter first few letters' to browse by title
42	Punctuation suggestions in search filters
43	Behaviour of dropdown menus in filters
44	Placement of <i>Show simple item record</i> link
45	Auto-fill on search
46	The number of the documents while browsing by subject
47	Indirect link to download a document
49	Browsing by issue date-wrong entry
54	Browse an empty collection by subject
55	URL link in the view item page

Table 2.4: Issues rated 'Minor'

Cosmetic Issues

#	Brief Description
56	Reaching the search box through the keyboard
57	'Discover' option
58	'Files in this item' header
59	Filter and sort at the same time
62	Error messages are not separated from the text

Table 2.5: Issues rated 'Cosmetic'

Non-UI Issues

#	Brief Description
67	File "icon" is generic
68	Inconsistent date format displays

Table 2.6: Issues considered not related to the user-interface

Chapter 3

Descriptions of all issues found

3.1 Issue 1: DalSpace is difficult to find

Evaluators reported that reaching DalSpace was difficult and not direct. Sample comments were: 'DalSpace is not easy to locate' and 'I did not know about DalSpace until I had to evaluate it'.

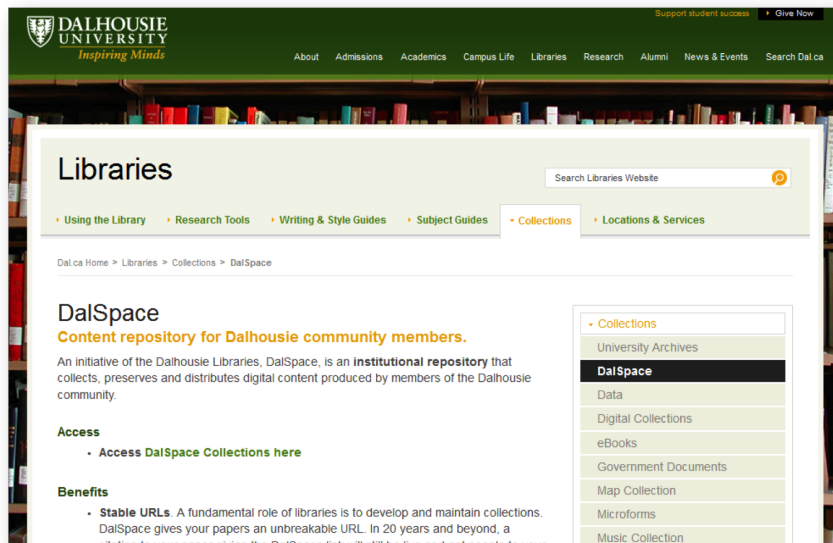


Figure 3.1: How to reach DalSpace through Dalhousie online libraries

Evaluators had to reach DalSpace through the Library's website in a category called 'library collections' (see Figure 3.1). This problem is related to an issue that arose in discussion with other experimental participants who noted that they could not take advantage

of DalSpace when they did not know that it existed, yet they must upload their completed theses using DalSpace.

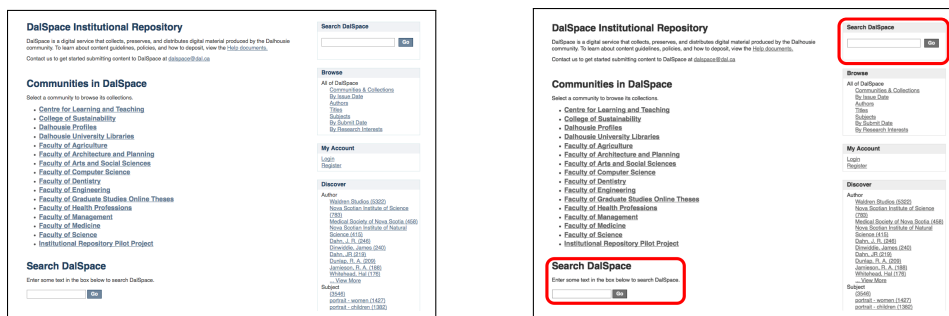
Recommended changes

- Evaluators suggested making DalSpace more prominent by a link that is called 'search DalSpace directory' in the Library's homepage.
- Participants in pre-evaluation discussion groups wondering if there could be a link from each faculty's homepage to the relevant section of the repository.
- One participant suggested a tutorial video about why and how to use DalSpace with a link in each faculty's website.
- Examiners in the thesis defence speculated that no usability issue with DalSpace's searching interface would be an important problem if DalSpace was used instead with a federated search. The consensus was that users would be best served if the content of DalSpace was available through a more general search, e.g. Google Scholar. ☆☆

3.2 Issue 2: Two search boxes in DalSpace homepage

DalSpace provides two search boxes in the homepage. One is in the right-middle of the same homepage as shown in Figure 3.2.

Some evaluators classified this as a catastrophic problem but others classified it as a cosmetic problem.



(a) Part of the main webpage

(b) With details highlighted

Figure 3.2: Two search boxes in DalSpace main webpage

Sample comments were ‘which search box I should use? I am confused’ and ‘two different search boxes confuse users. Do they give different results?’, and ‘users might think that these two boxes search two different things’.

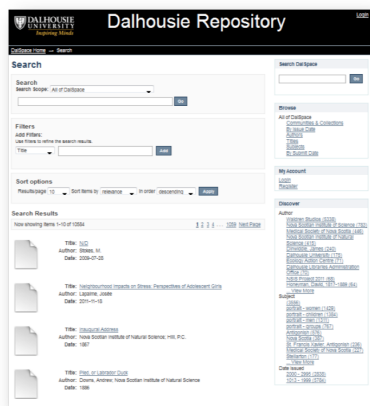
Recommended changes

Suggestions were to make only one search box or to make one of the boxes much more prominent than the other. A primary concern was to eliminate users’ confusion and help them to focus on achieving their goal rather than distracting them with a puzzling interface.

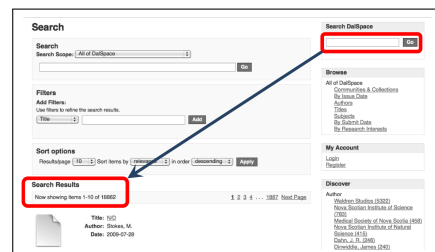
3.3 Issue 3: Random search results when clicking on the GO button without typing a keyword

See also §3.13 (p.25)

When users select the GO button without any search terms the system displays what appear to be random search results. See Figure 3.3. The issue occurs when using either search box.



(a) Example in context



(b) Details

Figure 3.3: Search results from clicking the GO button without a query string

Recommended changes

- A brief, polite and informative message to the user such as ‘Please enter a keyword in the search field before pressing Go’. It is important to keep users informed of the system’s state by providing appropriate feedback within a reasonable time.

- Another suggestion, which we recommend against, is that the system act as though the GO button had not been selected.

Related issue This issue is related to *Issue 13: Inconsistency of View more link* (p. 25).

3.4 Issue 4: When deleting a submission, the system does not provide an error message

One evaluator tried to remove a submission request that he/she had begun to complete. The evaluator clicked on the Remove selected submissions button as shown in Figure 3.4* and was surprised not to receive a warning message.

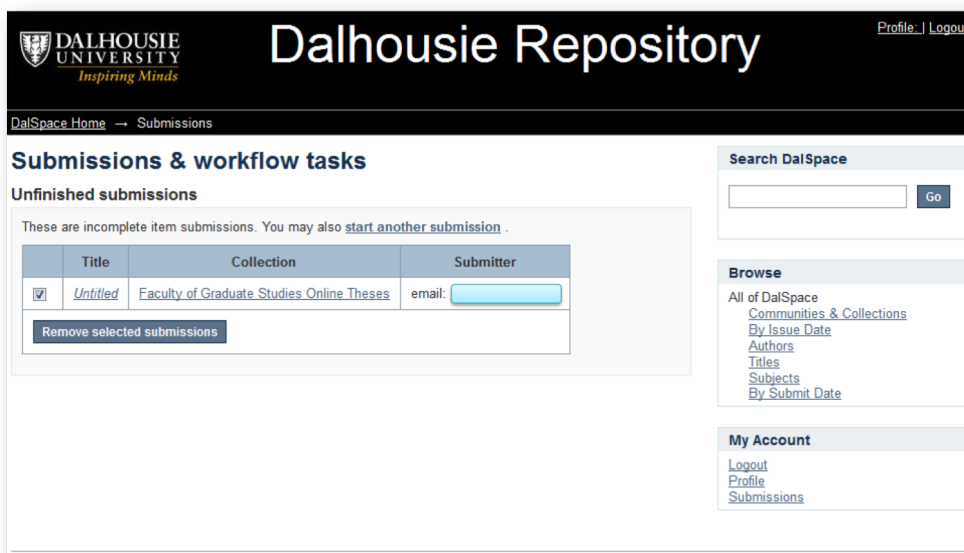


Figure 3.4: Deleting a submission

This behaviour could be a problem for many users. Not only is it a quasi-standard to confirm deletions in many similar systems but confirmation is usually recommended to prevent users from making errors.

*The e-mail address is redacted in Fig. 3.4.

Recommended changes

There are no perfect solutions to this issue. It is well known that users habituate quickly to such warnings even when the user must take action to dismiss the warning.

We recommend that the user be forced to confirm or cancel the deletion, and that the default option be to cancel.

3.5 Issue 5: Insufficient Documentation

The evaluators thought that having only a few introductory lines in the homepage and a link to only a one-page description of DalSpace was not enough.

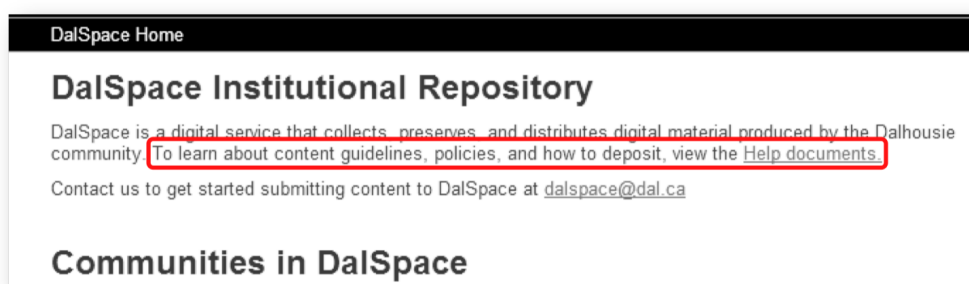


Figure 3.5: Introduction to DalSpace and the help documentation link

As well as what one evaluator documented, users should be provided with a full description of what DalSpace offers, how they can benefit from the service and when they should search the collections.

Recommended changes

Some evaluators thought that potential users should be provided with a full description of what DalSpace offers, how they can benefit from the service and when they should search the collections. One suggestion was to include a video tutorial.

It was apparent from focus group discussions with student-users and potential users (see Appendix A) that student-users would need tutorials and proper documentation for the system. This would help them know about the system and how to deal with it for their academic purposes.

There is a delicate tradeoff between a simple clean visual layout, an interface that will not be burdensome for blind users, and providing the right amount of information. Additionally, for an institutional application such as DalSpace, it is helpful if the design conforms to an established contemporary style. Therefore we recommend that there be

See also §3.7
(p. 18)

a link, perhaps labelled 'Read more about DalSpace. . .' leading to a secondary webpage with more information about DalSpace.

Related issues This issue is related to *Issue 9: Seemingly inconsistent search results* and *Issue 59: Filter and sort at the same time* (pp. 20 and 54).

3.6 Issue 6: Introduction to logging-in and registering

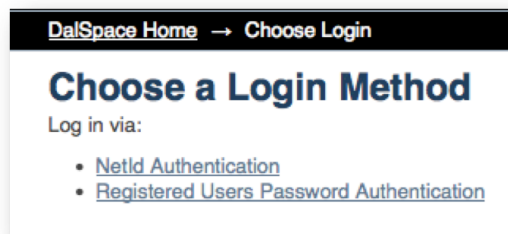


Figure 3.6: Options for Logging-in

New users are likely to be confused by the choice between logging-in to the system with a NetID (as a Dalhousie member) or to register as a new member. The system does not introduce the users to these two options with a good description.

See also §3.18
(p. 30)

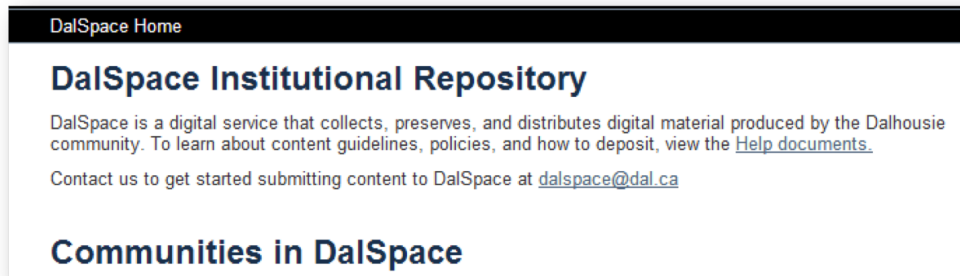
Suggested solution

- Provide more information in the homepage: a description when the user selects *register* that they have the opportunity to login without registering if they are members of Dalhousie University.
- Make the two options clearly different. One way to do this is to present the two options side-by-side but clearly separate.

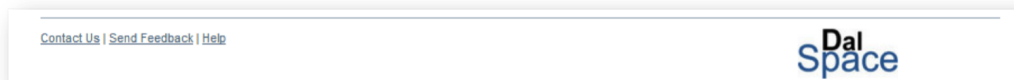
Furthermore, if users are not required to register or login then that option should be made explicit *and* a link should be provided for that purpose. The link might make little difference to human users but will be essential if DalSpace is to be indexed by search engines.

3.7 Issue 7: Contact information in the homepage

Some evaluators were surprised to find contact information in the main part of a general webpage.



(a) Contact information in main part of DalSpace's homepage



(b) Footer of a typical DalSpace webpage

Figure 3.7: Contact information in DalSpace webpages

Recommended changes

We recommended (in §3.5, on p. 16) that DalSpace conform to the general style of contemporary webpage design so users will find the interface familiar and thus quickly understand how to use it, as well as to improve DalSpace's professional appearance.

We endorse the use of the convention of including a *Contact Us* link in the webpages' footers and suggest considering replicating it in a local navigation menu.

3.8 Issue 8: Browse by author name

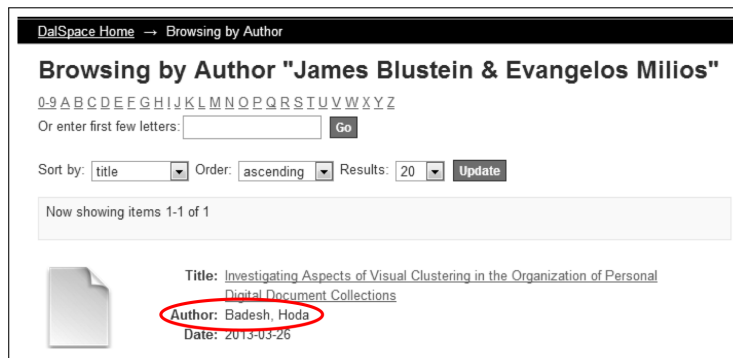
☆☆ This issue has two aspects.

