VITAL 3 Usability Analysis – Expert review

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Executive Summary

This report describes the findings of an expert review of the VITAL 3 software. The review covered only the end user areas of the site, and focused specifically on usability concerns, though at this stage the software is still in testing and there are some technical problems to be addressed.

This report represents the expert opinion of its author and should in no way be interpreted as an exhaustive list of the usability problems in VITAL 3. Instead it should be used to advance the usability of VITAL 3 until such time as more comprehensive usability testing is undertaken.

This usability analysis was performed using standard usability principles, however the report is structured not around these principles, but around the features of VITAL 3.

General concerns

In its vanilla state VITAL 3 presents three problems across the board: speed, terminology and style (as determined by cascading style sheets). The terminology and style can almost certainly be updated during customisation to provide a better user experience, but the speed is a technical issue and must be addressed by VTLS.

Menu structures

The way the menu structures are distributed in VITAL 3 dramatically reduces the screen space available for viewing documents, and also places the main menu in an area that is less visible to users (according to an eye-tracking study) than a top menu would be.

Advanced search

The advanced search is an improvement over VITAL 2.1, being clearer and more concise. However, some of the new clarity has come at the cost of user control in areas that may be fairly important (such as searching only for documents that contain full text). Despite improvements in clarity, however, there are still some very unclear areas, and the advanced search is in many ways inconsistent with advanced search interfaces in similar systems.

Search facets

The search facets in VITAL 3 are a good idea, but their location is inconsistent with facets in other information systems (largely because of the location of the main menu in VITAL). The mapping between where users select and unselect facets is unclear, and could lead to confusion.

Browsing structures

The browsing structures in VITAL 3 are extensive and readily accessible, which is good from an information seeking behaviour perspective. However, the browsing structure provided to users is unclear and has use inefficiencies in that users cannot tell by looking how many groups of documents there are in a browsing class. This could be rectified by numbering the pages in a browse class in a similar way to the search results.

Shopping cart

The shopping cart does not work as a metaphor in a system that provides free access to information. Allowing users to gather together works of interest is an excellent idea, but the metaphor fails, and could be replaced with the idea of a folder or binder. The icons used and the mapping between the shopping cart and the quick collection are not clear. Also, there are some efficiency and privacy issues with the ‘save/email’ dialogue.

Search results/all documents view

This interface provides a significant amount of power and flexibility to the end user, but it is not clear enough that it is interactive. Also, search results should always be displayed relevance ranked, and this interface does not offer that functionality.

Icon view

The icon view is a good idea for image collections, but is significantly less useful for text-based collections. The determination about which view of a collection users get should be in the hands of
the repository manager; it is an option users are unlikely to use except by mistake. Within the icon view more metadata should be provided at the top level, and users should be able to sort by other metadata than title.

**Breadcrumb navigation aid**
Users are increasingly coming to expect breadcrumbs on websites, but they must be done well to be useful. The breadcrumbs in VITAL 3 are not adequately hierarchical to be truly useful, and may lead to users becoming disoriented.

**Document view**
The document view may work well for image-based documents, but is inefficient for text-based documents. The two page format is inefficient, and the significant scrolling required to see the link to download the document (in both cases) could prove frustrating for users who want to download the document.

**Communities and collections**
Having repository-manager-defined collections and sub-collections is an excellent idea, but the execution in VITAL 3 is somewhat problematic. Users are not given enough context when they are searching and browsing collections, and this may cause them to become disoriented and frustrated, or they may fail to find relevant materials.
**Table of contents**

1. Background ................................................................................................................................. 6
2. Methodology ................................................................................................................................. 6
3. General concerns ........................................................................................................................... 7
   3.1 Speed ..................................................................................................................................... 7
   3.2 Link marking ............................................................................................................................ 7
   3.3 Terminology ........................................................................................................................... 8
4. Menu structures ............................................................................................................................. 8
   4.1 Positive aspects of VITAL 3’s menu structures ........................................................................ 8
   4.2 Location ................................................................................................................................ 8
   4.3 Consistency .............................................................................................................................. 10
   4.4 Stylesheet problems ................................................................................................................. 11
   4.5 Key recommendations to improve the menu structure ......................................................... 11
5. Advanced search ............................................................................................................................ 12
   5.1 Positive aspects of the advanced search interface ................................................................. 13
   5.2 Changes from VITAL 2.1 and user control ............................................................................. 13
   5.3 Clarity .................................................................................................................................... 13
   5.4 Consistency .............................................................................................................................. 14
   5.5 Key recommendations to improve advanced search ............................................................. 15
6. Search facets .................................................................................................................................. 15
   6.1 Positive aspects of faceted searching ..................................................................................... 15
   6.2 Consistency .............................................................................................................................. 16
   6.3 Key recommendations on faceted search .............................................................................. 17
7. Search results/all documents display .......................................................................................... 17
   7.1 Positive aspects of this display ............................................................................................. 18
   7.2 Consistency .............................................................................................................................. 18
   7.3 Clarity .................................................................................................................................... 18
   7.4 Key recommendations for the search results/all documents interface .................................. 19
8. Icon view ........................................................................................................................................ 19
   8.1 Positive aspects of the icon view ........................................................................................... 19
   8.2 Inflexibility ............................................................................................................................. 19
   8.3 Key recommendations for the icon view ............................................................................... 20
9 Document View ............................................................................................................................ 21
   9.1 Positive aspects of the document view .................................................................................. 22
   9.2 Efficiency of use ..................................................................................................................... 23
   9.3 Information presentation ......................................................................................................... 23
   9.4 Affordances ............................................................................................................................ 23
9.5 Key recommendations for the document view ................................................................. 24
10. Browsing ............................................................................................................................ 24
  10.1 Positive aspects of the browsing interface ................................................................. 24
  10.2 Navigability problems with the browsing interface ..................................................... 25
  10.3 Clarity problems with the browsing interface ............................................................. 25
  10.4 Key recommendations ................................................................................................. 26
11. Shopping Cart/Quick collection ....................................................................................... 27
  11.1 Positive aspects of the shopping cart ............................................................................ 27
  11.2 Metaphor and the shopping cart .................................................................................. 27
  11.3 Visual mapping ............................................................................................................ 28
  11.4 Consistency ................................................................................................................. 28
  11.5 Simplicity ..................................................................................................................... 28
  11.6 CSS problems ............................................................................................................ 29
  11.7 Meeting user needs ..................................................................................................... 29
  11.8 Key recommendations for the shopping cart feature .................................................. 29
12 The ‘breadcrumb’ navigation aid ....................................................................................... 30
  12.1 Positive aspects of the breadcrumbs ............................................................................ 30
  12.2 Clarity problems with the breadcrumbs ....................................................................... 30
  12.3 Key recommendations for breadcrumbs ..................................................................... 31
13 Communities and Collections ......................................................................................... 31
  13.1 Positive aspects of communities and collections ......................................................... 31
  13.2 The name ..................................................................................................................... 32
  13.3 Sorting .......................................................................................................................... 32
  13.4 Context ....................................................................................................................... 32
  13.5 Key recommendations for communities and collections ............................................ 32
14 Conclusions ....................................................................................................................... 32
15 Acknowledgements .......................................................................................................... 33
16 References ........................................................................................................................ 33
1. Background

In 2007, Swinburne University of Technology received funding to assess and improve the usability of software associated with the ARROW Project, notably the VITAL software published by VTLS, which is used to host ARROW repositories. VITAL 3 was released in early June, and this report is about the usability of that software.

Usability is important for all human-facing software, but it is especially important for software that is designed to provide easy access to information (one of the stated goals of institutional repositories1). There are three groups of users of institutional repositories: authors, repository managers/depositors, and information seekers. These groups, while they may overlap, have distinct characteristics and usability needs:

- **Authors**
  Authors may appear in either of the other groups of users, but their primary role as authors is to provide content for institutional repositories. Their main concerns are that papers in an institutional repository are well presented, and that the presence of their papers does not harm them in any way (for example by looking unprofessional, or falling afoul of publishers’ agreements).

- **Repository managers/depositors**
  Repository managers oversee the content of an institutional repository: they make policy about what is to be in their repositories, they facilitate the deposit process, and they may influence the ‘look and feel’ of their repositories as well. Repository managers are often librarians, but this group may include technical people as well. Depositors may also be repository managers, or at institutions where self-deposit is used, this group may include authors and administrators. The primary difference between depositors and repository managers is the scope of their respective roles: depositors only deposit material.

- **Information seekers**
  Information seekers are the end users of institutional repositories—the people who are looking for information. This group may include authors, librarians, students, and the general public; at present it is impossible to tell because there have been no usage studies of institutional repositories.

While the needs of authors, repository managers, and depositors are all important, this report focuses specifically on usability for end users.

2. Methodology

The study presented in this report is an expert review (also known as a heuristic analysis). This approach relies on at least one usability specialist (often more than one, though they work independently) examining the software, and comparing it with usability standards2.

Most usability standards centre on making software more predictable; users should be able to easily understand how to interact with software, and also predict what will happen as a result of their interactions. Consistency is a contributor to the predictability of an interface; particularly consistency with software users have used for similar tasks in the past. This is not to say a usability blunder should be perpetuated because ‘everyone is doing it’, just that when an interface is very different from other interfaces used for similar tasks, the differences should be improvements in usability terms. Because we do not know who the primary users of institutional repositories are, VITAL 3 has been compared with a number of interfaces used to find items of interest, including journal databases, online bookstores, online auction sites and search engines.

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2 For more detailed information about these standards, see Jakob Nielsen’s article about heuristics (Nielsen), or for more detail see Bruce Tognazzini’s web page (Tognazzini) on usability principles.
There are four reasons why this type of evaluation was chosen at this stage of VITAL 3’s development:

1. It is simple and relatively fast to perform, and can be performed by a single expert (though a greater number of experts would produce better results)
2. There are still technical problems with VITAL 3 that would pose significant barriers to user-based testing
3. Swinburne’s installation of VITAL 3 is not yet customised, so there is scope to improve the software with customisation recommendations
4. At present, there are no usage studies of any institutional repository, meaning we do not know which tasks are most likely to be important to users. This makes it difficult to design useful user-based testing.

This review focuses on VITAL 3’s usability; it is not a comprehensive technical review. While some technical issues have been raised, they are raised solely because of their impact on information seekers.

This study examined Swinburne’s unmodified installation of VITAL 3, the ARROW Development Group’s installation, and the Osteomed.DR collection hosted by VTLS. Most investigation was done in Mozilla Firefox, though all areas in the site were inspected in Internet Explorer, too.

This report is divided up into sections based on separate parts of the interface, as many usability principles may come into play with each feature.

3. General concerns

There are a few problems with VITAL 3 that do not apply only to a single feature, or that are not specific to any feature but affect the usability of the system as a whole.

3.1 Speed

While this is mostly a technical concern, it does affect usability as well. Any delay of longer than 1 second causes the user to lose their train of thought; longer than 10 seconds causes users to lose focus on the task altogether. In tests of 3 VITAL 3 repositories, two in Australia and one in the US with document populations ranging from 5,443 to 32,330, not one repository brought back the results of a search for ‘the’ in under ten seconds, and the time to bring back the first page of a title browse was about four seconds for the two local (and smaller) repositories. Swinburne University of Technology last year produced approximately 1400 research outputs that are likely to be entered into its repository, and it is a relatively small university; larger universities may well produce many times this number of outputs. This slow speed with such small repository sizes may mean that for some universities, VITAL 3’s speed will drop below an acceptable wait time in the first few months. For VITAL 3 to be usable for large collections, speed performance must be improved.

3.2 Link marking

It is very important on the web to clearly mark links, so that users know what is ‘clickable’. Not only should clickable text be clearly marked, users should be able to see which links they have visited, and which they have not. VITAL 3, in its vanilla state, has many areas where linked and unlinked text are indistinguishable from one another (for example the breadcrumb navigation, and the clickable metadata in the document view), and also some areas where links aren’t obvious (for example the title text). Not only are these links hard to distinguish from non-linked text, the distinction between visited and unvisited links is minimal (black and dark grey), meaning users may visit a page several times unnecessarily. Links are customarily marked by colour and underline,
though with the advent of CSS colour and font-weight or colour alone is becoming more popular. If colour alone is used it is important to ensure that the colours used are likely to be distinguishable for users who are colour-blind, so for example using red links and green text when colour is the only distinguishing feature of links would be ill advised (red-green colour-blindness affects 7-10% of males). Links must be clearly marked, preferably using colour and either underline or font-weight (to make it easier to scan for links) to make VITAL 3 usable.

3.3 Terminology
VITAL 3 uses terminology that is not going to be familiar to the user in a number of places, and in the case of ‘Author’ and ‘Creator’ is not consistent internally. One of the main ways in which users are presented with unfamiliar terminology is the use of Dublin Core attribute names such as ‘Creator’, ‘Relation’, ‘Contributor’, ‘Identifier’ and ‘Source’. The best replacements for attribute names will vary depending on the users of a repository; for example academic users might prefer the term ‘Description’ to be replaced with ‘Abstract’, but laypeople are likely to prefer the original term. Aside from the Dublin Core attributes, there are a number of areas where VITAL 3 is using unfamiliar and even idiosyncratic terminology. For example the ‘Communities and Collections’ are likely to be misunderstood because of the word ‘communities’, and instead of asking users if they would like to ‘download’ a document or ‘open [it] in [their] browser’ asking them if they would like to ‘view’ or ‘save’ the document might be more suitable. There is also a significant number of misunderstood library terms used in VITAL 3, for example ‘full text’ and ‘resources’. The terminology used in VITAL 3 must be better adapted to a non-library professional audience to make it usable, though as mentioned above the best replacements may vary from repository to repository, and individual repositories may benefit from user testing.

4. Menu structures
The menu structures in VITAL 3 cover all the necessary navigation in an institutional repository, and even offer some useful additional features (see Section 4.1). However, these menu structures do have a number of usability problems, and changes to the way the menus are laid out could result in vastly improved usability. The problems identified and suggested improvements are outlined below.

4.1 Positive aspects of VITAL 3’s menu structures
The introduction of the highlights section in VITAL 3 is a positive step. This section is good for information seekers, in that it allows them to serendipitously discover interesting material. This type of feature has also been shown to increase author participation in IRs, and thus increase the amount of content available to end users.

Having a search box available on every page is extremely important to users, particularly in an information seeking interface, and thus its inclusion in the navigation structure is to be commended. Having a home link on every page to allow users to re-orient themselves if necessary is also good usability practice.

4.2 Location
At present, the menu structures are divided into five separate sections, spread over the page (see Figure 1). While some of these divisions are logical, and consistent with most other websites (for example the division between the technical links, such as privacy and copyright, from the functional links, for example search and browse), other divisions are not so common, and may mean users cannot find the functionality they are looking for. A notable example of this problem is the

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5 See the Wikipedia article on colour-blindness (“Color blindness”).
6 For a discussion of library terms users do and do not understand, and examples of how to do user testing of terminology, see Kupersmith’s excellent summary at (Kupersmith).
7 Paula Callan gave examples of how statistics had been useful to and appreciated by authors in (Callan, 2004).
separation of the ‘Home’ link from other navigational links. Spreading links out in this way forces users to look all over a page to find something (which may distract them from the content of their search results or browsing page), particularly as many sections are not found in conventional places, notably the search box and the home link. The placement of the sign-in link away from everything else is appropriate, as at present it is used by a minority of users (repository managers only), though ideally this link would be placed in a low visibility area of the page (such as the bottom right) and marked as administrator-only or removed altogether, and a separate URL provided for administrative activities. It is important to clarify the purpose of this link so that users will not think they are required to log-in to access the content of the repository (as they are with other services, for example you have to log in to buy on eBay or Amazon, and you have to log in to download from EBSCO). If the purpose of this link changes (for example to allow users to download copyright-protected materials) then its prominence should be reassessed at that time.