Aspects

1. Evaluators were surprised to find that searches were not performed with the exact terms they had entered. For example searching for 'James' results in a list of publications for other names such as 'Jami' and 'Janet'.



(a) Browse by an author name



(b) Browse author's name not matching

Figure 3.8: Unexpected results when browsing by author name

2. Evaluators were surprised to find that some searches returned results under names that did not match the actual record. Figure 3.8a shows two webpages followed to reach a record. Figure 3.8b shows a close-up of the record page in which the name does not match the link from the search results.

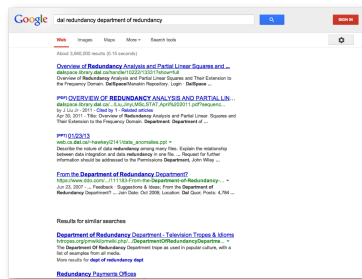
This inconsistency led evaluators to suspect that some records would not be found by a search for the name listed as the author in the record.

Users become uncomfortable when using computer systems that they think are wresting control from them. Furthermore, users stop trusting (or having confidence in) computer systems that seem to act contrary to users' instructions.

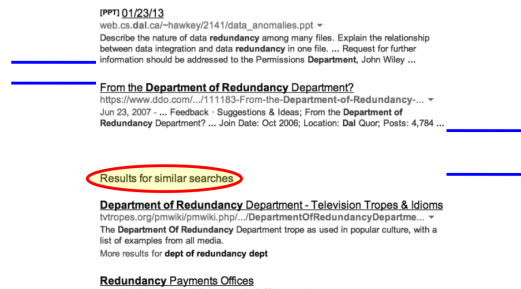
Recommended changes

1. The intention to help by expanding queries is admirable. A small change to the user interface is needed to keep users informed of what is happening.

A simple solution might be to follow the example of the Google search engine (see Figures 3.9a and 3.9b) which separates original queries from expanded ones with a text label and clear distinction — in Google’s case, a vertical gap twice the size of that between individual results — between the parts.



(a) An expanded query



(b) Highlights

Figure 3.9: Example of user interface of Google’s query expansion

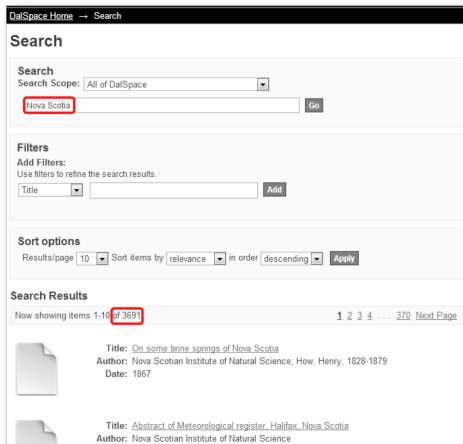
2. DalSpace shows the supervisors of a thesis as authors without any indication of what it is doing. The system should provide the user with an explanation that the supervisor of a thesis is considered as an author in the browsing results.

3.9 Issue 9: Seemingly inconsistent search results

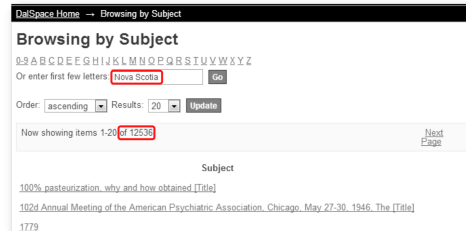
There are two sub-issues: different numbers of results are available when searching or browsing using the same query terms; and what differs between regular search results and ‘communities and collections’.

3.9.1 Browsing by subject

Evaluators were confused when they saw that browsing by subject produces results different from searching using the same queries. One noted ‘when I selected browse subject “Nova Scotia” on the right column of DalSpace home, I can see there are 382 items to be found. However, when I entered the same keyword “Nova Scotia” in the filter, it displays 924 items. Confusing !!’



(a) Search returns 3691 results



(b) Browsing 12536 results

Figure 3.10: Variation in the results by searching and browsing the same subject

Recommended changes

Either there is a serious technical error or the difference between 'browsing' and 'searching' must be made clear to users. ☆☆

3.9.2 Communities or Collections

When users search for 'faculty profile' (Fig. 3.11) thousands of results are available for browsing, but the link to the *Faculty Profiles* collection shows only the five most recently updated records, with no obvious way to continue browsing.

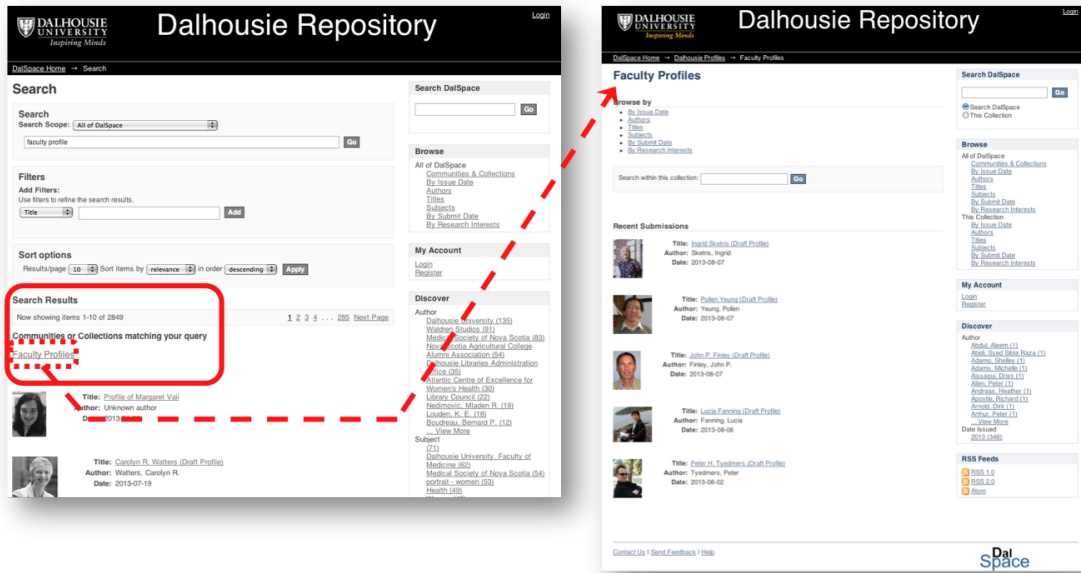
Incidentally, the word 'or' in the heading 'Communities or collections matching your query' should more correctly be 'and'.

Recommended changes

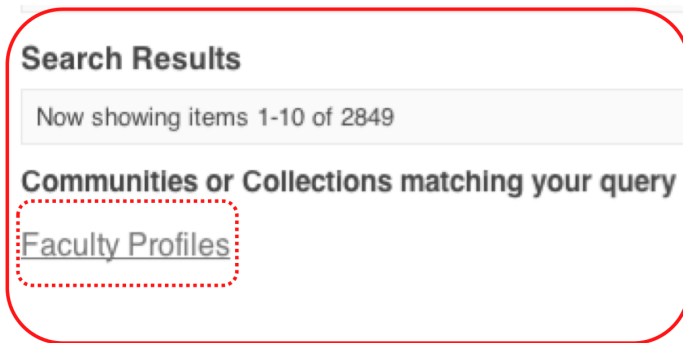
We do not understand the rationale that led to this behaviour. We can only say that there should be an easy way for users to browse once they have reached a collection by following a link from search. ☆☆

The heading should be corrected.

Related issues These issues are related to *Issue 5: Insufficient Documentation* and *Issue 59: Filter and sort at the same time* (pp. 16 and 54).



(a) Link from search results webpage to Faculty Profiles



(b) Details from search results webpage

Figure 3.11: Apparent inconsistencies in number of results searching vs. browsing

3.10 Issue 10: Not enough filters for browsing by date



Figure 3.12: Browsing by issue date sort options

Evaluators found that they could not do some of the tasks they wanted to using the filters while browsing. An example is shown in Figure 3.12. One evaluator described the problem thus: ‘For example, if I am only “interested” in theses while browsing by date so there should be some filters’.

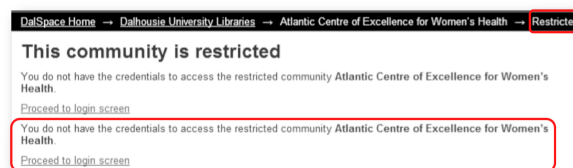
Recommended changes

This problem could be related to the issue in §3.9. Either more filters need to be provided or the way for users to do the type of searches they want to do must be made clearer.

3.11 Issue 11: Browse a restricted community



(a) Trying to view a restricted collection



(b) Details

Figure 3.13: Browsing a restricted collection

There are multiple issues with the response to users' attempts to view restricted collections. The issues came to light when an evaluator tried to view the *Atlantic Centre of Excellence for Women's Health* collection.

1. The error message is repeated. It should only appear once.
2. The tone of the error message places the blame on the user even though there was no way for the user to know that the collection was restricted. Some users will balk at such messages.
3. The error message should be much more helpful. It could explain why the collection is restricted and provide helpful links such as: return to previous webpage, go to main page, search for different documents.
4. The breadcrumb menu (at the top of the screen) is inconsistent. Except for the item at the far right (viz., *Restricted*) every link shows the location in the information space that the user navigated or the position of the current webpage in a path from the homepage. The last link does not follow that pattern.

Recommended changes

- It is not clear what the purpose of the error message is. It could be an overzealous attempt to secure the collection at the cost of discomforting users (including those users who could legitimately view it). The purpose could also be prevent anyone access to the collection directly from DalSpace's main webpage.

In the first case, a better approach would be to provide a brief overview of the collection and a request to login or register to use the documents in it. A similar approach is used in many commercial websites to entice potential users to register accounts.

In the second case, a better approach would be to disable links to the restricted content. If it is important that users know that the links could be active then they could be presented 'greyed out' and with a link rollover explaining briefly how to active them.

- The error message should only appear once. Better still would be a brief explanation and a request to login to view or use the materials in the collection.
- The breadcrumb menu should be removed or rethought. At the least the final item should be renamed to something like 'Login'.

3.12 Issue 12: Browse an empty collection

An evaluator noted that when the collection or community is empty ‘does not include any documents [the system] still shows filters at the top’ and the error message ‘Sorry, there are no results for this browse’ which is ‘easily lost as it is in plain text and visually dominated by the filters above’ as shown in Figure 3.14.

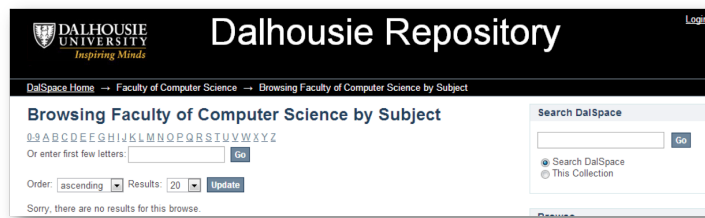


Figure 3.14: Browsing an empty collection by subject filter

Recommended changes

The filters should not be shown when there is nothing to apply them to. The error message should be more prominent.

3.13 Issue 13: Inconsistency of *View more* link

Following the link . . . *View more* from the main webpage leads to a webpage without any search features or filters as illustrated in Figure 3.15.

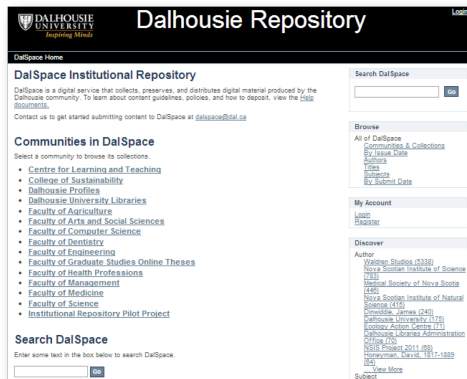
See also §3.3
(p. 14)

Recommended changes

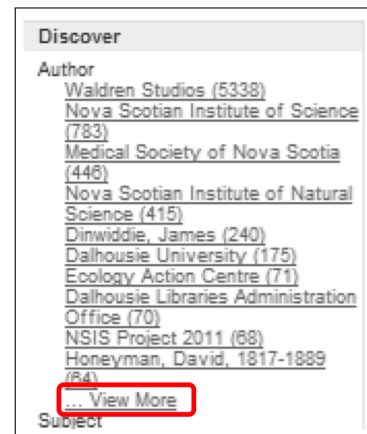
This problem could be related to the problem in §3.9. It seems that the presentation of the results is not consistent with other lists of documents. Consistency is essential for a satisfying user experience*.

* User experience (UX) is defined by the ISO [6, §2.15] as

person’s perceptions and responses resulting from the use and/or anticipated use of a product, system or service [including] all the users’ emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and accomplishments that occur before, during and after use. . . . User experience is a consequence of brand image, presentation, functionality, system performance, interactive behaviour and assistive capabilities of the interactive system, the user’s internal and physical state resulting from prior experiences, attitudes, skills and personality, and the context of use.



(a) Part of DalSpace main page



(b) Detail of part of DalSpace main page



(c) Destination of ... View More link

Figure 3.15: View more option

Related issue This issue is related to *Issue 3: Results of search without query string* (p. 14).

3.14 Issue 14: Search a keyword

Users think that some of the results from searches are irrelevant. This issue was noted in particular for the queries ‘mobile navigation’ and ‘web design’. The users expect to find documents that contained the two-word query. The example in Figure 3.16 shows that the highest ranked results list includes the word ‘mobile’ and the second highest ranked document has the word ‘navigation’. Although none of the documents found contain the query phrase in their title, the seventh (entitled *Digital Map Based Navigation System For Autonomous Vehicle with DGPS Localization*) seems most relevant.

See also §3.20 (p.31)

In the focus group study part of the thesis research, upon which this report is based, both Masters- and doctoral-level students spoke of the importance of precision in search results.