Not only is the spread of the menu items over the interface difficult to use, the location of the main menu (down the side of the interface) means greatly reduced space to show browsing structures or search results, meaning users will have to do more scrolling or navigating through pages (this problem is exacerbated by the bands of white on either side of the VITAL interface). On a 1280x1024 resolution, the VITAL menu takes up 19.5% of the available screen width, meaning that users will have to scroll up to 19.5% more than an interface where no width is taken up by menus. Compared to other sites with side menus, VITAL’s menu is relatively wide—of the sites surveyed, only EBSCO had a wider side menu (27.5%). Koha (a library system), Amazon, and eBay’s side menus ranged from 16.8-13.75%, and Google, Web of Science, and Swinburne’s installation of
Dynix library catalogue did not use side menus at all. While scrolling is not as dire a problem as it once was for users, many users will still miss information ‘below the fold’ (especially if there is something ‘above the fold’ that seems close enough). This potential for information to be missed means scrolling should be minimised unless it is impossible to avoid scrolling without a significant decrease in what the site can offer to a user.\(^8\)

Not only does the side menu cause users to have to scroll more, it is also in a less visible place than a top menu (for example the menu structure in VITAL 2.1). Eye tracking shows that users see top navigation more often than side navigation, and that they spend longer looking at it than they spend looking at side navigation.\(^9\)

### 4.3 Consistency

For a website to be usable, it is important that it is consistent both internally (that is that different parts of the website are recognisably from a whole, and user interaction is similar in each of those parts) and externally (that is the website follows existing conventions used by similar sites and software).

#### Internal consistency

VITAL 3’s navigational structures have a couple of problems with internal consistency. The first, mentioned above, is the separation of the ‘Home’ link in both location and appearance from the rest of the main navigation structure. The second problem is the menu structure of the main menu (see Figure 2).

The main menu is divided up into three main ‘chunks’ represented by panels in the appearance of the menu. The top chunk is also divided into sections, using the same heading style as the tops of the panels. While the divisions being made at both levels are sensible (dividing search from browse, and dividing document finding from help materials, for example) the heading size makes the divisions inconsistent, by implying the divisions within a panel are the same as the divisions between panels.

The other internal inconsistency in this menu is the ‘Advanced Search’ link; this link is the only link on the page that is part of a title, making it less likely to be seen, and less obviously a link. Ideally, if the same menu structure were to be retained, the advanced search link would be moved to its own line below the search box.

#### External consistency

The navigation structure of VITAL 3, while it shares many features with other sites (which is good, because it makes things easier for users to find) has a few problems with external consistency.

The most important external consistency concern with VITAL 3 is the location of the search box. Search is extremely important to the usability of a site, and must be easily found on an interface.\(^10\) There are a number of search box placement conventions, including top left, but not within a

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\(^8\) For more about scrolling see Jakob Nielsen’s Alertbox column on it: (Nielsen, 2005b), or Bruce Tognazzini’s list of principles at (Tognazzini).

\(^9\) See the study results from Steve Outing and Laura Ruel at the Poynter institute: (Outing & Ruel)

\(^10\) Jakob Nielsen writes on search (Nielsen, 2001). While some of this holds true for VITAL 3, the intended audience is those with eCommerce sites. VITAL 3 is to be used to find information, not products, and may be used by librarians. Until we know for certain that advanced search is not used, I believe there should still be a link to it from the home page.
standard menu (eBay, Koha, EBSCO), top centre (Google, Amazon, Dynix), and top right (Firefox, Microsoft Word, eBay search results—eBay uses two search boxes). The interfaces that are search focused all provide a much longer search box than is seen on the VITAL interface and in each case the search box is found as part of a menu. Contrary to my previous recommendations, I do not think it matters what alignment the search box has, provided it is large enough to enter a number of words, is found at the top of the interface and is always present (this is one excellent feature of VITAL 3’s navigation structure: the search box is present on every page).

The second external consistency problem is the location of the internationalisation menu. In interfaces where the user is likely to need to change the language of the interface, the selection is invariably made at the top right of the interface (Helsinki City Library, Library of Boroondara), or in a preferences section (Google, New Zealand Digital Library, Firefox, MS Word). The VITAL 3 internationalisation menu is located where a choice of sites for different countries is in eBay and Amazon. While VTLS is to be complimented on providing internationalisation, this internationalisation could be more usable if it were located in a more conventional place. It is also worth noting that for many institutions using VITAL 3, allowing users the option of internationalisation may result in poorer usability. If the institutional repository is the only area of a branded corporate website users can view in their own language, moving between the repository and the rest of the website will require the reader to change languages, which can decrease reading speed and increase the effort they need to make to understand what they are reading.\footnote{This article deals with the cost of multitasking, and briefly mentions the difficulties faced when reading in an unexpected language: (“Multitasking - Switching Costs”).}

The third external consistency issue in the VITAL 3 website is the placement of the highlights links. It is reasonable to compare these links to promotional material on Google, Amazon, or eBay, as they are material that is being ‘advertised’ as IR content. In all three cases mentioned above the advertising links are to the right hand side; Amazon and eBay have them only on their main pages, Google provides them with search results as “related links”. As the VITAL 3 highlights are not related to search results, consistency dictates that the highlights links be placed on the homepage, to the right, and not on any other pages (this is also good usability: it gives the user the opportunity to discover interesting works without disrupting their searching and browsing tasks.

### 4.4 Stylesheet problems

Fixed width page sections cause usability problems in VITAL 3, because they do not expand to fit the necessary text onto them, nor does text wrap appropriately (meaning that the ends of some menu items are ‘lost under the edge of the menu’). For an example of this, see the entry for ‘Communities and Collections’ in Figure 2. More than just looking a little strange, this means that users cannot see all the information in a menu, especially at larger font sizes.

### 4.5 Key recommendations to improve the menu structure

While there are a number of suggestions for improvement in this section, many of these are relatively minor, and still others are a selection of options to choose from. The recommendations below are the ones that I believe will have the most positive impact on the navigational structure of VITAL 3:

- **Move the main menu to the top**
  By moving the main menu to the top of the interface, to align with the home link the menus are consolidated, take up less screen real estate and are in a place where users are more likely to look. This solution could also ameliorate the fixed-with problem.

- **Move the search box to the centre of the interface, and make it longer**
  While many websites have their search boxes in the top right of the interface, those that are specifically used to find products of some description (as opposed to pages that offer only a
single service, or are meant for reading only) put long search boxes in the top centre of the
interface (under their menus). Not only are the search boxes in pride of place on these
interfaces, they are longer, to encourage the user to enter more words and (potentially) find
more accurate results. Since the purpose of an IR is finding research outputs, by convention a
long centre search box should be displayed.

- **Put highlights on the main page, to the right**
  Highlights on other interfaces are displayed on the right hand side of the page (see Google,
eBay, Amazon), and VITAL 3 should follow this convention. Because the highlights are not
linked to search results, they should be placed on the main page only to avoid confusing or
distracting users from search results or browsing structures. This feature is an excellent way to
allow users to discover interesting papers serendipitously, and should be retained.

- **Alter the sign-in link**
  As sign-in is only available to administrative users, this link should be in a less-viewed space
on the page (perhaps the bottom right, or perhaps as part of the functional links) and clearly
marked as “administrator only”.

- **Remove the internationalisation menu**
  For maximum usability, the IR interface should be presented in the same language(s) as the
institutional website (which will likely also reflect the languages in which materials in the
repository are presented). The available languages should be selected by repository
administrators, and if a choice is available to end users, this should be presented in the top
right-hand corner, as is customary.

### 5. Advanced search

The advanced search page has improved significantly in the new release of VITAL, and some of
these improvements are highlighted below. However, there are still a few problems with clarity,
user control, and consistency, which are discussed in this section.

**Advanced Search**

![Advanced Search interface](image)

**Figure 3:** Advanced search interface
5.1 Positive aspects of the advanced search interface

From a usability perspective, the advanced search interface in VITAL 3 is a large improvement over that offered in VITAL 2.1. The alignment of interface elements is now tidy in both Internet Explorer and Firefox (see Figure 3), and different types of advanced search are now clearly separated from one another.