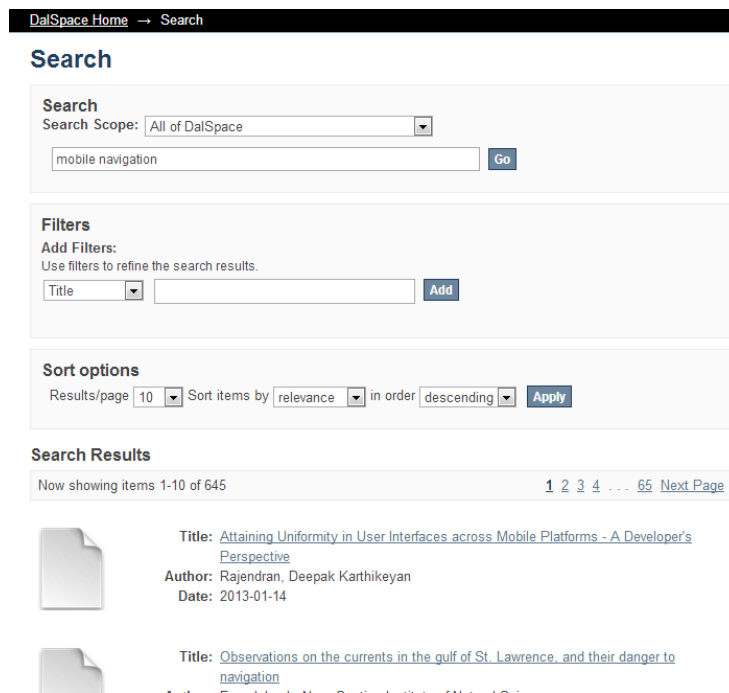


Figure 3.16: Search results

Recommended changes

Part of this problem is due to issues with the search engine which produces results for the interface to display. However, even with a perfect search engine users could still experience difficulties with the interface which would interfere — perhaps substantially — with their ability to successfully use DalSpace.

The interface indicates that the results are presented in ranked order by relevance but there are neither indications of the individual relevance scores nor of ties in the rankings. Because we expect an important part of the user population to be scholars for whom the potential for additional informative content would outweigh the potential of distraction from clutter by the presentation of the extra data.

A major part of the problem is that contrary to many users' expectations (based in part on their experience with natural language and with WWW search engines) rather than more terms making the search more specific the more terms the broader the search. For example, a query for 'wireless' in the online thesis collection on 2013-08-04 returned 51 results, but a search for 'network drug detection and access policy' conducted immediately following returned 1104 results. Furthermore, searching for an exact title (namely *Exploring Safer and Unsafe Drug Use and Sexual Practices Among Female Injection Drug Users Living in Small Towns / Rural Communities, in Cape Breton, Nova Scotia*) returned a list of 1242 documents!

3.15 Issue 15: View abstracts

Users need to select documents titles' to view their abstracts since the document surrogate shows only titles, authors' names, and publication dates (see Fig 3.17).

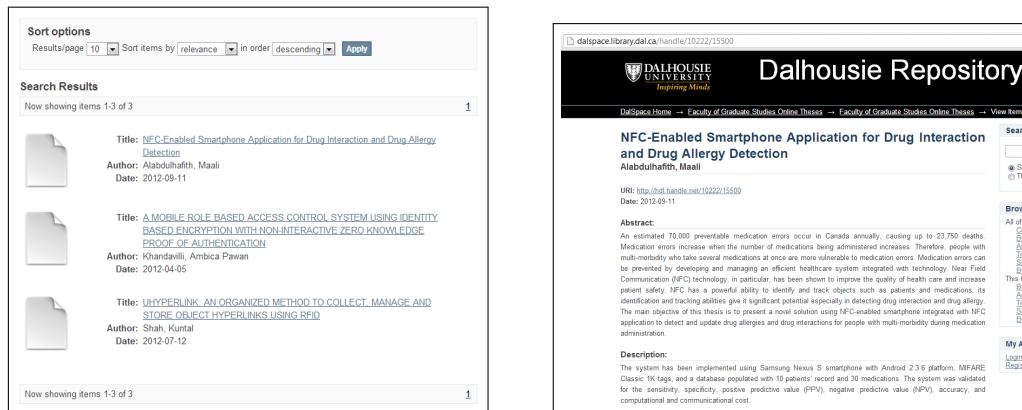


Figure 3.17: Abstract shown only for one result at a time

Recommended changes

The search results interface could be improved by showing the beginning of each abstract (as is done in the IEEE database). A slightly more complex but possibly better solution would be to let users choose between brief and extended views in the results list.

3.16 Issue 16: Search keyword removed from the search bar

When search results are presented, the query is removed from the search bar (see Fig. 3.18). This increases the difficulty of query reformulation, and forces users to scan the display to confirm that they entered the correct query.



(a) Details of keyword search from Dalspace homepage



(b) Details of search results from keyword search

Figure 3.18: Keyword is removed automatically after producing results

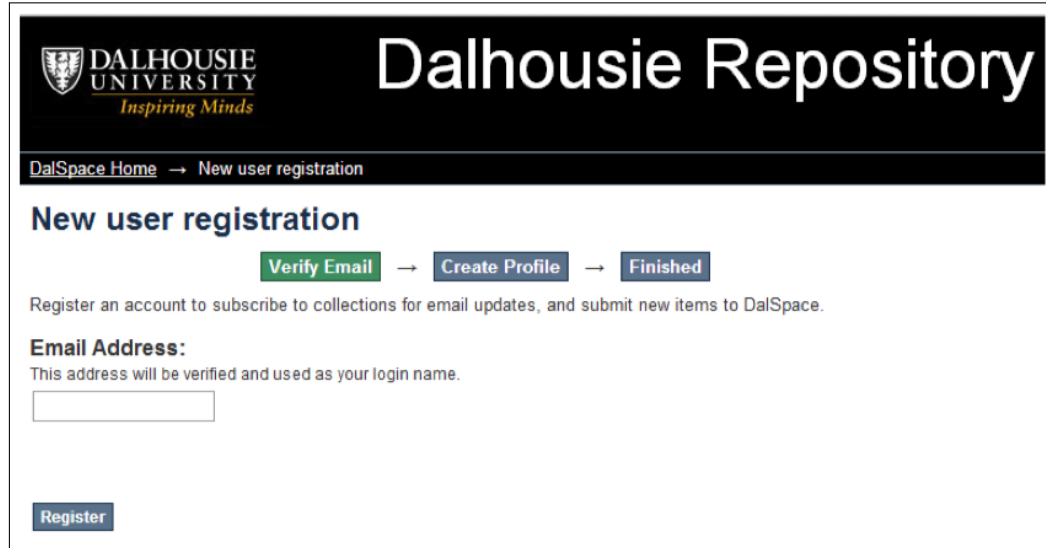
Recommended changes

The search box should contain the query string as default text when presenting results.

3.17 Issue 17 (addressed elsewhere)

3.18 Issue 18: Non-alphabetic characters in name list

The registration webpage provides no guidance for users who already have a NetID. This issue is a restatement of confusion regarding registration and log-in in §3.6 (on p. 17).



The screenshot shows the 'Dalhousie Repository' website header with the university logo and tagline 'Inspiring Minds'. Below the header, there is a navigation bar with 'DalSpace Home' and 'New user registration'. The main content area is titled 'New user registration' and features a progress indicator with three steps: 'Verify Email' (highlighted in green), 'Create Profile', and 'Finished'. Below this, a text prompt reads: 'Register an account to subscribe to collections for email updates, and submit new items to DalSpace.' The 'Email Address:' field is followed by the instruction 'This address will be verified and used as your login name.' and an empty text input box. At the bottom left of the form is a 'Register' button.

Figure 3.19: New user registration interface

Recommended changes

According to one of the evaluators, the webpage should 'inform users that they do not need to register if they have NetID'. DalSpace should also provide a description for both situations, viz., registering as a new user or just logging into the system using a NetID.

3.19 Issue 19: Register by NetID

Evaluators were confused by the apparently irrelevant non-alphanumeric symbols that preceded authors names in the search by author (as shown in Fig. 3.20). Following the links from those symbols led to documents but the connexion between the symbols and those documents is not apparent.



(a) Browsing by authors[sic] name



(b) Details of list of names

Figure 3.20: Browsing by author's name

Recommended changes

If the symbols are meant to be meaningful to users then their meaning should be made clear or at least presented in such a way that they do not appear to be an error (perhaps with headings such as SYMBOLS, LETTERS, and NUMBERS).

3.20 Issue 20: Irrelevant search results

Three evaluators were unsure of the relevance of search results. One noted that many of the results are not just irrelevant publications from the collection but are professors' profiles and 'some of the [publications] are not related to the [query terms] at all'. Users expect documents to be presented in decreasing order of relevance.

Recommended changes

The rationale for selecting articles, profiles, etc. for display must be made clear to the users in a simple straightforward way.

- Icons (with text alternatives for blind users and search engines) could be used to indicate document types such as articles and profiles
- Query terms (or their equivalents) could be highlighted in the results.
- When a document is judged to be relevant but no query terms appear in the display then an icon or brief note could be displayed to indicate the reason for the match, e.g. author supplied keywords which are not displayed in the results list.

3.21 Issue 21: Scrolling down to view the search results

The filter interface seems to occupy a great deal of screen space as shown in Figure 3.21. Of course the precise measure depends on each user's particular computer configuration, however, in what seems a typical case, the search refinements take about 2½ as much space as the results (not including their header). In the words of one evaluator, users must 'scroll down to see more than 2 or 3 items'.

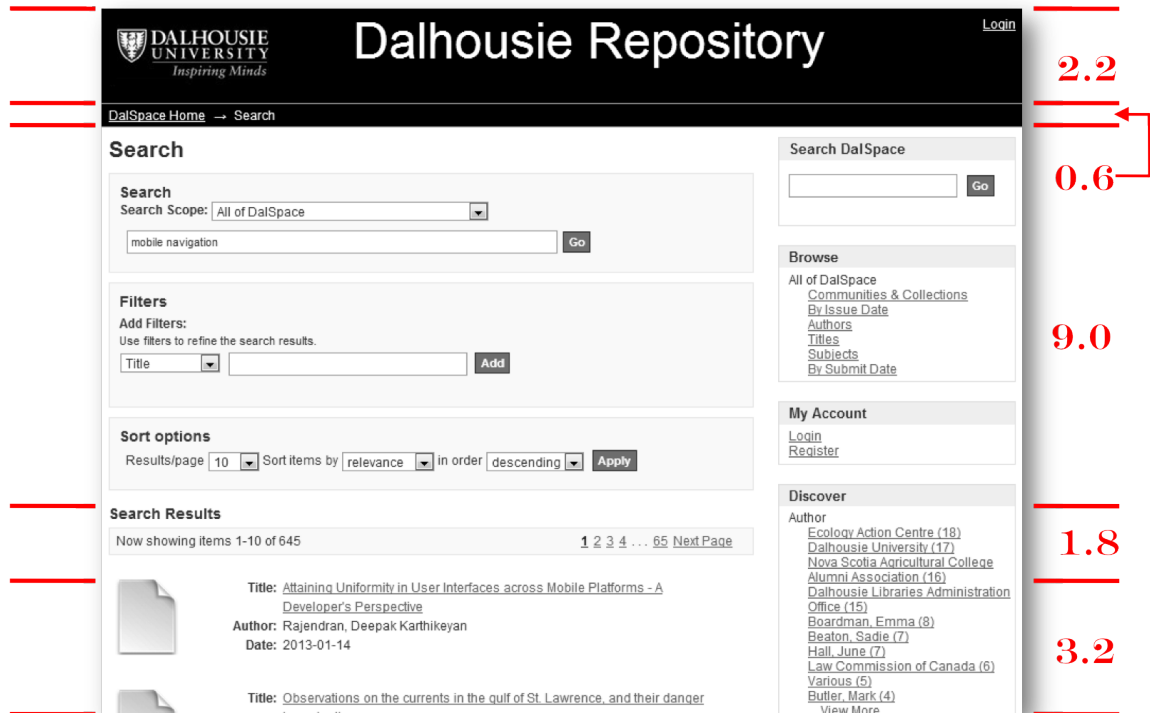


Figure 3.21: Placement of search results with relative vertical sizes

Recommended changes

There are various ways to redesign the interface so that the space needed for the filters does not encroach on the results.

- One method would be to move the filters to the side so that the results would be displayed in a narrower but longer space. That solution would not be particularly suitable for small-screen devices.

- A more suitable method could be to use a type of animated menu that would display filter settings in a short vertical space but could easily be expanded to display the entry fields when the user wanted. The Google search engine currently uses an interface much like that.
- Complex searches are sometimes well-handled with a large interface for entering search terms on one screen, but with a summary of the query in an expression language. We do not think that such an interface would be appropriate for the type of users we expect DalSpace to have, although it might be easy to adapt the library catalogue's back-end to make it function.

3.22 Issue 22: Previous button when uploading a submission

During file upload the previous button works differently than at other times. That button does not return the user to the previous step in the process, rather it causes the WWW browser to refresh the current webpage.

This issue is of great importance. See also §3.25 (p. 35).



Recommended changes

This is a problem that must be fixed.

3.23 Issue 23: Browsing by collection produces a long list of communities and sub-communities

The design of the collections browsing part of the interface is overly complex and lengthy.

The list (shown in Fig. 3.22) is displayed to users who select the *Communities & Collections* link. Most, if not all, users will need to scroll to browse all communities and collections. Furthermore, as one evaluator noted there are 'lots of bold and underlines' which clutter the list.

Recommended changes

Menu design is a complex matter. There are conflicting guidelines for menus in general so we offer two potential solutions.

The main consideration should always be that the structure of the menu help users to make the choice they want with minimal effort and with maximum confidence. This goal is often attempted by organizing menus in ways that make the structure of all of the choices clear to the user.

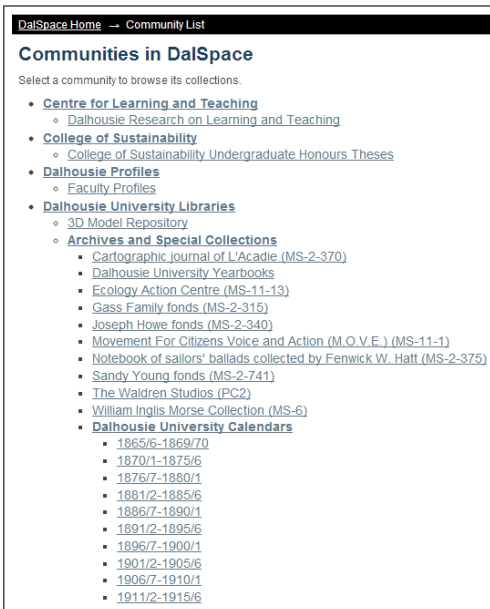


Figure 3.22: Beginning of the long list from browsing by collection

- Hick’s Law suggests an ideal trade-off between breadth (the number of choices presented to the user at a time, i.e. the number of items in a single menu) and depth (the number of menus a user must view to make a selection).

When no other principle applies user interface designers rely on the guideline that there should be between 5 and 9 (7 ± 2) choices per menu and that there should be as many menus as are necessary for all of the options.

- Where there are many items to select from it is sometimes best to show a vast array of options at once.

When this is done with static menus visual grouping techniques are essential to reduce a potentially overwhelming number of choices to what is in effect an display of many submenus at once. Figure 3.23 shows a successful example.

When this is done dynamically the menu becomes an information visualization tool. Shneiderman’s spotfire menus* are a well-known example of how an interactive visual display is used to show and hide available options.

Recommended resource

Shneiderman & Plaisant have specific recommendations for menu design.

*We were unable to locate an image of a starfield menu that we could reproduce in this report.

except to use the browser's back button.

There is no 'undo' option in the interface. Because the breadcrumb menu shows the location of the submission in the collection not the path that the user followed to reach that webpage, that menu cannot be used to jump back one webpage. The type of breadcrumb menu that it used is appropriate and helpful for many tasks but not for this task.

This is a common issue with this type of WWW-based user interface: to make some actions possible the browser is *sometimes* treated as though it is a passive presentation medium — like a monitor for displaying a webpage — for the back-end software; but at (other) times when each webpage can be considered independent the browser, including its Back button, are legitimate parts of the interface.

This inconsistency makes it necessary for users to either understand far more about how the DalSpace interface operates than is necessary or to remember that parts of the interface that are visually similar (and to their mind therefore logically similar) operated differently. As a consequence their cognitive burden is unnecessarily increased and their trust in the system is decreased.

Recommended changes

Since users can reach a webpage by following various links, and because the designers evidently want the users to form a mental map of how the corpus is organized,* then links back to the various places the user could have been presented with in the previous webpage could be a useful addition to the interface so long as the list is brief (7 ± 2 items at most). JavaScript can also be used to insert a back-to-previous-webpage link for users who are browsing with JavaScript enabled in their browser.

3.26 Issue 26: Update button in filters

See also §3.39
(p. 46)

Some evaluators were very confused by the operation of the sophisticated filter controls in the search interface (as shown in Fig. 3.24). The use of filters for such a wide-ranging corpus is essential if users are to make efficient use of search.

There are three sections to the interface each of which corresponds to data that can be sent to the back-end and which will cause the results to be updated. But there are four controls (as highlighted in Fig. 3.25) that the user may need to use when updating their search request. The distinction between the types and rôles of the controls is not clear. The style of the buttons (a rectangular shape with bold white sans serif text on a dark grey background) falsely suggests that there is some common function to all of the controls.

*We consider that the use of location breadcrumbs and the list of communities as evidence that the designers would at least not be surprised if the users could predict where to find documents without needing to resort to searching for exact names.



Figure 3.24: Example of searching using filters

When a user applies a filter and deselects (unchecks) it, the user must also select the update button before submitting the new query using one of the other similarly styled buttons.

Other problems are detailed below in the recommended solutions.

Recommended changes

The filter interface is an important and potentially helpful feature of DalSpace but without an interface that is meaningful to users the feature is wasted. The problem here is not about the aesthetics but about how real users will interpret the interface and then make decisions about how to use it and also how confident they will be in the results that it returns. ☆☆

The three buttons that have the same function could be replaced by one button or at least buttons with the same words.

A general rule that should be violated with caution is to make user interface objects that act the same consistent. This part of the DalSpace interface is a clear example of the rule being violated. All of the following issues should be resolved, perhaps by a new

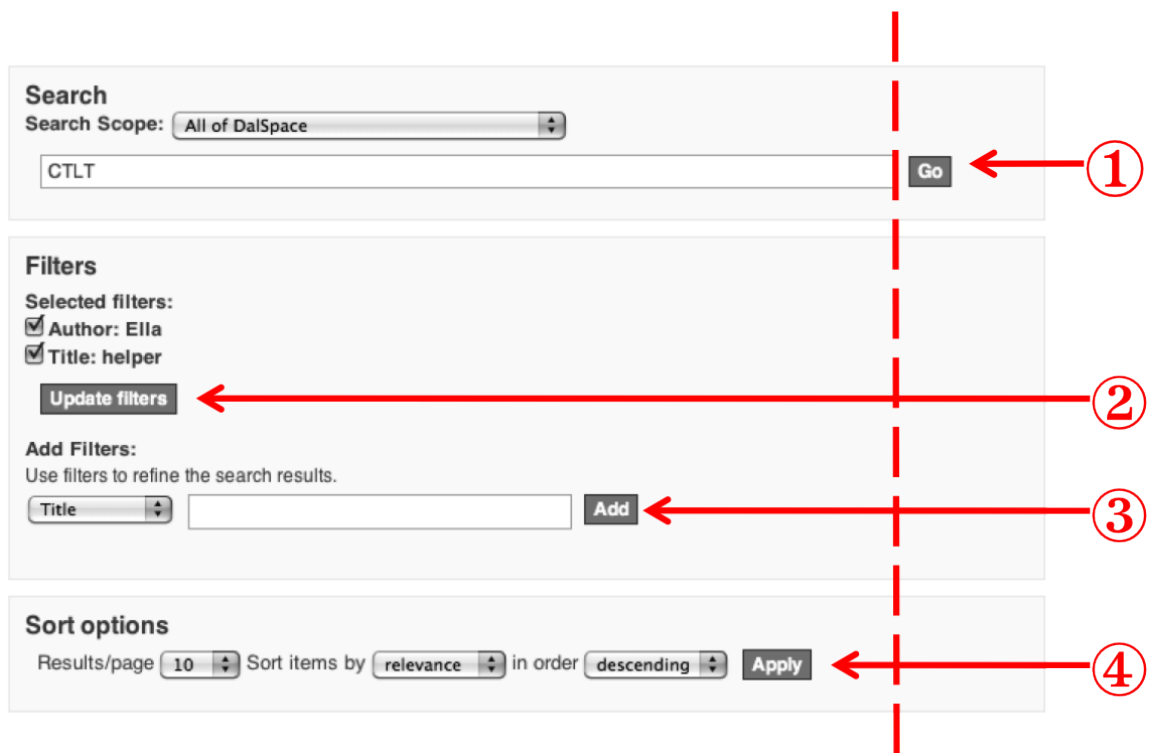


Figure 3.25: Detail of Figure 3.24 (Searching using filters)

design:

1. the controls should be aligned vertically to make their common purpose clear (the vertical line and length of the horizontal arrows in Fig. 3.25 make the difference clear)
2. the controls should consistently be in one line or on multiple lines
 - Go (① in Fig. 3.25) is spread over two lines with a text input field that is much wider than any of the others
 - Update filters (② in the Figure) is is multiple lines and is the only indented control
 - Add and Apply (③ and ④ in the Figure) are both in one line but their functions are unrelated
3. The use of boxes to break up a long form-style interface (such as this one) is often a good technique but it requires that the boxes represent logical units (i.e., everything in a box must be more closely related to everything else in the box than anything outside of the box).

4. The solidus in 'Results/page' although having the advantage of brevity risks confusing users who do not read carefully into thinking that they can jump to 'page 10' (for example) in the results. 'Results per page' is better wording.
5. The semi-sentence order in the 'Sort options' ('Sort items by... in order ...') is confusing. If the sentence style is to be retained then it should read 'Sort items by... in ... order'.

Recommended references

- Robin Williams (2008). *The Non-Designer's Design Book* (Third edition, ISBN 978 0 132 10392 3). Peachpit Press.
- Ben Shneiderman & Catherine Plaisant (2010). *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (Fifth edition, ISBN 978 0 321 53735 5). Addison Wesley Publishing Company Inc.
- Nathan Smith. *960 Grid System* [website]. ([URL:http://960.gs/](http://960.gs/)). See especially the fluid example.

3.27 Issue 27: The Go button in browsing by issue date

Some users are likely to be confused while browsing by issue date (as shown in the example depicted in Fig. 3.26). The Go button seems to be an alternative or non-primary choice since it is introduced by the word 'Or', but the placement of that button is inconsistent with that impression.

Recommended changes

The webpages should have a single consistent style. Users should be able to predict what will happen before they select buttons, but they should never need to understand any of the inner workings of DalSpace's back-end software.

The Go button could appear beside both options (month & year, and year alone) or there could be only one Go button at the bottom right of the controls.

3.28 Issue 28: Browsing by issue date-wrong entry

An evaluator noted that 'selecting a future date such as December 2013* does not alert the user about their non-existence'. Furthermore, the system produces random results if the future date is removed and the Go button is selected.

*Evaluation was conducted in mid 2013.



Figure 3.26: Go and Update while browsing by issue date

Recommended changes

The error could be prevented by warning the user that the data entered is invalid. However we think that might require too many assumptions, such as that pre-print articles could never be deposited.

The system should never produce random results. If the results appear to users to be random then the system's design is failing to help users to build a model of how the system operates that they can use to reason.

3.29 Issue 29: View item-screen

See also §3.22,
§3.25, §3.40
(pp. 33, 35, 47)

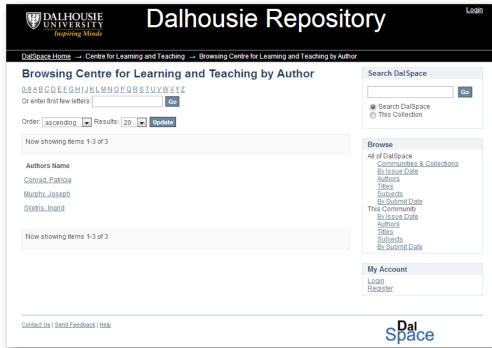
DalSpace updates its webpage in place when showing search results, so there is no easy way for users to return to the list of results.

Recommended changes

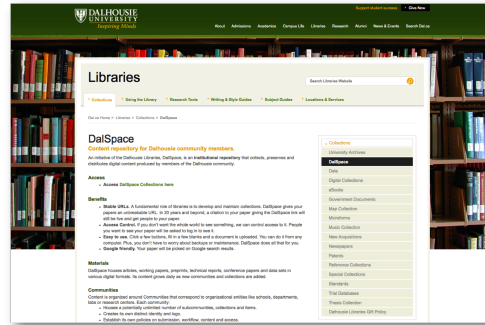
This issue is related to browser vs. in-site navigation. See also issues 22 (§3.22, p. 33) and 25 (§3.25, p. 35).

3.30 Issue 30: Help option

Selecting the *Help* option at the bottom of the homepage (see Fig. 3.27c) seems to take the user away from (or out of) DalSpace.



(a) Design of Typical DalSpace webpage



(b) Design of the Help webpage



(c) Details of *Help* link in the footer of Fig. 3.27a

Figure 3.27: Design of help webpage differs from that of DalSpace

Because the style of the help webpage (which is to be read, not used as a method of input) differs from the style of the other webpages they appear to be different pages. Part of the reason for the different styling seems to be because there are links to the help webpage from other parts of the Libraries' website. This issue is related to how the browser is conceived of by the programmers and end-users as we discussed briefly in §3.25 (p. 36).

Furthermore, evaluators noted that the help and documentation was 'not in sync with the main site' and that they 'cannot type in what kind of help I [they] need'.

Recommended changes

The main contents of the help webpage should be the same whether the user navigates to it from within DalSpace proper or from the Libraries' main page, however the style and navigation specific parts (e.g., the breadcrumbs and local navigation menu) should be different. We think this change could be easily accomplished in the back-end of DalSpace

since the page content should be generated from a database.

The evaluator who reported the problem suggested that ‘a detailed documentation on how to use DalSpace, what features work should be displayed probably in a separate window’.

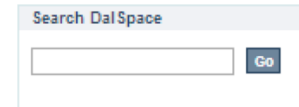
It is not clear from the evaluation precisely what is needed to improve the contents of the help documentation.

3.31 Issue 31: Search ‘This collection’ option

✪✪ In some screens there are two options for searching by keyword: unnamed search (*search all of DalSpace*) and *This collection* as shown in Figure 3.28.



(a) Search in the main webpage



(b) Detail of Fig. 3.28a



(c) Search when browsing a collection



(d) Detail of Fig. 3.28c

Figure 3.28: Different interfaces for keyword search

✪✪ The difference is confusing to users for two categories of reasons:

Issues with vocabulary

- The same title appears in both interfaces although the interfaces themselves are different. The title should be unique.
- The title and one of the options (in Fig. 3.28d) are the same. The words should mean exactly one thing but in this case they must be understood differently.

- One of the radio button options (in Fig. 3.28d) is an action (*search* is a verb) but the other is not.

Navigation and Sense of location

- Although it may seem obvious that the exact meaning of *This collection* depends on which collection the user is browsing, however casual users are confused by anaphoric references and would be unlikely to understand the significance of the page's main heading or breadcrumb trail which are the only visual reminders of what *This collection* refers to.
- An evaluator noted that the term (this collection) 'is meaningless if the user gets there through a thesis title search'.

Recommended changes

Vocabulary should be used consistently and unambiguously.

Action options should use verbs that describe what users can do and nouns tell users what specific instances those actions will operate on. For example: 'Search this collection' or 'Search *in* this collection' is much more meaningful than 'This collection'.

If two parts of an interface have different purposes or act differently then they must have different titles.

Titles and options must have different names but they can be similar. Their purpose is different so the names must be different.

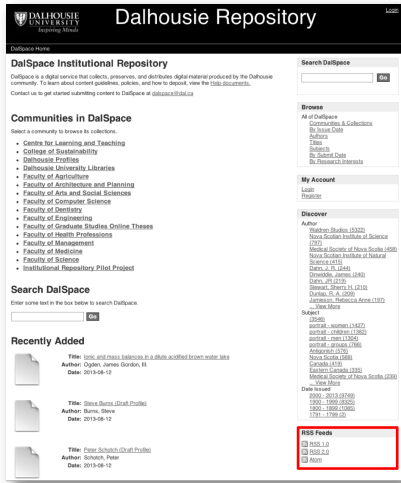
It is best to replace generic or vague terms such as 'this collection' with the name of the actual collection.

3.32 Issue 32: RSS feeds

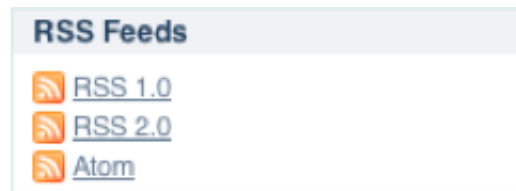
Some users are likely to be confused with the list of three formats of RSS feeds in the main webpage (as shown in Fig. 3.29). Although it is common for RSS feeds to be listed in a sidebar menu in many websites (as DalSpace currently does), the menus are an unnecessary confusion. Users who are familiar with RSS do not require options for all available formats on the main page; other users often do not understand the meaning of the labels. Further confusion can arise because all of the other sidebar menus have titles that indicate actions users may take.

Recommended changes

We recommend having only one link for RSS that will lead to a webpage with a brief explanation of the importance of RSS and links to the three feeds. The link could appear in multiple places on the webpage.



(a) Location of RSS menu in main page



(b) Detail of RSS menu

Figure 3.29: RSS feed menu

3.33 Issue 33: Crowded homepage

Some of the evaluators suggested that there were too many links on the main page which could overwhelm users. In general, we are not inclined to agree. We think that the structure of the webpage is clear and mostly consistent.

Recommended changes

We discuss some general issues with menu design in §3.23 (starting with p. 33).

3.34 Issue 34: Community item breadcrumb list

Some evaluators expected the headings in the breadcrumbs to always be links. Figure 3.30 shows a document record view* that includes links in its breadcrumbs.

This issue is important for two reasons: the system should conform to users expectations unless there is a good reason not to and such links could make navigation easier which would in turn resolve the issues in §3.25 and §3.29.

*The document in Fig. 3.30 has handle <http://hdl.handle.net/10222/35003>.