The default search settings are likely to produce highly relevant results (due to the use of ‘AND’ as the default operator), but are not so restrictive that they are likely to produce no results. Given that users often do not change default settings, the defaults in VITAL 3 are well chosen.

5.2 Changes from VITAL 2.1 and user control

The advanced search in VITAL 3 offers significantly fewer options than that in VITAL 2.1, particularly for the display of search results, and in the restrictions people can place on their search results.

Arguably, the removal of display options could improve usability, provided the default display ranks search results by relevance, and show the same number of results per page as the simple search. Users are unlikely to change defaults, particularly those that pertain to the display of their search results, so offering them the option may just be increasing their cognitive load without offering any real benefit.

Removing many of the restrictions on search results, however, reduces user control in an undesirable way, especially removing the ability to restrict search results to peer-reviewed work. Peer-review is especially important to academic users of any information system, and removing the ability to restrict search results to peer-reviewed materials is a step backward. These same users place different emphases on different types of work (for example in computer science conferences are highly regarded, in other disciplines this is not so much the case), so the ability to restrict search results to specific resource types is also a feature that should have been continued. (It is possible to select a given resource type from the search facets after a search, but this involves both scrolling to the bottom of the page and an extra step on the part of the user, and is therefore not an acceptable alternative).

5.3 Clarity

The clarity of the advanced search interface is greatly improved from that of VITAL 2.1, however there are still some areas that are unclear, and could be improved upon.

The ‘Limit results’ section has two areas that could be clarified: the full text section, and the ‘Return results between’ section. The ‘Items with full text’ checkbox may be misinterpreted by some as an instruction to include items with full text in the search results, rather than a restriction of results to only those with full text. This could be clarified by marking this field ‘Only items with full text’. The ‘Return results between’ section is problematic because it is not clear what kind of metadata should go in the text boxes; possible interpretations include date (the correct one) alphabetical by title, and alphabetical by author. This section is also unclear because with the word ‘between’ wrapped onto the following line, it is not immediately obvious whether it belongs with ‘return results’ or ‘collections’. This could be clarified by replacing ‘Return results between _____ to _____’ with ‘Year published is between _____ and _____ (YYYY)’. The second alternative not only tells the user exactly what kind of metadata is expected, it also tells them the format the system needs. Another solution would be to replace the text boxes with drop-down menus (this would reduce error rates), but drop-downs where it is faster to type have been shown to annoy users.\(^\text{12}\)

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\(^{12}\) See Jakob Nielsen’s comments on drop-down menus (Nielsen, 2000b).
Another set of clarity problems in the advanced search are the collection search and the expert query. It is not obvious what either of these queries does, and there is no help available for them. The collections search could be clarified by renaming it ‘Search by collection title’ (if that is its sole functionality). The ‘Expert Query’ could be renamed ‘Boolean search’ (it should also include instruction on which Boolean operators it will accept—does it use AND, &, or the prefix + for example).

The final clarity problem is a difficult one: Boolean search. This is particularly hard to get right from a usability perspective, and the example shown here is actually pretty good—it shows users the expected syntax for Boolean search, and makes it relatively easy to generate search strings. The problem, however, is with the Boolean operators themselves; they simply don’t match user expectations, for example Boolean ‘OR’ is inclusive (red or green or both), while in English ‘or’ is generally exclusive (do you want tea or coffee?). Another example of a problematic Boolean expression would be a search for ‘navigation NOT GPS OR sextant’, in which the returned results (if the Boolean expression is evaluated in order of precedence) would include documents that contain the word ‘sextant’, and would not return some documents that contain ‘navigation’.

Research shows that even computer scientists (a group that should be conversant with Boolean logic) often use Boolean arithmetic incorrectly. One way around this is the approach taken by other information searching interfaces (e.g. Google’s advanced search, and the advanced search in the ACM digital library) is to use the ‘all of the words’, ‘any of the words’, ‘none of the words’, ‘exact phrase’ paradigm (see Figures 4(a) and 4(b)). While this is less powerful than traditional Boolean search, it provides users with a clearer match to their understanding of the English language, and powerful Boolean search is still available through the ‘expert query’ for those who want it.

5.4 Consistency
There are two consistency problems with the VITAL 3 advanced search interface: the location of the advanced search button, and the existence of the reset button.

The left-hand position of the advanced search button is both internally and externally inconsistent. Within VITAL 3, all other search buttons are to the right of the text boxes they are associated with.

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13 See (Jones, Cunningham, & McNab, 1998) for more information on this.
14 Ibid.
(in an English language interface, this makes sense as we work left to right). The right-hand location of the advanced search button is also common to Google, eBay, the ACM Digital Library, and Dynix, some at the top, most at the bottom. Amazon’s advanced search button is not on the far right; however the button’s leftmost edge is under the leftmost edge of the advanced search input boxes. Given that English speakers work left to right, top to bottom, the most logical place for users to look (and the most conventional place for a search button) is at the bottom right of the interface.

The reset button is inconsistent with the advanced search interfaces mentioned above—none of them has them. Usability studies have shown that reset buttons on web forms often do more harm than good, as users press them more often accidentally (thereby wiping all the information they have laboriously entered into a form) than intentionally; an error from which it is difficult to recover. The reset button should be removed from the interface.

5.5 Key recommendations to improve advanced search

- **Move the search button**
  Move the search button on the main advanced search to the bottom right to improve consistency and workflow.
- **Remove the reset button**
  Remove the reset button so the user cannot accidentally wipe their search, and to improve consistency with other advanced search interfaces.
- **Clarify labels**
  Label the date filtering clearly so users know immediately that they can enter year numbers. Rename ‘Collection search’ as ‘Search collection names’, and ‘Expert query’ as ‘Boolean search’. Add information about syntax to the Boolean search.
- **Change the search style**
  Boolean search is hard, and even a computer science search uses the ‘All words’/‘Any words’/‘Without the words’/‘Exact phrase’ style search. Changing to this approach would mean inexperienced searchers can run more effective advanced searches, while search experts can use the Boolean query interface.
- **Increase ability to filter results**
  It is likely to be important to academic users to be able to search for peer reviewed results, or results from specific types of publication, so these filters should be available in the advanced search.

6. Search facets

The provision of search facets is an excellent way to allow users to filter their own results, and can make searching much more effective, however the usability of faceted search in VITAL 3 could be improved.

6.1 Positive aspects of faceted searching

The faceted searching in VITAL suits users in a number of ways. The columned display is consistent with user and designer preferences, as is retaining the information on the screen (rather than using pop-up menus). These display options are preferred by users because they get a clear overview of the available facets, making it easier to hone in on relevant search results (rather than having to guess which heading to mouse over, for example).

Allowing users to use more than one facet hierarchy at a time is preferred by users (again, because they gain greater control over their search results), so the multi-faceted approach taken in VITAL 3 is good usability.

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15 See Jakob Nielsen on reset and cancel buttons on web forms (Nielsen, 2000a).
16 See, for example, User Experience and Design on faceted search (“Faceted Search Results,” 2006).
6.2 Consistency

The main problems with VITAL 3’s faceted searching are consistency issues, both internally and externally.

External consistency

The location of the facets in VITAL 3 is different to all other faceted search interfaces studied: Amazon, eBay, Koha and EBSCO all provide facets, and all include them in left-hand menus displayed with search results (other interfaces include top panels, along with their left hand menu, or use top panels alone, but none use a bottom selection as in Figure 5).

The location of VITAL 3’s facets would be acceptable if it provided significant usability benefits, but this is not the case. The location of VITAL 3’s facets means they are less likely to be seen by users, and less likely to be understood as having any relationship to the search results. The separation of the facets users can choose from and the display of chosen facets (and the place where facets can be deselected) means users may not make the mental link between selected facets, and those they can choose from below. If users fail to make this link the interface will be hard for them to control, and behave in unexpected ways, reducing usability dramatically.

It is also not consistent with other interfaces (or with recommended best practice) that users cannot see the hierarchy of their selected facets; once a facet is selected it becomes an ‘orphan’ facet in the search menu. In combination with the separation of selected and unselected facets, this
makes it very hard for users to visualise what restrictions they have placed on their search results, and what restrictions remain available to them.