(a) Links in the breadcrumb part of a full item record



(b) Detail from Figure 3.30a

Figure 3.30: Breadcrumb menu

3.35 Issue 35: Sort the faculty profiles

The faculty profiles are not ideally organized for all users. From the focus groups with student-users we know that such users want to find faculty members by faculty, research area, number of publications, etc. Graduate students in particular are interested in browsing theses supervised and examined by specific professors.

The options referring to 'issue date' and 'subject' are not appropriate for the faculty profiles.

Recommended changes

The faculty profiles might benefit from different sorting options and viewing filters than most other collections. Alternatively, meaningless options could be presented deactivated and not as links ('greyed-out') to maintain some visual consistency amongst the collection views but still show that those options will not operate within this collection.

A good way to ensure that the actual needs of all users are met would be to include a way to dynamically sort the results.

3.36 Issue 36: Adding an extra reader field while submitting

An evaluator notes that 'while design[ing] a submission, I tried to add a new reader without inserting any text. The system did not do anything and not even a response to [the] incorrect action'. That evaluator attempted to include extra fields in a submission without providing any content for the fields.

Recommended changes

If the fields must be completed for the submission to be submitted then the user must be notified of the error. Notifications could be warning messages or a combination of actions and messages such as ‘There cannot be empty fields in submissions, so the following empty fields have been removed...’.

3.37 Issue 37: Colours of visited links

The colour of visited links does not change to indicate that they have been visited. In DalSpace, the unvisited and visited links are light blue while dark blue is used for active links.

Recommended changes

Evidence-based recommendations for which colours to use for links have been changing but experts still agree that visited and unvisited links should have different colours.

Recommended references

- U.S. Dept. of Health and Human Services (2006, updated 2013). Guideline 10:7 Designate Used Links in *The Research-Based Web Design & Usability Guidelines, Enlarged/Expanded edition*. Washington: U.S. Government Printing Office, 2006. [web-page visited 2013-08-12]. (URL:<http://guidelines.usability.gov/guidelines/98>).
- Jakob Nielsen (2004, updated 2013) Jakob Nielsen’s Alertbox: May 10, 2004. [web-page visited 2013-08-12]. (URL:<http://www.nngroup.com/articles/guidelines-for-visualizing-links/>).

3.38 Issue 38: User profile after logging-in with NetID

After users log into DalSpace there is no clear indication which account they are using. Including their name or account ID would help remind users that they are logged in.

3.39 Issue 39: The Add and Apply buttons under *Discover*

Selecting a subject, author, or a date under the *Discover* heading applies the filter immediately but the option then requires users to select either the Apply or Add button to update the filter settings. In other words Add button includes new filters but Apply button is needed to start a search.

Recommended changes

This and other related issues are discussed in §3.26 (starting on p. 36).



3.40 Issue 40: Users' path vs. the document path

The breadcrumb menu shows the location of the current webpage in the structure of DalSpace. Some users would prefer to see their navigation path. We are not certain that this issue is a problem requiring any change to the interface.

Resources

Keith Instone (2004). *Location, Path & Attribute Breadcrumbs*. [⟨URL:http://instone.org/breadcrumbs⟩](http://instone.org/breadcrumbs).

3.41 Issue 41: System suggests 'enter first few letters' to browse by title

Some evaluators thought that there are 'too many options for searching by titles' and that these options might make the interface overly complicated. In browsing by title, the system suggests two options either choosing a starting letter or 'enter first few letters'.

The co-authors of this report disagree whether this is a problem or not.

3.42 Issue 42: Punctuation suggestions in search filters

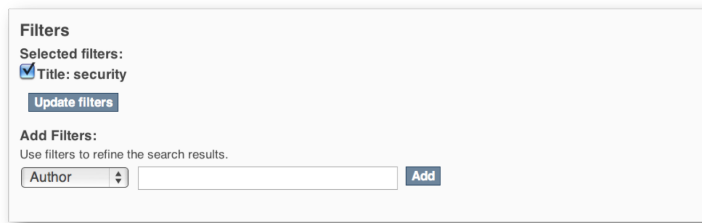
The presentation of first character (digits 0–9 or letters A, B, . . . , Z) is not consistent — the digits are listed as a single range but the letters are discrete. Note that many documents have only numeric titles or titles that begin with numbers.

Recommended changes

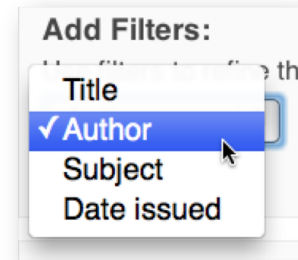
If space is a concern then the letters should also be in ranges (e.g., A–D, E–H). Otherwise SYMBOL or DIGIT could be used in place of '0–9'.

3.43 Issue 43: Behaviour of dropdown menus in filters

When using *Filters* (see Fig. 3.25 on p. 38 and Fig. 3.31) to narrow search results there are options from the dropdown menu for 'Author', 'Title', 'Subject' and 'Date issued'.



(a) Close-up with drop-down menu closed



(b) Drop-down menu open

Figure 3.31: Filter options

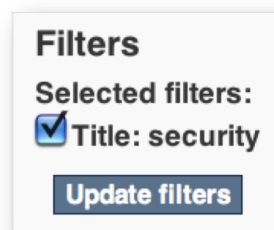
There are two issues: what happens when nothing is entered into the filter's textbox, and what happens when an existing query is un-checked.

3.43.1 Empty filter queries

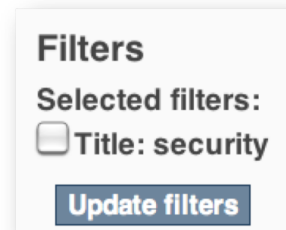
If the user uses the menu to add one of the types of filter but does not enter any text in the textbox then no filter is added for the empty search query.

Some evaluators think users will expect the filter options to remain even if they are empty. We think the current behaviour is best and does not need to be altered.

3.43.2 Deselected (un-checked) choices in filter selection disappear



(a) Selected (checked)



(b) Deselected (un-checked)

Figure 3.32: Checkbox in filter option

Figure 3.31 shows a selected filter for Title with the query text 'security'; Figure 3.32b shows the same filter in its deselected (or un-checked) state. When the user selects the update filters button all deselected filters are removed from the interface.

Suggested solution

By default, the filters should remain displayed because their presence helps users to remember what they are trying to accomplish. There may be a need for a way to remove filters that are no longer needed so they do not clutter the display but the default should not be to delete them.

3.43.3 Drop-down menu erases users' choices

Furthermore, after a query term is entered into the textbox, the drop-down menu presents the choices again in the same order although many users would expect that after they had set the menu to display 'Title' (for example) the menu would continue to display that until they changed it.

Suggested solution

The state of the drop-down menu should not change state without the user explicitly changing it.

3.44 Issue 44: Placement of *Show simple item record* link

In the view item interface, the link *Show simple item record* appears at the top and bottom of the main content portion of the webpage, but on the previous screen the link to *Show full item* is in only one location, namely near the middle of the webpage.

We consider that there is good reason for this seeming inconsistency. This is not a problem.

Recommended changes

However the term 'brief' is a better opposite for full than is 'simple', so we recommend changing the name to 'Brief item view'.

3.45 Issue 45: Auto-fills on search

DalSpace provides query completion suggestions (auto-fill) when filtering but not when searching.

Recommended changes

One evaluator suggested that 'This should be a nice feature to have similar to Google'.

3.46 Issue 46: The number of the documents while browsing by subject

One evaluator found that while browsing by subject, the system shows the number of the items found as '99–103 from 12098' rather than the more common 1–4 of 12098.

Recommended changes

This is a problem that should be fixed.

3.47 Issue 47: Indirect link to download a document

Evaluator noted the indirect steps needed to download documents. Typical comments were 'you have to open and then save. There is no link given to download directly' and 'ability to download is not visible and indirect'.

Recommended changes

This seems to be a WWW browser limitation. However DalSpace would be improved if there were a more direct way to download documents than to go through two steps: view and save.

3.48 Issue 48 (addressed elsewhere)

3.49 Issue 49: Browsing by issue date-wrong entry

There seems to be little or no error checking and correction when entering issue dates for browsing.

Recommended changes

The very least that should be done is to warn the user when the query as entered cannot be interpreted as a date.

3.50 Issue 50 (addressed elsewhere)

3.51 Issue 51 (addressed elsewhere)

3.52 Issue 52 (not addressed)*

3.53 Issue 53 (not addressed)[†]

3.54 Issue 54: Browse an empty collection by subject

Users may be confused when they browse a community to find it is empty — since there is so much framing content (see Fig. 3.33[‡]) users might suspect that if they wait long enough the rest of the content will load. Users are also likely to think of labels as being used to organize materials which are in the corpus not as place-holders for materials which may later be deposited.

Recommended changes

Our suggestions relate to how to help users to conceive of the corpus in a simple way that will help them to use it. If the empty collections are necessary — and we believe they are — then a simple message stating that there are no documents yet in the current collection will help users.

3.55 Issue 55: URL link in the view item page

The *simple item view* (see Fig. 3.34) includes an unlabelled link. An evaluator commented that ‘it does not name an explanation of what it does’ although its location makes it seem important.

Recommended changes

The document handle should have a label just like all of the other data.

*This issue is of at most minor importance and is browser-specific.

[†]This issue is hardware- and operating system-specific.

[‡]The example, in Figure 3.33 is of the Pharmacology collection within the Faculty of Medicine community (at handle <http://dalspace.library.dal.ca/handle/10222/31458>).

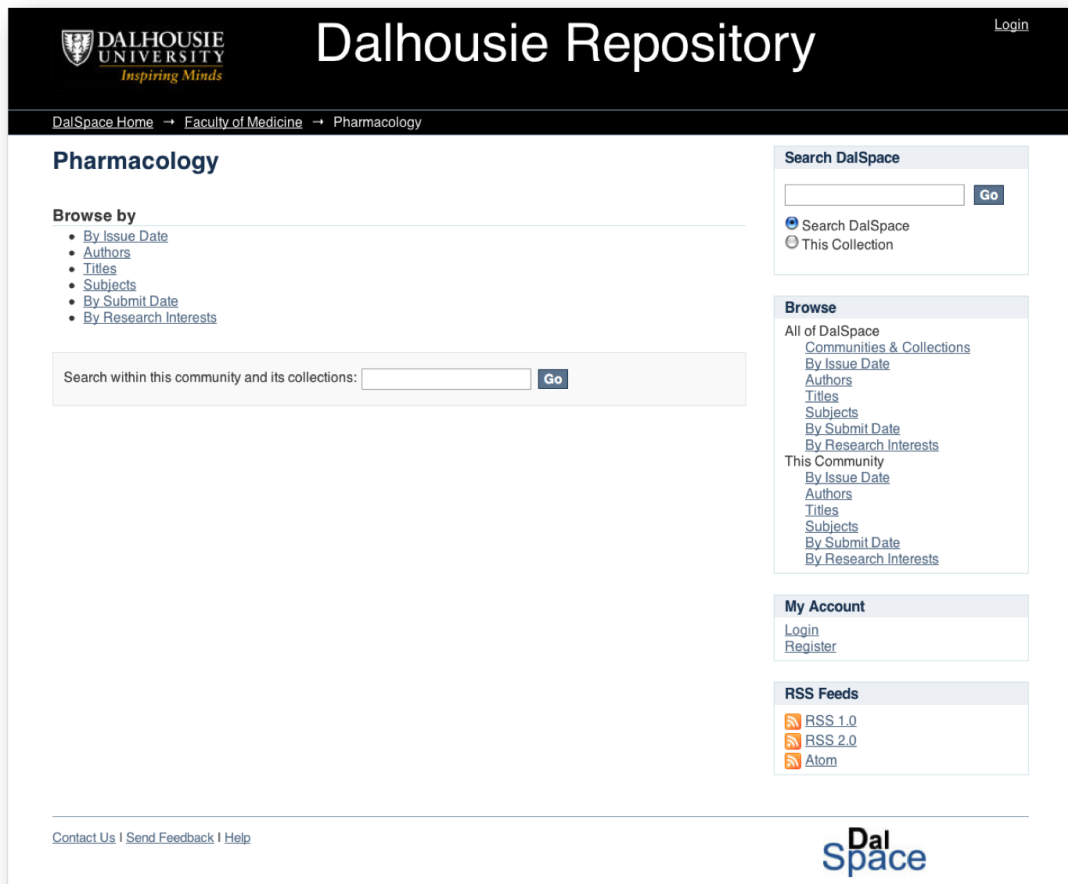


Figure 3.33: A collection without documents

3.56 Issue 56: Reaching the search box through the keyboard

Apparently the DalSpace website uses neither the `tabindex` nor the `accesskey` methods of keyboard-based navigation within a webpage.

Recommended changes

Including some type of keyboard-based enhancements could benefit blind users and 'power' users.



Figure 3.34: Simple item record with an unlabelled datum

3.57 Issue 57: 'Discover' option

The meaning of the title *Discover* on the main page is not clear enough for all users.

Recommended changes

It would be more helpful to make it clearer that the system suggests some filters.

3.58 Issue 58: 'Files in this item' header

The label *files in this item* above documents is insufficient.

Recommended changes

An evaluator suggested 'using another term may help' or an list of the files that document is composed of. We think that at least a count of the number of documents should be provided to users before they follow the link.

3.59 Issue 59: Filter and sort at the same time

An evaluator found that it is impossible to apply filters at the same time as sorting while browsing by submit date. Users have to first enter the year, and select the Go button, before they can sort the results by selecting the Update button.

Recommended changes

The evaluator who reported the issue recommended 'Draw a line between the two to indicate that sorting has to be alone as a next step, or make sorting inactive while filtering is being done.'

Related issues This issue is related to *Issue 5: Insufficient Documentation* and *Issue 9: Seemingly inconsistent search results* (pp. 16 and 20).

3.60 Issue 60 (addressed elsewhere)

3.61 Issue 61 (addressed elsewhere)

3.62 Issue 62: Error messages are not separated from the text

Error messages throughout most of the situations are not separated from the main text in the page design. The system should provide error messages that are precisely worded and clearly noticeable.

Recommended changes

We recommend a different style for error messages using cascading style sheet (CSS) rules*.

*We also recommend using CSS rules to set the background colour of the webpages.

3.63 Issue 63 (addressed elsewhere)

3.64 Issue 64 (addressed elsewhere)

3.65 Issue 65 (addressed elsewhere)

3.66 Issue 66 (addressed elsewhere)

3.67 Issue 67: File icon is generic



Figure 3.35: Examples of file icons in DalSpace

Many of the file icons in the view item display are generic however some match the document type (see Fig. 3.35). It would be helpful to users, if only to break up the visual monotony of the display, to use different icons for each file type or other characteristic. This issue is of very low importance.

Recommended changes

There are many resources about icon design including a webinar in the Libraries collection. The only definite advice we offer is that for icons to be easily distinguishable from each other they should differ by more than just colour and textual label.

3.68 Issue 68: Inconsistent date format displays

Different date formats are used when browsing by date. Figure 3.36 shows some examples.

This issue relates to users' confidence in DalSpace and its ability to find the documents that users need. ☆☆

Recommended changes

This must be corrected. Except in exceptional circumstances, the year should be provided. The dates should have a single unambiguous format. If a date such as '1040' or '213' must

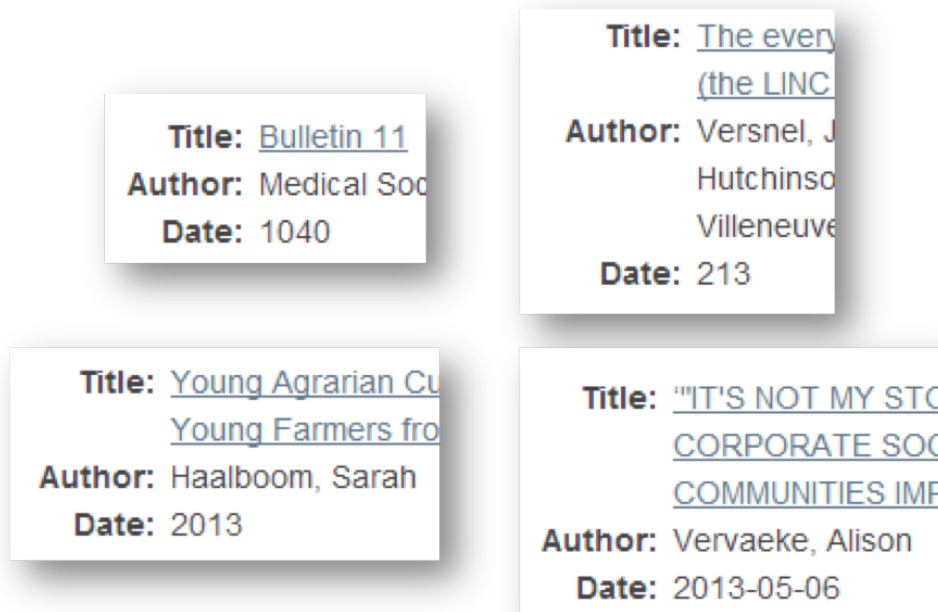


Figure 3.36: Inconsistent date format displays

be used then there should be some explanation or clarification nearby.

3.69 Issue 69 (addressed elsewhere)

Part III

Conclusions

Chapter 4

Summary of commonalities — Recurring themes

Users should not need to understand how DalSpace works for them to use it with confidence. But they should have what Norman calls ‘a good conceptual grasp’ [11, p. 179] of the state of the system, what it is doing, an understanding of the controls they can use, actions they can take and an ability to predict how DalSpace will react to their input. Users ‘need a story that puts together the behavior and appearance of a device in a sensible, comprehensible pattern’ [loc. cit.].

Many of the problems can be traced to how DalSpace is presented to users. Because there is so little instruction about how the controls operate or how the designers expect DalSpace to be used, users form their conception based on experience with systems that appear to be similar (but may be quite different) and cues from the visual layout.

The issues are summarized in the list below:

1. What are the differences between types of search (Search DalSpace or ‘Search This Collection’, Browse, Discover, Filter)?

There seem to be two types of search: keyword or basic search, and filter or advanced search.

Issues #5, #9, and #59 are all related directly to the user’s expectations and how DalSpace could help form them. There is clearly a difference between the two types of searches (see *Issue 9: Seemingly inconsistent search results* on p. 20) but the reason for the difference and of what practical value it is for users is not apparent.

As we noted on page 13 (in the discussion of Issue #1) difficulty searching DalSpace will not be much of a problem if the corpus is searched by another means, e.g. a federated search or a WWW search engine, such as Google.

2. What are the differences between communities, their collections, and the corpus

in general? This question arises particularly when users navigated to the relevant webpage without selecting a collection (see the evaluator's comment in §3.31).

3. There are several ways that the interface does not react in a consistent manner (e.g., *Issue 3: Results of search without query string* on p. 14, and how the browser is used).

The WWW browser software is not treated consistently in all parts of DalSpace's interface. Our discussion of the various inconsistent ways that WWW browser software is treated begins on page 36. See especially *Issue 22: Previous button when uploading a submission* (§3.22, p. 33) and *Issue 25: Browser software's Back button while viewing an item* (§3.25, p. 35).

4. There are some aspects of the interface that make DalSpace more difficult to use for its intended purpose than it should be.

For example, the layout of the controls (*Issue 23: Browsing by collection produces a long list* on p. 33 and *Issue 26: Update button in filters* on p. 36) cause great problems for users. The design not only misleads the user but it lacks consistency. There are lengthy discussions relating to both of those issues in which we recommend changes and refer to suitable resources.

Chapter 5

Most urgent and most important issues

Many of the issues are because users find it too difficult to form a consistent model of how the controls in DalSpace function. Although some of that difficulty could be eliminated with a simple overview in the help documentation users rarely read documentation until they have difficulty so other solutions are preferred.

This chapter includes both urgent and important (but non-urgent) issues.

Some of the issues below appear in more than one category.

5.1 Technical issues

5.1.1 Technical issues

Issue 3: Results of search without query string	page 14
Issue 8: Browse by author name	page 18
Issue 9: Seemingly inconsistent search results	page 20
Issue 13: Inconsistency of <i>View more</i> link	page 25
Issue 22: Previous button when uploading a submission	page 33
Issue 59: Filter and sort at the same time	page 54
Issue 68: Inconsistent date format displays	page 55

5.1.2 Issues requiring straightforward technical intervention

Issue 11: Browse a restricted community	page 23
Issue 12: Browse an empty collection	page 25
Issue 14: Search a keyword	page 27
Issue 27: The Go button in browsing by issue date	page 39
Issue 42: Punctuation suggestions in search filters	page 47
Issue 43: Behaviour of dropdown menus in filters	page 47
Issue 46: The number of the documents while browsing by subject	page 50

5.2 Inconsistencies

Issue 22: Previous button when uploading a submission	page 33
Issue 25: Browser software's Back button while viewing an item	page 35
Issue 30: Help option	page 41
Issue 46: The number of the documents while browsing by subject	page 50
Issue 68: Inconsistent date format displays	page 55

5.3 Interface flaws

5.3.1 General and overall issues

Issue 26: Update button in filters	page 36
Issue 39: Add and Apply under <i>Discover</i>	page 46

5.3.2 Documentation / System image

Issue 5: Insufficient Documentation	page 16
Issue 30: Help option	page 41

5.3.3 General menus and layout

Issue 22: Previous button when uploading a submission	page 33
Issue 23: Browsing by collection produces a long list	page 33
Issue 24: Scope and filters while searching	page 35
Issue 26: Update button in filters	page 36

5.3.4 Breadcrumb menus

Breadcrumb menus can help users to find their way in websites. These menus can help a user to jump to part of a website immediately and they can also help a user to understand the organization of a website. Breadcrumbs are often used in the large websites (such as DalSpace), however they are not suitable for small-screen devices. Although there are at least three types of breadcrumb menu styles [2, 5], some evaluators expected users would be confused by the current style and its lack of consistency.

We strongly recommend that links in breadcrumbs be used consistently. However, we expect that the use of location breadcrumbs [5] will not be a substantial problem for users if other problems are eliminated. We do recommend explaining the breadcrumbs in help documentation.

Chapter 6

Easy fixes

We believe that the following issues could be resolved easily and would make DalSpace much better.

Issue 4: No message when deleting submission	page 15
Issue 18: Non-alphabetic characters in name list	page 30
Issue 25: Browser software's Back button while viewing an item	page 35
Issue 27: The Go button in browsing by issue date	page 39
Issue 31: Search 'This collection' option	page 42
Issue 32: RSS feeds	page 43
Issue 37: Colours of visited links	page 46
Issue 42: Punctuation suggestions in search filters	page 47
Issue 44: Placement of <i>Show simple item record</i> link	page 49
Issue 55: URL link in the view item page	page 51
Issue 62: Error messages are not separated from the text	page 54

Chapter 7

General advice and resources

It bears repeating that DalSpace has many strengths. This report is confined to potential problems with the user experience.

See *Bibliography*
on next page

For general advice about the principles of interface design we recommend the books by Shneiderman & Plaisant [12], Norman [10], and Williams [14]. All three include excellent general guidelines.

The books by Stone et al. [13] and Heim [3] are good introductions to user interface design.

Hofmann has good practical advice about visual principles for design. The reference in the bibliography [4] is to one of two that are available from the Dalhousie Library.

Neither of this report's authors claims to be an expert on information architecture (IA), however it seems clear that that field is particularly relevant to a large website for use by many types of users. We expect that IA resources will be of great use in improving DalSpace's user interface.

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Part IV

Appendices: Typical Users and Tasks

Appendix A

User Profiles

Based on discussions in interviews and focus groups with users and potential users of DalSpace ALJohani generated the following user profiles. Each profile is an example of one of the types of users we expect DalSpace will have. Although not all potential users are described by these profiles we believe that the majority of students are well described by these profiles. These profiles may be used with any non-user (aka discount) testing method.

A.1 Undergraduate Student

A.1.1 Personal Description

Rebecca* is a full-time undergraduate student in the Faculty of Computer Science at Dalhousie University in her second year. She is 20 years-old. She is interested in programming and computer graphics.



A.1.2 Technological Background

Rebecca has a Mac laptop. She is building her technological and programming knowledge through the courses that she studies in the computer science programme. In terms of her web use experience, she has experience surfing websites; however, she is more experienced using Google and Google Scholar to find resources and papers for course work. She is afraid of adopting new systems because she anticipates wasting time learning a new one. If she has any problems with DalSpace, she will abandon the website and use another one instead.

*The photo is used with permission of the image creator, freedigitalphotos.net.

A.1.3 Tasks

What does she want from DalSpace?

- She wants the academic articles and documents to be organized under communities of Dalhousie departments. She needs this feature to assist her in searching for a particular document easily. For example, she needs to check under the Faculty of Computer Science community only to be able to accomplish her assignments. She might use other communities' collections depending on the topic of assignments.
- She wants to be able to read and download digital documents and sometimes able to obtain printed copies for annotation purposes.
- The interface should be easy to explore. She wants to be able to figure out where she is in the website and where to go next.
- She would not use DalSpace until she is required to (download or print) some documents from DalSpace. For example, if a professor asks his/her students to find a particular paper in DalSpace as a part of the course work, only then will she use it; otherwise she usually starts searching using Google and Google Scholar and then proceeds to use any seemingly convenient library resource when she cannot find the desired document.
- She wants to have a personal account to help her manage her documents that would bookmark some for future use.
- She prefers to have access to the content of DalSpace from both home and the university campus.
- In terms of how frequently she will use DalSpace, she will use it whenever needed to accomplish assignments, reports and search for course related work.
- She wants to be able to refine the search results by author's name and date in which the document was issued, as well as title, which would require an advanced search tool.

A.1.4 Current Problem(s)

She does not know about DalSpace and she is wondering if she can have a link in the FCS home page or have someone talk about it on the orientation day. She also thinks that having a tutorial video in YouTube about why and how to use DalSpace with a link on the interface of each faculty would be helpful. She is not aware of other universities repositories that she can use beside DalSpace.

A.1.5 Desires

She wants to be able to upload projects that she completes in every course. She would like to be able to find and access more than academic papers or community collections; she wants to obtain teaching materials, assignments, comments on content, professors' pages and their publications. She needs an automated spelling correction feature in the search bar.

A.2 Masters Student

A.2.1 Personal Description

Thomas* is a Master student in the School of Information Management (in the Faculty of Management) in his first year at Dalhousie. He is 25 years-old.



A.2.2 Technological Background

He has both a personal computer at his desk in the university and a personal laptop. He thinks he has some level of technological experience dealing with websites and searching for academic papers. He is familiar with library and academic database websites. He uses both digital and printed copies of documents. He uses Dalhousie library resources first to find journal articles and uses many free online databases in addition to those in Dalhousie libraries.

A.2.3 Tasks

What does he want from DalSpace?

- He has to submit his Master's thesis through DalSpace, and every faculty has its own preferred thesis structure. This leads him to have some troubles in deciding which format and structure he should follow. Therefore, he wants to find guidelines for thesis structure or a thesis template structure in DalSpace.
- He wants to browse conference papers, published articles and journals that are associated to a certain research group that shares the same interests with him.
- He needs to read a brief description of the document before he downloads or opens it such as the abstract of the document.

*The photo is used with permission of the image creator, freedigitalphotos.net.

- He, as a graduate student, needs to read about specific topics in the Faculty of Information Management to use these documents in his research.
- He is interested in a particular subject which he is studying for his thesis or project. He wants to be updated with a notification of every document in his area of interest that is uploaded to DalSpace. He wants DalSpace to send him an e-mail notification about any new study being uploaded to his community collection.
- As is the case with other graduate students who work under a faculty member's supervision, he wants to explore the theses of students who previously completed studies with his supervisor.
- Sometimes, he needs some papers for his research and cannot find them in Dalhousie library, so he ends up paying extra money to access these documents while DalSpace might be hosting them.
- He wants to have contact with other graduate students in his department who share the same research interests because he wants to exchange knowledge from each others experience.

A.2.4 Current Problem(s)

He did not know about DalSpace until he had to submit his thesis to the graduate studies department through DalSpace, so he thinks that there is a lack of knowledge about DalSpace services. He does not want to waste time searching and not getting the desired results. Therefore, he would like to have advanced search features that help him to find a particular paper in a short time. In addition, he is frustrated when he cannot access a full text journal article. He does not want to pay extra money to access academic papers that could be and perhaps should be in DalSpace.

A.2.5 Desires

He would like to have a personal account that supports managing features to help him create his own e-shelf. He would like to have a list of libraries and databases that Dalhousie students have the ability to access without paying extra charges. He prefers to share various types of papers on DalSpace, such as studies and data. He would like to have a tutorial on how to use DalSpace because he needs to access the online thesis collection. He would like to have someone who can help graduate students to find documents through something like a live on-line chat service.

A.3 Doctoral Candidate

A.3.1 Personal Description

Ishaan* is a non-Canadian student, who has just joined the PhD programme in Computer Science at Dalhousie where he also earned his master's degree. He has to follow a certain plan to be able to earn the degree, which includes two graduate courses, research aptitude defense, proposal defense and the final PhD defense. He is 26 years-old. He has a strong level of writing and reading academic papers. The use of DalSpace is mandatory for submitting his thesis to the graduate studies department to be approved.



A.3.2 Technological Background

Ishaan is skilled in dealing with computers and surfing resources websites and libraries. He has advanced web experience. He is used to retrieving scholarly articles through Google, Google Scholar, Dalhousie libraries, and other online databases. He is planning to be a teaching assistant (TA) for one of the first-year computer science courses.

A.3.3 Tasks

What does he want from DalSpace?