**Internal consistency**

The icon used to remove a facet is different from the icon used to remove an item from the ‘cart’ (see Section 8 for more details about the shopping cart), and there is no ‘add’ icon, merely links. This means users have to learn a number of symbols despite those symbols having similar purposes.

### 6.3 Key recommendations on faceted search

- **Move the facets so they are a side menu**
  Make the facets a side menu, so they are consistent with other interfaces, and they are confined to one place (see Figure 6 for some examples).

- **Provide a hierarchical display that allows users to visualise which facets are in play**
  Let people see what facets they have selected, and which are still available to them (and give them the opportunity to backtrack) (see Figure 6).

- **Move to consistent symbols for add and remove**
  Use the same symbols for add and remove throughout the interface; i.e. do not have add and remove symbols in the search facets that are different from the add and remove symbols in the quick collection interface.

### 7. Search results/all documents display

This is a flexible, interactive display. Documents in the display are initially sorted by date for both ‘See All’ and search results, but users can choose to browse documents by different metadata interactively by clicking on the column headers in this display.
7.1 Positive aspects of this display

This display is very flexible, allowing users to select the metadata by which they wish to browse. Not only is flexibility a good thing generally, it has been shown to be especially helpful to browsers in digital library systems\(^\text{19}\). Not only is this system flexible, it is easy to use, and requires only a single click to change things.

This system also allows users the flexibility to move easily through the pages of documents, with ‘first’, ‘previous’, ‘next’, ‘last’ and numbered page links for navigating between pages of results. This flexibility is balanced with context provided by highlighting the number of the currently viewed page.

7.2 Consistency

Search results are presented in the first instance sorted by date. While it is reasonable to assume that users might want the most recently published articles first (and this is a good solution for the ‘All Documents’ page), this is inconsistent with every other information system examined in this analysis; all of them rank their search results by relevance. Given that users are so accustomed to seeing relevance-ranked search results, they often do not look beyond the first page of results for useful documents\(^\text{20}\).

It is of paramount importance that VITAL 3 provide relevance-ranked search, and provide an option for users to return to it if they are unsatisfied with metadata browsing.

There is a minor external consistency problem with the ‘first’, ‘next’, ‘previous’, and ‘last’ links—other information search systems include directional cues with these systems, for example ‘>>>’ for last, and ‘>’ for next. This gives users easily recognisable symbols, and would possibly allow users to navigate faster. Interestingly, none of the major search tools tested (including Amazon, EBSCO, Dynix library catalogue, Google and eBay) include ‘first’ and ‘last’ links, however until testing shows conclusively that these links are not used, their low level of distraction and large increase in flexibility dictates they should remain in place.

7.3 Clarity

The interface for displaying list of documents (either search results, or ‘all documents’) is very powerful, but the cues to the user that this power is available are very subtle. The light grey background to indicate the sort metadata is not particularly imposing (see Figure 7), and users must mouse over column headings to discover they are interactive. It needs to be more obvious to users what the sort metadata is at any given time, and how they can change that.

\(^{19}\) See (McKay, Shukla, Hunt, & Cunningham, 2004) for a discussion about how flexibility helps browsers.

\(^{20}\) See Jakob Nielsen on search: (Nielsen, 2001) and (Nielsen, 2005a)
Given that the document list interface is not unlike that of email (columns of metadata that you click to sort) and email is near-ubiquitous, adding email-like cues to the interface would make this feature readily visually identifiable and recognisable—specifically the invertable triangle that is so common to email systems (see Figure 8). Vertical divisions between metadata types may also help.

7.4 Key recommendations for the search results/all documents interface

- **Sort search results by relevance, and include a mechanism to return to this sort order**
  Users expect search results to be ranked in relevance order. While allowing searchers to change the order of their results is very powerful, the initial order must be what they expect or they may miss relevant documents, and they should be able to go back to this order at will.

- **Add directional cues to ‘First’, ‘Previous’, ‘Next’ and ‘Last’**
  Even if it is text-based cues such as ‘<<’ this will make the interface more navigable by providing familiar visual cues.

- **Add an invertable triangle to the sort metadata**
  This mimics the familiar email sorting interface, and coupled with the grey shading provides strong but subtle cues which metadata is being used as sort metadata. Not only will the triangle provide cues as to which metadata is currently the sort metadata, it will highlight the interactivity of this display.

- **Add vertical divisions between table headings**
  This will mean column headings further mimic email, and in so doing will further imply that users can click on them to interact with them.

8. Icon view

The icon view is an alternative visualisation of search results that features the thumbnail images associated with documents as its primary metadata (see Figure 9 overleaf).

8.1 Positive aspects of the icon view

The icon view is an excellent way to display highly visual collections, and by putting many documents on a page it ensures that users will have to look through many fewer pages to find interesting images.

8.2 Inflexibility

While the icon view is good for image-based collections, it is not at all helpful for text based collections—it shows too little metadata, it doesn’t have the flexibility of the list view in terms of sorting, and the icons of text documents are too small to be useful. Conversely, the list view is not useful for an image-based collection as it provides no visual information about documents. For a collection of documents that includes images and documents, the user would be forced to choose
between the icon view and the list view, with neither being particularly satisfactory. A combination interface would enhance the experience of users viewing a combined collection, and have the further benefit of removing the risk of users who are viewing a single-format collection accidentally changing their view type and being unable to change it back.

The icon view is further inflexible in that it does not allow users to sort by any metadata other than title; this restricts users who may seek works from a specific timeframe or by a specific artist. A combined interface would solve this problem as well, if it kept the functionality of the list view but added thumbnails.

8.3 Key recommendations for the icon view

- **Make it a repository manager setup option**
  Repository managers will know whether the collections they build are mostly text, mostly images or a combination, so they should be the ones to choose how their collections are displayed. If the manager selects one view or the other, the options should be invisible to the user, not greyed out. For managers who allow users to choose their own icons, it would be worthwhile testing the terms ‘list view’ and ‘icon view’, as they may be too technical to be meaningful (particularly ‘icon view’), and may be better termed, for example ‘text view’ and ‘image view’ or ‘thumbnail view’.

- **Include the ability to show icons in a list view for mixed collections**
  If a collection is made up of mixed media, and thumbnails would be useful, then it should be possible to display a small thumbnail to the left of the textual metadata in a list view. This need not take up too much room, and could be controlled by repository managers; Amazon’s search results are an example of text and visual metadata combined, but present a little too much sales information to be a completely applicable model.

- **Expand the available sort metadata**
  Allow users to sort visual collections by any available metadata, not just title. Possible metadata types users may wish to sort by include author (or artist), date published, search relevance, and file size.
9 Document View

The 15-D Measure of Health Related Quality of Life. II Feasibility, Reliability and Validity of its Valuation System

Creator: Sintonen, Harri
Contributor: Monash University Faculty of Business and Economics National Centre for Health Program Evaluation
Relation: Centre for Health Economics Working Papers
Description: The 15D is a generic, 15-dimensional, standardised, self-administered measure of health-related quality of life (HRQoL), that can be used as a profile and single index score measure. This paper introduces alternative valuation models based on the multi-attribute utility theory for generating the single index scores, and examines their feasibility, reliability and validity by using several data sets and methods. Valuations were elicited from several representative samples of Finnish adult population by using rating scales in self-administered questionnaires and postal surveys. The approach proved to be feasible and produced valuations with a high reliability. There is solid concurrent evidence of construct validity for the index scores generated by additive 2-stage or 3-stage valuation models. Tests for reflective equilibrium provided strong evidence that these scores exhibit a more plausible trade-off between length and quality of life than some other single index score measures (EQ-5D, QWB, McMaster), and are thus more valid for GAYL calculations in cost-utility analysis. The values are consistent and quite likely widely generalisable and usable at least in Western-type societies. The 15D is thus probably the most sensitive and comprehensive HRQoL measure presently available that combines the advantages of a profile and single index score measures with a high level of reliability and validity.

Collection: Department of Management. WORKING PAPERS SERIES
Collection: "DEVELOPMENT COLLECTION"
Date: 1996
Identifier: arnott6.13803
Type: Working paper
Source: Working paper
Format: application/pdf
Language: eng

Bottom of first screen in Mozilla Firefox with all toolbars at 1280 x 1024 pixel resolution

First page image— not interactive

Bottom of second screen (using page down) in Mozilla Firefox with all toolbars at 1280 x 1024 pixel resolution

Link to open document

Figure 10(a): First page of document view
The document view is in two stages, as shown in Figures 10(a) and 10(b) above. The first view is what users see when they click on any document in any list of titles.

9.1 Positive aspects of the document view

The document view provides a wide range of information to users to help them decide whether or not they would like to continue to download the document, including the abstract (where available), the type of material (conference paper, working paper, etc.) and research institute affiliations. This information is not only useful to information seekers, to a certain extent it is also in keeping with major journal databases (examples tested include EBSCO, Thomson Gale, and Elsevier). These databases provide for each paper the abstract, publication title, publication volume and issue, number of pages, a persistent identifier, a link to the full text (where available) and of course title, date and author.

The picture preview available in the document view is likely to be useful in graphical works, where the size of the thumbnail presented is likely to be sufficient to allow searchers to determine if the image they have found is what they were looking for (and print-resolution images are unlikely to be available for copyright reasons).
9.2 Efficiency of use
The document view in VITAL 3 presents a number of efficiency of use problems, including the two-stage download process, information overload, and scrolling.

From the first document information screen, users must navigate through a second screen before they can download a document; this process is very inefficient (particularly over a slow internet connection). Some of the information deemed useful by the journal databases (such as the number of pages in a document) is not available until the second page, and none of the journal databases have a second page at all—if the document is available for download it is available from the document information page (some databases even link to the full text from search results pages). This process needs to be simplified so users can download the full text of a document, if it is available, from a single document information page.

The document information page provides more information than the average journal information page, and some useful information is relegated to the second page. One example of something that is not normally provided by journal publishers is the language of the paper; another is the format of the paper (if this is provided at all, it is as part of the download link). Having all this ‘extra’ information makes it harder for the user to quickly locate and evaluate the relevant information.

A further inefficiency in the document view is that the user has to scroll quite a long way (see Figure 10(a)) to get to the link that takes them to the download page (this problem is repeated in the download page—see Figure 10(b)). A link to the full text of the document is “important information”, and should be visible from the moment the user navigates to the document view. Scrolling could be reduced by changing the main menu location to allow more screen width and removing extra information—for example the first-page images of text documents.

9.3 Information presentation
The problems with the information presentation of the document view contribute to the inefficiencies mentioned in Section 9.2, because they make the page longer and cause more scrolling, but they also cause usability problems in their own right in that information is provided in a way that users may find hard to interpret.

An example of information that may be hard to interpret is the presentation of author names; customarily author names are ordered specifically to represent the size of the contributions made by authors. Displaying them on separate lines (as in Figure 11) not only makes the page longer, but decreases the clarity of the author order. Similarly confusing are the two available identifiers for each document, and the use of the element ‘contributor’ to refer to the authors’ department (this could get particularly confusing if the authors are from different departments, as there is no way to relate an author to a department).

9.4 Affordances
Affordances are the properties of an object that let us know by looking what we can do with it, for example the shading on an on-screen button lets us know that it is interactive and we can click on it. In the document view in VITAL, the border around the image of the first page and experience with other online document systems (for example JStor) suggest the image affords clicking, and that clicking the image may be a way to download the document. This confusion is exacerbated by placement of the download link below the image, meaning that task-driven users who want to download the document see the image first (and must scroll past it to find the link). Removing the

Figure 11: display of multiple creators

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21 See Jakob Nielsen’s article on scrolling (Nielsen, 2005b)
edges of the image would reduce the suggestion that it is interactive and make the interface more usable.

9.5 Key recommendations for the document view

- **Combine the pages into one**
  Users should be able to get all useful information about a document, including a link to the full text (where available) on a single page. Not only is a single page format used in all other interfaces reviewed, it is much more efficient, particularly over a slow internet connection.

- **Make the link to full text (or the indication that full text is not available) prominent**
  One of users’ primary tasks in a system such as VITAL is to download full text. Users must be able to see the link to this text (or a clear statement that the full text is not available for download) as soon as they navigate to the page. Ideally this link (or the unavailable statement) would be sufficiently eye-catching that users would not have to scan too much for it.

- **Remove the image of the first page of text documents**
  The first page image of text documents is too small and too low resolution to be useful (and in general would not be useful anyway if a good abstract has been provided). Moreover it takes up screen space, and appears to be clickable when it is not. This image is best removed (for text documents; visual media such as images and video have different requirements).

- **Redesign the save/email citations dialogue**
  As per Sections 11.5 and 11.8 there are privacy and simplicity problems with the save/email dialogue, and these could be avoided with a redesign.

- **Rationalise and rename metadata to reduce scrolling and overload**
  While the information that is useful may vary from institution to institution (for example the language a paper is written in may be useful in Canada, where it might be English or French, but might be less useful in Australia where it will almost certainly be English), it is unlikely that all the information presented to users in Figures 10(a) and 10(b) will be useful to many users at any institution. The display of this metadata also needs to be rationalised, so that (for example) authors all appear on a single line. Decisions about the metadata to be displayed should be based on what users are likely to expect and find useful (this can be determined in part by looking at other information systems an IR’s users are also likely to use). The words used to describe each metadata element also need to be tailored to each repository’s users (see Section 3.3 for more discussion of terminology).

- **Clarify links**
  As outlined in Section 3.2, the distinction between linked and un-linked text needs to be clarified. This is especially true in the document view as the metadata links are useful browsing avenues, but they are unlikely to be seen.

10. Browsing

Browsing is an important part of the information seeking process, so it is good to see it included in VITAL 3. There are some usability problems with the way browsing structures are laid out, and a change in the menu structure to a top menu has some implications for how browsing menus ought to be displayed as well.

10.1 Positive aspects of the browsing interface

The browsing flexibility afforded by VITAL is excellent; the fact that users can choose from a number of metadata types means they can focus on the context of their information seeking (example scenarios might include ‘I want to find more papers by the same author’ or ‘I need to know about hydro dams’).

Providing browse options in a left hand menu is consistent with a number of other interfaces, including Amazon and eBay, and VITAL 2.1, so this is a usable approach.
Being able to move through the browsing hierarchy with links at either the top or the bottom of the page is good for user efficiency and freedom, so it is good to see the ‘View next set’ links in both places.

The ‘enter the first few letters’ functionality (see Figure 12) also provides an option for metadata searching, which is useful for known-item searches, but would be easier to find if it were included as a drop down option in the main search.

10.2 Navigability problems with the browsing interface

VITAL 3’s browsing interface makes it hard for users to see where they are and where they have been within browsing structures. This is problematic on two levels: this lack of contextual information can make it easy for users to get lost, and it also means they may not be able to use the browsing interface to get an overview of what is in a collection, which is one of the main purposes of browsing.

Not only is it easy for users to get lost, they can only move forward through a browsing structure using the links on the page; there is a ‘next’ link but no ‘previous’ link. This means users cannot control their browsing experience very well, and is inconsistent with all other browsing interfaces examined during this review.

10.3 Clarity problems with the browsing interface

When users select a browsing class (for example ‘All subjects beginning with ‘I’’), they are given no indication of how many subclasses there are in that class (in the example above, the number of subjects that begin with ‘I’). The classes (in this case subjects) that will fit within a page (by some
definition of the word fit, since users have to scroll to see the end of the list) are shown, but no indication is given whether this is the complete list, or how many pages there are in the list. Users must click the ‘next’ link to determine whether there are more subclasses in the present class. This lack of information about class size may mean that users miss parts of a class because they think the first page shows them all the entries, and it makes it impossible for users to get an understanding of the size of the class, or navigate to the middle of a class (for example).

10.4 Key recommendations

• **Remove the search section, and allow people to search metadata in the main search**
  This would make the search interface more powerful and flexible, improve consistency with library catalogues, Amazon, and eBay and de-clutter the browsing interface. An example of a drop-down for metadata searching in the main search is shown in Figure 13. (If the search section is to be retained, the button must be renamed ‘Search’, rather than ‘Submit Query’, to be written in the user’s language).