- E-mail alerts of upcoming conferences that are related to his interests or communities. This will help graduate students to be updated about the upcoming conference where they might be interested in publishing their work with.
- He wants to be able to publish his research and studies. He thinks that DalSpace should have an editing tool for academic papers to check the style and the structure.
- He wants to have access to DalSpace collections from both home and the university campus.
- He needs to have a wide range of resources in a variety of departments to assist his research. Therefore, he wants to be able to have a list of all available academic resources associated with DalSpace.
- He needs to know if DalSpace is associated with other university repositories in order to help him in accessing those universities' collections.

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- To upload a thesis, it must be a PDF file. He needs a PDF/A converter application to help him convert files and make sure that the style of the document does not change if processed to accessed in future. Currently DalSpace only accepts PDF files.
- An advanced search function is essentially required for all PhD students because they want to enter the name of the professor or a supervisor to retrieve all publications and theses under his/her name.
- He wants to contribute/receive variety of documents such as PhD theses, research aptitude papers, and proposal papers.

A.3.4 Current Problem(s)

He needs to use DalSpace to find all the theses he wants to read. However graduate students work under faculty member supervision and they want to explore the other students' theses who worked with the same supervisor. However, the only way to reach these theses is to open each document in DalSpace and check the committee signatures. Unfortunately, some theses do not have the signature. He, as a graduate student, wants to work sometimes as TA, so he needs to be aware of all services offered by DalSpace.

A.3.5 Desires

He wants to be able to have some templates or samples of document structures needed in the PhD programme, such as research aptitudes, proposals, and thesis templates. He wants to have the ability to convert files and upload them without wasting time and having technical difficulties. He needs to be able to find all the information that helps him proceed and successfully complete the degree in DalSpace.

A.4 Librarian

A.4.1 Personal Description

Dona* is a collections and reference librarian who has worked at Dalhousie University for more than 10 years. She was involved in the prototype of DalSpace in 2007 where the goal was to create a website that holds the scholarly output of Dalhousie communities. She participates in digitizing collections that are related to the library and stores them in DalSpace. Using DalSpace is not mandatory in her job since it is members of the scholarly communities, not the collections librarians, who decide what to deposit in DalSpace.



A.4.2 Technological Background

She is well-trained and experienced in ‘surfing’ and searching websites. She is aware of other repositories and she uses them often, especially when she has a request of a certain document from other universities. She can be considered to represent three different types of end-users because she deposits materials as a staff member, deposits her own materials, and searches materials. The three users that this profile represents are (1) depositor staff member, (2) researcher and (3) an ordinary end-user.

A.4.3 Tasks

What does she want from DalSpace?

- She uses DalSpace to search for materials such as historical texts that have been digitized, graduate theses, and proceedings of Nova Scotia Institute of Natural Science.
- She is interested in searching for certain authors and scientists who lived and conducted some research in Nova Scotia 60 to 100 years ago.
- Advanced search fields are essential for producing precise results because she is interested in searching the content within documents not only subjects and titles.
- She wants to be able to send e-mail to the authors of some documents if they have put some restrictions on the document.
- She wants to search different documents and formats, such as audio files, because most of the documents in DalSpace are in text-based PDF files.

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- She wants to have a level of visual presentation. For example, a photograph of the individual biographical sketch which will make the interface more attractive.

A.4.4 Current Problem(s)

Librarians can be considered as searchers and depositors in DalSpace. In terms of being a searcher, some of the fields of the advanced search features exist, but she is not sure if they are working because the results do not change after applying them. In her opinion, DalSpace's search function matches only the headings or titles of documents but does not check the information within the record. In addition, it is vital to consider the date at which a particular paper was read publicly. If she wants to read documents that were read publicly in June of 19xx to rate them or check the reviews, DalSpace does not support this feature.

All the theses that are stored in DalSpace are organized under the heading 'online theses collection'. She thinks that every thesis should be mapped to its community or department. For example, if the thesis is in the field of computer science, it should be under the collection of computer science, not under the graduate studies collection. She thinks that the online theses collection is a vast 'mishmash' of all theses that should be more organized and mapped to the proper departmental collections.

Not all students know that DalSpace hosts most of the graduate theses. Therefore, she suggests that the graduate coordinators or supervisors inform students about DalSpace and how they can find the documents. Students should be aware of repositories because researchers put all their work in these places and this can help them find papers without paying extra money. Graduate students should have tutorials on the depositing process. However, she strongly recommends that the search mechanism be reviewed before teaching students how to use DalSpace.

A.4.5 Desires

An important feature that DalSpace should support is rating the documents so that other students, faculty members or staff of any type can see other's reviews. She thinks having a statistical package that DalSpace supports is vital because it documents the number of clicks on a certain record, the number of people who are interested in it and most, importantly, from where these people and clicks are coming. Having the statistical information will help Dalhousie to substantiate the links between the university and other researchers from other countries, and encourage graduate students to be part of the Dalhousie community. This information could help if it were represented in the website for all users to show which are the heavily accessed documents that they might be interested in.

She thinks that having links in the department website that direct not only to DalSpace but also to the theses collection which are related to that department is a good idea. This

will help students to go directly to the relevant area of their interests. Moreover, providing Facebook and Twitter icons in every document in DalSpace would help people to promote their papers. For other people, they can easily find who share the same interests with them, which will create an interaction between the content and students.

Appendix B

Task Scenarios

B.1 Overview of Tasks

ALJohani designed tasks that focus on the most important elements that were derived from the 'User Profiles' study. The tasks descriptions could be used in any non-user (aka discount) testing methodology.

ALJohani categorized tasks as one of the three types in Table B.1. The Tables which follow that one provide a brief description of each task. The following sections describe the tasks in more detail.

The tasks below are reproduced verbatim from ALJohani's thesis [1]. Only the formatting has been changed.

Type	Description
C	Critical task a task that must be successful for the system not to be a failure
I	Important task a task that would justify the system to users
R	Regular task a task that users would do every time they login to the system

Table B.1: Legend of tasks types

#	Name	Type*	Scenario
1	Find DalSpace	I	You want to use Dalhousie repository website (DalSpace) for the first time to search and browse the university collections.
2	Search		subtasks are listed in Table B.3
3	Browse		subtasks are listed in Table B.4
4	Account		subtasks are listed in Table B.5
5	Submission	I	Submit a thesis to the Faculty of Graduate Studies Online Thesis Collection.
6	Restricted Content	C	Browse and Search for restricted content. <i>Note: there are two parts to this task.</i>

Table B.2: List of tasks

#	Name	Type*	Scenario
2	Subtasks of Search		
.1	Search for a thesis by title	R	You have opened the home page for the Dalhousie repository website and want to search for a keyword/thesis. You will take a quick look at the home interface and choose one of the search bars to type in the 'NFC-Enabled Smartphone Application for Drug Interaction and Drug Allergy Detection'. Explore the results and try to read the abstract of the document.
.2	Search within a scope	R	Now you know how to perform a simple search task. You want to refine your search results and focus on only a specific community (Faculty of Computer Science).
.3	Apply filters to the search results	R	After you performed the simple search task, now you need to refine the search to get more precise results. You want to use some filters and refine by the title/ date issued/subject/author of the document one at time.
.4	Apply sort options to the search results	R	After you performed the simple search task, you want to refine the search to get more precise results. You want to apply some sort options, such as by relevance, issue date, title, and order.
.5	Download/Open Task	I [†]	Now you have reached the document that you think you are really interested in. You want to download it and save a copy in your computer to read it later or use it in your work.

Table B.3: List of search subtasks

[†]Task #2.5 can be considered a subtask of all the tasks.

#	Name	Type	Scenario
3	Subtasks of Browse		
.1	Communities' collection from right side.	I	You want to explore/browse specific community collections and have the chance to see the list of all communities and sub-communities. <i>Note: there are two parts to this subtask.</i>
.2	Browse by issue date	I	You are now in the 'browse' interface and you want to browse the repository collections by the issue date. To do so, you need to choose a month and a year from the drop menus. Or you can write the year in the text box if you only know the year.
.3	Browse by author name	I	You are now in the 'browse' interface and you want to browse the repository collections by the authors' names. You need some documents for a particular author and encouraged to enter first few letters of the author's name to have more precise results.
.4	Browse by document title	R	You are now in the 'browse' interface and you want to browse the repository collections by the document title. You are encouraged to enter first few letters of the document title to be more specific if you do not know the whole title.
.5	Browse by subject	I	You are now in the 'browse' interface and you want to browse the repository collections by the documents' subjects. You want to browse the document within the subject 'Human Computer Interaction'.
.6	Browse the submit date of the document	R	You are now in the 'browse' interface and you want to browse the repository collections by the document submit date.

Table B.4: List of browse subtasks

#	Name	Type	Scenario
4	Account Subtasks		
.1	Login using NetID Authentication	C	You want to log in to the system to create your own profile to start exploring the collections.
.2	Register as a new user	C	You are not a Dalhousie member and do not have a Net ID. You need to register to log into the system.
.3	Login using Registered Users Password Authentication	C	You are already registered user and you want to log into the system.
.4	Password reset	C	You forgot the password and want to reset it to be allowed to login to the system.

Table B.5: List of account subtasks

B.2 Task #1: <find the DalSpace homepage>

Goal This task helps users to know exactly where to go to find the DalSpace website.

Type Regular Task

Assumptions The user needs to know that DalSpace is part of The Dalhousie library collections

Steps (use case)

1. The user has to open the library website <URL:http://libraries.dal.ca/> and click on collections.
2. The user has to scroll down to find DalSpace link
3. The user has to click on the DalSpace link
4. The system will take the user to a new interface that has general information about what DalSpace is and how to gain access to the collections.
5. The user has to click on 'Access DalSpace Collections here' to go to the homepage of Dalhousie repository website.

Potential Problems The user might expect to have a direct link at the community website.

Scenario You want to use Dalhousie repository website (DalSpace) for the first time to search and browse the university collections.

Notes None

B.3 Search Tasks

B.3.1 Task #2.1: <Search for a keyword/thesis Title>

Goal The goal is to walk the user through the basic steps of searching using the main interface before logging into the system

Type Regular Task

Assumptions

- Users should decide which search bar to use since there are two: one in the top right and the other one between the text in the middle of the homepage.
- The system might return with no search results.

Steps (use case)

1. The user types the keyword/thesis that he/she wants to search about in one of the search bars in the main menu. And hits the GO button.
2. The system automatically displays the search results interface.
3. The user has to scroll down to see the search results because the system offers some search filters and other ways to reduce the scope of search.
4. The list of documents is presented.
5. The user has to click on one of the documents.
6. The user clicks on the desired document.
7. The system automatically displays the document information (title, author, date posted, URL, name, description, size and type of the file).
8. The user scans the abstract.

Potential Problems

Alternative Cases:

- 6.1 If the user is not interested in any of the documents, then search anew or refine the search.
- 8.1 after reading the abstract, if the user is interested, go to Task #6 (Download a file/document in §B.3.5 on page 85).

Scenario You have opened the homepage for the Dalhousie repository website and want to search for a keyword/thesis. You will take a quick look at the home interface and choose one of the search bars to type in the 'NFC-Enabled Smartphone Application for Drug Interaction and Drug Allergy Detection'. Explore the results and try to read the abstract of the document.

Notes

- User might want to do more than one task at this point. Searching and refining or deciding a specific community. Therefore, all these three subtasks fall in the main task, which is searching a keyword/thesis.
- Users are using the public interface. No need to login at this point.

B.3.2 Task #2.2: <Search-Scope>

Goal The goal of this task is to refine the search by choosing the desired scope from the drop-down menu to choose community or collection.

Type Regular Task

Assumptions Some of the search results do not appear automatically. Users must click on the some buttons to perform the task, such as the GO button.

Steps (use case)

1. Type in a keyword to search for and press the GO button. (Task #1)
2. The system automatically displays the search results interface.
3. The interface contains some search refinement options.
4. The user will choose a search scope from the drop menu.
5. The user has to click on the GO button to get the results after refinement.
6. The system does the changes and displays the search results.
7. The user needs to scroll down to see the results because there are some other refinement options in the top of the page.

Potential Problems The user might think that as soon as they choose the refinement option the new search results would appear.

Scenario Now you know how to perform a simple search task. You want to refine your search results and focus on only one specific community that is 'Faculty of Computer Science'.

Notes

- This task can be performed with Task #1. It is up to the user if he or she wants to refine the search from the start point (all at once).
- Users are using the public interface. No need to login at this point.

B.3.3 Task #2.3: <Search-Filters>

Goal The goal is to add some filters to the search results either before exploring search results or after.

Type Regular Task

Assumptions The user has to click the GO button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. Type in a keyword to search about and hit the GO button.
2. The system automatically displays the search results interface.
3. The interface contains some search refinement options.
4. The user will choose a search filter from the drop-down menu which contains author, date issued, title and subject.
5. The user has to click on the GO button to get the results after refinement.
6. The system does the changes and displays the search results. The user needs to scroll down to see the results because there are some other refinement options in the top of the page.

Potential Problems

- The user might think that as soon as they choose the refinement option the new search results would appear.
- The filters cannot be applied all of them at once because the user can apply one at a time from the drop menu not text box.

Scenario After you performed the simple search task, now you need to refine the search to get more precise results. You want to use some filters and refine by the title/date issued/subject/author of the document one at time.

Notes

- This task can be performed with Task #1. It is up to the user if he or she wants to refine the search from the start point (all at once).
- Users are using the public interface. No need to login at this point.

B.3.4 Task #2.4: <Search-Sort options>

Goal The goal of this task is to sort the search results.

Type Regular Task

Assumptions The user has to click the **APPLY** button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. Type in a keyword to search about and hit the **GO** button.
2. The system automatically displays the search results interface.
3. The interface contains some search refinement options.
4. The user will choose a sort option from the box which contains Results per page, Sort items by relevance, title or date issued, and the ascending and descending order
5. The user has to click on the **APPLY** button to get the results after refinement.
6. The system does the changes and displays the search results. The user needs to scroll down to see the results because there are some other refinement options near the top of the page.

Potential Problems The user might think that as soon as they choose the refinement option the new search results would appear.

Scenario After you performed the simple search task. You want to refine the search to get more precise results. You want to apply some options, such as sort by relevance, issue date, title, and order.

Notes

- This task can be performed with Task #1. It is up to the user if he or she wants to refine the search from the start point (all at once).
- Users are using the public interface. No need to login at this point. Download/Open Task:

B.3.5 Task #2.5: <Download a file/document>

Goal To download a file from the repository website.

Type This is a sub-task of all the sub-tasks 1.1, 1.2, 1.3 that belongs to task #1.

Assumptions User needs to perform one of these tasks 1.1, 1.2, 1.3 to be able to perform this task.

Steps (use case)

1. The user clicks on the link that he or she is interested in.
2. The system automatically views the document information.
3. The user has to scroll down and click on View/Open link.