• **Display two columns per page, except for titles**
  For metadata where the entries are narrow, such as subject headings and author names, two lists per page could be shown to reduce the number of pages users have to browse through. This type of display is used in Amazon and eBay, and the display is two vertically sorted columns. For this type of display to be optimally usable, both columns must fit vertically into a single page (if they don’t, users have to scroll down to read the end of the first column, and back up to read the beginning of the second column, and users hate scrolling). This will not work with title metadata because it is too wide horizontally, and wrapping will mean that users see less on a page in a two column format than they would with a single column.

• **Indicate how many items are in a class, and allow users to navigate effectively between pages of these items**
  Display links to pages of items in a class, either numbered (see Figure 14(a)) or divided up by starting letter (see Figure 14(b)). Include ‘previous’ and ‘next’ links, as in Figure 14(a).

Figure 13: Metadata Search

![Figure 13: Metadata Search](image)

Figure 14(a): Browsing classes split by numbers. Note the ‘previous’ and ‘next’ links. The ‘sort by’ function is not needed in VITAL

![Figure 14(a): Browsing classes split by numbers](image)

Figure 14(b): Alphabetical browsing divisions (note not all letters are represented because this is a Māori language example)

![Figure 14(b): Alphabetical browsing divisions](image)
Indicate which classes have been visited, and which class is presently being viewed

The search results pages use red to show which page the user is on. Colour is one possible means of indicating this, and works well for most users; however, colours should be chosen carefully to be distinguishable by colour-blind users, who make up 1.3% of the total population (prevalence of red-green colour-blindness is up to 10% in males). Used carefully, however, colour distinctions between visited and current pages would be well advised for the browsing pages also (see Figure 14(b), above, for an example of this).

11. Shopping Cart/Quick collection

The shopping cart is a mechanism to allow users to collect documents of interest they find in a single session. The shopping cart/quick collections idea is a good one, and consistent with other systems where people may like to collect documents for later reading (for example, journal databases), but there are serious usability problems with the execution of this idea in VITAL 3.

11.1 Positive aspects of the shopping cart

It is useful to allow users to collect interesting-looking documents to read or follow up later; research shows that people do a lot of browsing and very little reading online. The one-click ‘add-to-cart’ system (see Figure 15) is lightweight, and thus doesn’t interrupt the user’s flow, which means they can save documents without interrupting the task at hand.

Allowing users the choice of emailing or saving citations caters for users working on either a personal computer or a public computer, which is good flexibility. Allowing users a choice of citation format, including EndNote (which is supported by Swinburne Library, and likely many other academic libraries) means they can fit the citations into their own workflows.

11.2 Metaphor and the shopping cart

One of Jakob Nielsen’s usability heuristics is that the system has to match the users understanding of the real world. Metaphor is one way to do this; the ‘desktop metaphor’ employed in Microsoft Windows is a famous example. The shopping cart metaphor is used in online shopping sites to collect items the shopper would like to buy, and it might seem consistent to use it here. The problem, however, is that a shopping cart implies the user is going to buy something, which sets unrealistic expectations in a system where the information is free.

The shopping cart is the wrong metaphor to be using in VITAL 3, and needs to be changed to a metaphor that still expresses the collection of documents, but does not imply a financial transaction.
Journal databases provide a model for this; the ACM digital library uses a ‘binder’, EBSCO ‘my folder’. Other databases (and eBay) provide checkboxes that allow users to ‘mark’ documents for later processing; however unless the marked documents are saved when the user navigates away from the page this is an inferior solution, because users are very likely to forget to perform the extra step of saving marked documents, as it does not fit with either of their primary goals (browsing search results, marking documents to register later interest).

The folder solution is best from a heuristic standpoint as it is one-click, leaving little room for user error, and it fits with other computer and real-world metaphors for filing documents which one already owns or has access to.

### 11.3 Visual mapping

The icons used to add and remove items from the ‘cart’ are small and hard to see, and do not indicate (particularly in the case of the ‘add’ icon) what effect they will have on the system (see Figure 15). It is clear from the plus symbol that it will add the document to something, but as there is no visual connection between the plus symbol and the ‘Quick collection’ it is not clear what the document will be added to. The minus symbol on the shopping cart is very similar to the universal road sign for ‘No Entry’, and this could prove very confusing, leaving users unable to delete documents from their quick collections. These confusing visual signals and the lack of visual mapping between the quick collection and the add and remove buttons makes it unlikely that users will master this feature without significant experimentation, so many users will never have the benefit of it.

### 11.4 Consistency

The ‘add’ and ‘remove’ icons used for the shopping cart in VITAL 3 are the plus and minus symbols, respectively, while to remove a search facet an ‘x’ is used. This requires users to interpret and remember a greater number of symbols than if consistent symbols were used.

The VITAL interface uses a one-click system for the shopping cart mechanism, which is a good choice from a usability standpoint. However, other systems that use a one-click mechanism with an icon, including Fishpond.com.au (a bookstore), EBSCO, and the ACM Digital Library place their icon on the right hand side. As an icon is more intrusive than the checkboxes used in two-click systems, and to allow users to read a complete title before committing to adding it to their collections, having one-click icons on the right is plausibly more usable than if the add mechanism were on the left.

### 11.5 Simplicity

The save/email citations dialogue (see Figure 16) could be better designed for user privacy and simplicity. Saving and emailing involve different steps, and have different purposes, from a user perspective: One involves sending an email so users can use the citations on another computer, the other involves choosing a disk location to use the citations later on the same computer.

Figure 16: Save/Email dialogue.

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23 See for example (“Figure 2B-9 Long Description”), which shows the US ‘No Entry’ sign, and (Comparative Study of Road Traffic Rules and Corresponding Enforcement Actions in the Member States of the European Union, p. 451), which shows the UK No entry sign.
To preserve user privacy, users should never be asked for their email addresses unless there is an immediate use for those addresses. The VITAL 3 interface, by combining email and save functions and putting the email dialog space first encourages the users to enter an email address, when they simply want to save their collections to disk (they also have to choose a subject line, though this is not such a grave problem as it has a default, and so neither requires any cognitive work nor invades the user’s privacy).

To simplify this dialogue and protect user privacy, it may be best to have two separate dialogues (one for save and one for email), or it might be best to change the order of the dialog, so that users are first offered the option to save to disk, and only then asked for an email address (it is impossible to say which of these options is better without user study).

11.6 CSS problems
The save/e-mail dialog’s text-entry fields are too wide for the bounding box the dialog is in, meaning they do not appear as proper boxes (as seen in Figure 16). The font chosen for the labels is too large, and this means that the labels for the text boxes do not align properly with the text boxes. This means the text boxes are non-standard in appearance and inadequately labelled, making the save/email feature harder to use.

11.7 Meeting user needs
There is real scope with a full-text system like VITAL 3 to make researchers’ lives easier, and the shopping cart feature is missing one such opportunity. Users searching a full-text (or partially full text) system are probably looking for full text articles, and the shopping cart feature could allow users to download interesting articles in bulk. If this feature were to be offered, it would have to be optional, because users may not want to download the text of items in their cart (or may not have the email quota size or disk space), but it should be offered.

11.8 Key recommendations for the shopping cart feature
• Change the metaphor
  The shopping cart does not work as a metaphor for goods that are free, and not for-fee, and is in fact misleading in a way that may confuse users about what the repository is for. Move to a folder or binder metaphor.
• Put the ‘cart’ on the right
  This will allow users to read titles and then add the associated documents (if they are interesting) to the cart in a left-to-right workflow.
• Map between the ‘cart’ and the collection better
  Make a clear visual link between the ‘add to cart’ and ‘look at the contents of my cart’ functions (this link should be clear whether there are items in the cart or not—the empty cart and the cart with items in it should be clearly related to items that have and have not been added to the cart). The location of the cart on the page can help make this association clearer. EBSCO does a good job of this.
• Make the add and remove icons consistent and clear
  Use consistent ‘add’ and ‘remove’ icons throughout the interface (so removing a search filter will use the same remove icon as removing an item from the cart). It should be clear what these icons represent, meaning the white minus on a red background should be changed—it looks too much like ‘no entry’.
• Re-organise the save/email function
  Redesign the interaction to make it clear that the user is only required to enter an email address if they wish to email the citations to themselves—it is possibly best to separate these functions altogether. Allow the user the option of also saving/emailing the full-text of the articles they have selected, where it is available. Fix the CSS, so that the text entry boxes fit within their bounding box, and the labels are clear.
12 The ‘breadcrumb’ navigation aid

Breadcrumb navigation, if done right, can give users cues about site hierarchy and their location within it. The VITAL breadcrumb trail is in the traditional location under the title at the left of the screen.

12.1 Positive aspects of the breadcrumbs

The breadcrumbs in VITAL are well conceived in that they are intended to be hierarchical, rather than reflect the user’s history; this gives users a good overview of the site, and does not increase disorientation if they get lost (as chaining their history together would)\(^\text{24}\). The breadcrumbs in VITAL are also in the position where they are most likely to be used, that is to the left, and under the page title\(^\text{25}\).

12.2 Clarity problems with the breadcrumbs

Breadcrumbs should make a clear visual distinction between the current page, and the links in the hierarchy. With the default stylesheet for VITAL 3, this distinction is not clear at all; visited links are dark grey, and unvisited links and non-linked text are both black (see Figures 17(a) and 17(b)). Links need to be clearly defined and distinct for best web usability, and this is even more the case in breadcrumbs (a site hierarchy is not useful to a user who cannot tell that it is interactive).

More problematic, though, is that the breadcrumbs in VITAL 3 do not really reflect the site hierarchy. This problem occurs for two reasons. The first of these reasons is mislabelling (browsing a collection by title, viewing search results, and looking at a listing of all documents all produce the same breadcrumb trail: Home > List of titles), which is relatively easy to fix. The second reason this problem occurs, though, is harder to deal with: many aspects of VITAL 3 simply are not hierarchical. A document may be in more than one collection (see Figure 18 below), and may also be displayed as a search result. The relationships between documents and collections are likely to be useful (items by the same author, items from the same organisational unit within an institution), but they are not hierarchical. In this instance, Jakob Nielsen recommends tying the breadcrumbs to “abstract or general concepts” (Nielsen, 2007), and says that databases could be breadcrumbed by attributes users have selected. This approach could work quite well in VITAL 3, provided we are willing to forgo the extra information about attributes users have not selected (for example other collection memberships). Unfortunately this approach makes breadcrumbs more closely resemble browsing history, nonetheless it still provides an extra navigational cue while being in keeping with the conventional hierarchy of breadcrumbs.

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\(^{24}\) Jakob Nielsen wrote a column on Breadcrumbs this year, see (Nielsen, 2007).

\(^{25}\) Usability news published a study about the use and usefulness of breadcrumbs in 2003 (Rogers & Chaparro, 2003)—this demonstrated the best location for breadcrumbs experimentally.
12.3 Key recommendations for breadcrumbs

- **Make the distinction between linked and non-linked text clearer**
  This is a general concern in any website, but it is particularly important for breadcrumbs. Use underlines and/or colour to distinguish between links and text.

- **Make the breadcrumbs hierarchical**
  Insofar as is possible, breadcrumbs should be hierarchical, and reflect something about the related documents and activities that may be of interest to the user. The breadcrumbs should distinguish between search results, all documents, and documents within a collection, and collection membership should not be listed in a hierarchical way. Possibly collection memberships should be listed as part of a document’s metadata and only shown in the breadcrumb trail if the user has navigated via a collection.

13 Communities and Collections

Communities and collections allow repository managers to group documents in ways that their users may find useful. These collections could be seen to replace the concept of a journal in a journal database, or a special collection in a physical library, or works from a special-interest publisher or from a specific genre in online bookstores.

13.1 Positive aspects of communities and collections

The grouping of documents under certain circumstances provides the opportunity to add significantly to users’ browsing experiences. Potentially these collections can be used to show users other documents they may find useful because they were published by authors from the same department, or under the same grant, or in the same journal. It is especially good that (unlike a physical collection) an item can be in many collections simultaneously (without any additional disk space required), providing users with the maximum possibility of discovering individual documents, and ensuring that repository managers can provide comprehensive collections.

**Communities & Collections**

The following list represents the communities represented by this repository and collections contained within them. Click on a name to view that community or collection page.

**ARROW Central Photos**
- Training - Swinburne
- APSR event - Adaptable Repository and Market Day
- Training - QUT
- MACAR
- Training - Ballarat
- RUBRIC visit - Toowoomba
- UniSA Repository launch
- Overseas Trip June 2007

**From prehistory to history [electronic resource] : shared perspectives in Australian heritage interpretation /**
- Arithmetic /

**Monash University Faculty of Art & Design**
- Solviod project
- Department of Design

**Monash University Faculty of Business and Economics**
- Department of Management
- Department of Economics
- Department of Management: WORKING PAPERS SERIES
- ***DEVELOPMENT COLLECTION***

*Figure 18: Communities and Collections homepage*
13.2 The name
Even though a reasonable justification is given on the communities and collections homepage for the name of this section of the site, without the justification the ‘communities’ part of the name is not likely to be well understood by users. Not only could this name cause confusion, it may not actually be accurate dependent on what repository managers use this feature for.

13.3 Sorting
The communities and collections are not sorted alphabetically on their homepage (communities are sorted alphabetically, but within those communities collections are sorted in order of creation). To users this sorting will appear random, and it will make individual collections hard to find. Either this sorting should be strictly alphabetic, or it should be controlled by repository managers.

13.4 Context
Once users are using a collection, whether they navigate to it from the communities and collections page or from the breadcrumbs or somewhere else, there is no indication which collection they are in. A yellow box is provided at the top of search results pages and browse pages to let users know they are in a collection, just not which one. The only way to navigate back out of the collection is to go to the homepage, or do a search after unchecking the box that is marked ‘within collection’. The breadcrumbs do not reflect the name of the collection, nor is it contained in the page title or any other contextual information. This lack of contextual information makes it very easy for users to become disoriented, not knowing what collection they are in (or even that they are in a collection, possibly), nor how to get back out. When a user is in a collection, it needs to be very clear they are working within that collection (and not the whole repository), and it also needs to be clear how to navigate back to working with the whole repository.

13.5 Key recommendations for communities and collections
- **Change the name**
  Change the name to something that users will understand, and that will be representative of the uses this feature is put to within a repository (this may vary from repository to repository). A generic suggestion would be to simply call it ‘Collections’.
- **Clarify context**
  For each area within a collection make it obvious which collection the user is in, perhaps by including the name as part of the title at the top of the page, and in the header title that appears at the top of the browser, and in the breadcrumbs.
- **Make it easy to exit a collection**
  Make it easy for users to find their way out of a collection. Ways to do this might include providing a choice between searching the current collection (by name) and searching the whole repository between the search box and the search button, and by providing links to ‘browse all’ at the top of browse pages (however, these are just suggestions, and user testing may show different approaches to work better).
- **Sort collections alphabetically**
  Sort community names and collection names alphabetically so that users have some sense of where to find individual collections.

14 Conclusions
This report describes the findings of an in-depth heuristic analysis of VITAL 3. Most of the public interfaces were explored, including the menus, searching, browsing, collections and the document view.

A number of concerns were found with terminology, clarity, consistency with systems used for similar tasks (notably online journal databases, online bookstores, and online auctions), mappings,
and efficiency. Some of these problems were fairly pervasive, others were restricted to a single area of the site.

The news is not all bad, however: VITAL 3 offers a wide range of features, many of which are clearly conceived with the user in mind. The flexibility offered in browsing, the new option to search for only documents that have full text available in the repository, and the ability to create a personal collection of interesting documents from a single session all make it easier for users to find and organise their documents. If the implementation of these features is brought in line with good usability practice, VITAL has the potential to be a very powerful tool for information seekers.

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16 References