4. A pop-up window appears asking the user if he or she wants to view the document online or to download it.

Potential Problems N/A

Scenario Now that you have reached the document that you think you are really interested in, you want to download it and save a copy in your computer in order to read it later or use it in your work.

Notes

The user has the ability to view the document online or download it. At this point user does not have to login if the document is open to the public and there are no restrictions on it.

B.4 Browse Tasks

B.4.1 Task #3.1(a): <Using the browse menu>

Goal The goal of this task is to browse and search within a specific community collection using the browse menu.

Type Important task

Assumptions

User has two options to start browsing any community's collection.

There are no rules to follow.

This task is similar to the search task except the system offers browsing the collections in general.

Steps (use case)

1. The user has to select the first option 'communities and collections' from the browse menu in the right-side of the Dalhousie repository homepage.
2. The system will take the user to a new interface called 'Community List' which contains a list of all communities and their sub-communities.
3. The user selects one of these communities.
4. The system offers to browse by the issue date, author, title and subject. The system also displays the community's recent submissions, and search bar.

Potential Problems The user might get confused when to use the browse menu and when to use the search bars to explore and search within one community because using the search bar offers searching in a specific community.

Scenario You want to explore/browse specific community collections and have the chance to see the list of all communities and sub-communities.

Notes

- This feature helps the user when they know exactly which community he/she wants to search.
- I did not focus on how to refine the search or the browse because detailed steps were done in Task 1.1.2 in refining the search results.
- If the user is interested in a particular document in a specific community, he/she can download it by performing Task 1.1.4

B.4.2 Task #3.1(b): <Using the list of communities>

Goal The goal of this task is to browse and search within a specific community collection using community list.

Type Important Task

Assumptions

- User has two options to start browsing any community's collection.
- There are no rules to follow. This task is similar to the search task except the system offers browsing the collections in general.

Steps (use case)

1. The user has to select one community from the 'Community List' in the left side of Dalhousie Repository homepage, which contains a list of all communities and their sub-communities.
2. The system will take the user to a new interface that offers to browse by the Issue date, author, titles and subjects. The system also displays the community recent submissions, and search bar.

Potential Problems The user might get confused and ask the question why there are two options 'Browse Menu and Community List' to perform the same task which is browsing and searching within one community.

Scenario You want to explore/browse specific community collections and have the chance to refine the search within that community using the community list.

Notes

- This feature helps the user when the user knows exactly which community he/she wants to search.
- I did not focus on how to refine the search or the browse because detailed steps were done in Task 1.1.2 in refining the search results.
- If the user is interested in a particular document in a specific community, he/she can download it by performing Task 1.1.4

B.4.3 Task #3.2: <Browsing the repository collection by the issue date>

Goal The goal is to browse the repository collections by the issue date.

Type Important Task

Assumptions The user has to click the GO button and the UPDATE button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. The user has to select the second option 'By Issue Date' from the browse menu on the right side of the Dalhousie repository homepage.
2. The system will move to a new interface that contains the documents arranged in ascending order and two drop-down menus to choose the specific month and year.
3. The user has to select a specific month and year.
4. The user has to click on the GO button to update the list of documents.
5. If the user is interested in changing the order from ascending to descending they can from the sort option.
6. The user has to click on the UPDATE button to display the changes.
7. The user has to scroll down to explore the documents.

Potential Problems The user might think that as soon as they choose the date (a month and a year) the new search results would appear automatically.

Scenario You want to browse the repository collections by the issue date. To do so, you need to choose a month and a year from the drop menus. Or you can write the year in the text box if you know the only the year.

Notes N/A

B.4.4 Task #3.3: <Browsing the entire collection by author name>

Goal The goal is to browse the repository collections by the issue date.

Type Important Task

Assumptions The user has to click the GO button and the UPDATE button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. The user has to select the third option 'By Authors' from the browse menu in the right side of the Dalhousie repository homepage.
2. The system will move to a new interface that contains the documents arranged in alphabetical order and a drop-down menu to choose the preferred order (descending or ascending).
3. The user has to enter first few letters of the author's name.
4. The user has to click on the GO button to update the list of documents.
5. If the user is interested in changing the order from ascending to descending they can from the sort option.
6. The user has to click on UPDATE button to display the changes.
7. The user has to scroll down to explore the documents.

Potential Problems The user might think that as soon as they type the first letters the new search results would appear automatically. Time for expert 1 minute and 30 seconds.

Scenario You want to browse the repository collections by the authors' names. You need some documents for a particular author and are encouraged to enter first few letters of the author's name to have more precise results.

Notes

There are "'letters" links' in the top of the page which allow the user to browse the documents with the author's name that start with these letters.

B.4.5 Task #3.4: <Browse the repository collection by title>

Goal The goal is to browse the repository collections by the title of the document.

Type Important Task

Assumptions The user has to click the GO button and the UPDATE button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. The user has to select the fourth option 'By Titles' from the browse menu in the right side of the Dalhousie repository homepage.
2. The system will move to a new interface that contains the documents arranged in alphabetical order and a drop-down menu to choose the preferred order descending or ascending.
3. The user has to enter first few letters of the document title.
4. The user has to click on the GO button to update the list of documents.
5. If the user is interested in changing the order from ascending to descending they can from the sort option.
6. The user has to click on the UPDATE button to display the changes.
7. The user has to scroll down to explore the documents.

Potential Problems The user might think that as soon as they type the first letters the new search results would appear automatically.

Scenario You are now in the 'browse' interface and you want to browse the repository collections by the document title. You are encouraged to enter first few letters of the document title to be more specific if you do not know the whole title.

Notes

There are "'letters" links' in the top of the page which allow the user to browse the documents that the title starts with these letters.

B.4.6 Task #3.5: <Browse the repository collection by subjects>

Goal The goal is to browse the repository collections by the subject of the document.

Type Important Task

Assumptions The user has to click the GO button and the UPDATE button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. The user has to select the fifth option 'By Subjects' from the browse menu in the right side of the Dalhousie repository homepage.
2. The system will move to a new interface that contains the documents arranged in alphabetical order and a drop-down menu to choose the preferred order descending or ascending.

3. The user has to enter first few letters of the document subject.
4. The user has to click on the GO button to update the list of documents.
5. If the user is interested in changing the order from ascending to descending they can from the sort option.
6. The user has to click on UPDATE button to display the changes.
7. The user has to scroll down to explore the documents.

Potential Problems The user might mistakenly think that as soon as they type the first letters the new search results would appear automatically.

Scenario You are now in the 'browse' interface and you want to browse the repository collections by the documents' subjects. You want to browse the document within the subject 'Human Computer Interaction'.

Notes

There are "'letters links' in the top of the page which allow the user to browse the documents that the subject starts with these letters.

B.4.7 Task #3.6: <Browsing the repository collection by submission date>

Goal The goal is to browse the repository collections by the submit date of the document.

Type Regular Task

Assumptions The user has to click the GO button and the UPDATE button to show the updated results. The system will not automatically perform the changes after selecting a particular filter.

Steps (use case)

1. The user has to select the sixth option 'submit date' from the browse menu in the right side of the Dalhousie repository homepage.
2. The system will move to a new interface that contains the documents arranged in alphabetical order and a drop-down menu to choose the preferred order descending or ascending.
3. The user has to enter the month and the year of the submission date.
4. The user has to click on the GO button to update the list of documents.
5. If the user is interested in changing the order from ascending to descending they can from the sort option.
6. The user has to click on the UPDATE button to display the changes.
7. The user has to scroll down to explore the documents.

Potential Problems The user might think that as soon as they type the first letters the new search results would appear automatically, which is not true.

Scenario You are now in the 'browse' interface and you want to browse the repository collections by the document submit date.

Notes

There are letters' links in the top of the page which allow the user to browse the documents that the subject starts with these letters.

B.5 Account Tasks

B.5.1 Task #4.1: <Login via Net ID Authentication>

Goal Logging into the system to see the restricted content.

Type Unusual but Critical Task

Assumptions To use this option of the login method, the user has to be a Dalhousie students/member with valid NetID.

Steps (use case)

1. The user clicks on the login link in the right top of DalSpace main interface.
2. The system automatically moves to a new interface that consists two login options: NetID Authentication and Registered Users Password Authentication.
3. The user clicks on NetID Authentication.
4. The system automatically moves to a new interface that asks the user to enter the username and the password.
5. The user has to click on sign in button to login.
6. The system displays the DalSpace main interface.

Potential Problems It is important step if the user is interested in submitting a thesis. In terms of the search results.

Scenario You want to login to the system to create your own profile to start exploring the collections.

Notes

There is not a clear difference between logging-in and exploring the system from the public interface.

B.5.2 Task #4.2: <Register as a new user>

Goal Register as a new user

Type Unusual but Critical Task

Assumptions Any user can register for access to the collections. The user does not have to be member of the Dalhousie community.

Steps (use case)

1. The user clicks on register link in the right of the DalSpace main interface.
2. The system automatically moves the user to 'New user registration' interface.
3. The user has to follow a three steps procedure. The first step is to type in the e-mail address that will be used as a username.
4. The second step is to fill the information for the user profile.
5. The user will receive an e-mail that confirms registration.

Potential Problems N/A

Scenario You are not a Dalhousie member and do not have a NetID. You need to register to log into the system.

Notes

End users from around the world can register to explore the content but they can explore most of it from the public interface which draws the attention to the reason behind asking end user from around the world to register.

B.5.3 Task #4.3: <Login using Registered User's Password Authentication>

Goal The goal of this task is login as a already registered user

Type Unusual but Critical Task

Assumptions To perform this task, users have to be registered in the system.

Steps (use case)

1. The user clicks on the Log In button in the right menu at the DalSpace main interface.
2. The system will automatically move the user to a new interface that contains two options: NetID Authentication and Registered Users Password Authentication.
3. The user clicks on Registered Users Password Authentication.

4. The user enters a valid e-mail address and a password.
5. If the user forgot the password: go to Task 1.3.4 to reset the password.
6. The user has to click on sign in to login the system

Potential Problems Users might forget the password. When they do so, they need to click on the link to

Scenario You are already registered user and you want to login to the system.

Notes

Registration is important to allow users to subscribe to collections for e-mail updates, and submit new items to DalSpace.

B.5.4 Task #4.4: <Password reset>

Goal To reset the password in case it has been forgotten

Type Unusual but Critical Task

Assumptions N/A

Steps (use case)

1. If the user forgot the password, he/she should click on the link '*Forgot your password*' to go through three main steps to reset the password.
2. First the user has to type in the same address used when registering and click send info button.
3. An e-mail will be sent to the e-mail containing a special URL and further instructions.
4. The user will receive an e-mail 'Change Password Request'
5. The user has to click on the link in the received e-mail to follow the instruction
6. The link will move the user to the 'Reset password' interface that contains the e-mail and two text boxes to fill in with the new password and confirmation (password should be at least six characters long).
7. The user has to click on the reset password button to confirm changes.

Potential Problems They need to have a verified e-mail account to be able to receive the e-mail notice for resetting the

Scenario The user forgot the password and wants to reset it to be allowed to login to the system.

Notes None

Task #5: <Submission>

Goal To submit a document and upload it to DalSpace

Type Not Usual but critical

Assumptions Graduate students have to use DalSpace to submit their graduate thesis to the Graduate Studies.

Steps (use case)

1. The user has to login to the system.
2. A new link will appear under Account menu called 'submissions'
3. The user has to click on '*submissions*'
4. The system automatically moves the user to the 'Submissions & workflow tasks'
5. The user has to click on start a new submission to start the process.
6. The user has to choose which collection to submit an item to. However, the system does not provide other choices rather than 'Faculty of Graduate Students Online Theses' and click the NEXT button.
7. The system shows the 'Describe Item' form that the user should fill-in with information about their submission.
8. The system shows two buttons: Save and Exit button & Next button
 - (a) If the user clicks on the Save and Exit button, the system moves to a new interface that asks the users to answer this question 'Save or cancel your submission?' and provides three buttons:
 - Oops, continue submission moves back to the submission & work flow to continue.
 - Save it, I'll work on it later moves the user to a new interface with statement written 'Unfinished submissions' and a box that contains the title, collection, and submitter.
 - Remove the submission moves the user to a new interface with the message 'Your submission has been cancelled, and the incomplete item removed from the system'.
 - (b) If user chooses 'Next', the system moves to a new interface 'Describe Item' that asks the user to enter the title of the theses and abstract, names of the readers, graduate coordinator, the external examiner, and the supervisor or co-supervisors.

The system allows the user to choose between the following: If the users decide to continue and clicks 'Next' the system move to a new interface while the system shows the progress The system asks the user to upload

the files and assign a type of the document. Then, the system allows the user to add more than one file. By clicking on 'Next', the systems moves to a new window that allows the user to review the entered information and confirm it. Then, the user will wait for the approval from the graduate studies. By getting the approval, the process will reach the last step in it informs the user that the submission is completed.

Potential Problems The submission link would not appear unless the user is logged in the system.

Scenario Submit a thesis to the Faculty of Graduate Studies Online Theses.

Notes

If the user has to submit a paper rather than a thesis and does not choose a collection then clicks NEXT, the system does not leave the page and no error message appears.

B.6 Tasks Relating to Browsing Restricted Content

B.6.1 Task #6(a): <Browse Restricted Content>

Goal Examine if the user is allowed to browse the restricted content or not and examine the system response.

Type Critical Task

Assumptions Users know that the content under this heading is considered as restricted content because it is written in the link of the

Steps (use case)

1. To browse a restricted content, the user must click on 'browse communities & collections'
2. Scroll down to the down end of the screen to find a heading 'School of Information Management Digital Image Library (Restricted Access)'
3. User has to click on it
4. The systems shows a search interface that offers a text box to type in a keyword and a list of browse options that includes: By issue date, author, title, subject, and by submit date.
5. The user types in a keyword 'management'.
6. The system responses with a message written in search results area 'Search produced no results.'

Potential Problems The system does not provide the user with an error message from the point of clicking on the link to browse the content.

Scenario Browse restricted content and search for the keyword 'management'

Notes

The user can follow the same steps to accomplish the tasks wither before logging into the system and after. There is no difference in the system's response.

B.6.2 Task #6(b):

<Browse Restricted Content within the 'Board of Governors Minutes'>

Goal Determine if the user is allowed to browse the restricted content or not and assess what the system response is.

Type Critical Task

Assumptions Users will not be notified about the restricted content until they try to gain access to it.

Steps (use case)

1. The user clicks on Browse communities & collections from the right menu in the home interface.
2. The system displays a list of all communities and sub communities.
3. The user has to scroll down to find 'Board of Governors Minutes' link.
4. The user has to clink on the link.
5. The system displays a list of the Governors Minutes classified by the year.
6. The user has to scroll down to choose 1984.
7. The system shows an interface with message that says it is a restricted content and the user has to login the system to be allowed access to the document.

Potential Problems Users will not know that the document is classified as restricted until they try to gain access to it.

Scenario Browse the Board of Governors Minutes that was issued in 1984.

Notes Users will be asked to register or login to be allowed access to the document.

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