Metaphors for discovery: how interfaces shape our relationship with library collections

Georgina Hibberd
School of Design
University of Technology, Sydney
Australia
Georgina.Hibberd@student.uts.edu.au

ABSTRACT

Library patrons are relying on graphical interfaces to not only find items but to browse and understand the context and scope of library collections. Current library interfaces favour goal-oriented search rather than open-ended discovery. They do not replicate the context provided by books on shelves, hence our experience of the library is altered. Removing the books from the shelves, however, provides us with an opportunity to explore the way in which order has dominated the metaphors used within library interfaces and to seek out new and potentially novel metaphors that do not seek to replicate the experience of the shelves, but nevertheless provide us with an experience that is rich and rewarding. This research pursues a practice-based approach to the development of a set of speculative prototypes that will seek to explore the role of metaphor in our experience of library collections. This paper describes doctoral work in progress.

Categories and Subject Descriptors

H.3.7 [**Information Storage and Retrieval**]: Digital Libraries – *User issues;* H.5.2 [Information Interfaces and Presentation]: User Interfaces – *Theory and Methods*

General Terms

Design, Experimentation, Theory.

Keywords

Interface design, digital libraries, visual communication, metaphor

1. INTRODUCTION

1.1 Background

In 2016 the University of Technology, Sydney (UTS) will open a new library. A significant feature of this development involves moving a large proportion of the collection to an Automated Storage and Retrieval System (ASRS). The ASRS will house books underground, making physical access to them no longer possible. Patrons will be able to request books from the ASRS, which will then be retrieved by a robot. Access will be possible only through digital interfaces such as the existing online catalog. Although we currently access the collection through this catalog,

when using an ASRS the retrieval moment is lost. When a robot retrieves the books from the shelves our relationship with the collection is altered: we are no longer able to understand or experience the physicality of the collection.

The changes at UTS are not unique. Many scholarly and research libraries are in the midst of changes that will affect access to their book collections: the New York Public Library, the University of Sydney library, and the (State) Mitchell library in New South Wales, Australia are just three examples [13, 21, 27]. In cases where books are being removed, (access curtailed or books discarded altogether), library patrons have expressed a feeling of loss [26, 33]; not a loss of books as merely objects but the loss of an *experience* [12]. Some frame these changes as an attack on their idea of what a library should be (you can't have a library without books [15]) while others are concerned with the loss of serendipitous browsing: no longer will they be able to browse the shelves and find items they did not know they wanted. "I look forward to browsing the reference shelves and other material freely available. This way I am able to make myself aware of material that is in existence. What one cannot see, one cannot ask for" [22]. Patrons are accustomed to using library interfaces but not in isolation [3]; they use interfaces in conjunction with the book on the shelves. Searches don't always end with the retrieval of a single item, further understanding of the collection is built through an engagement with the books themselves. Judgments and decisions are made within the retrieval moment, not only when using the interface to locate items.

1.2 Research Problem

Current library interfaces enable goal-oriented search rather than discovery. These interfaces do not replicate the context provided by books on shelves. For example, when browsing shelves we can visually identify the older books, those with shorter borrowing period labels (and are thus in demand) or those with multiple editions. Despite digital infrastructure providing the potential to sort information in almost infinite ways [30], the interfaces used within libraries paradoxically narrow users options. Library interfaces have a role to play in providing an environment for serendipitous connection and the majority of the current interfaces limit the potential for this. These interfaces are bound by the rules of library classification systems, without the benefit of the physical context they provide.

Research such as this has become more urgent with the gradual but inexorable transition to digital-only collections. The relationship we have with physical collections can not be discounted but it also can not be re-created in the digital realm. There is a need to understand not only how interfaces operate and how they can be 'usable' but also how they shape our relationship with library collections. [11].

1.3 Opportunity: the affordances of the miscellaneous

Whilst some express a sense of loss at the prospect of losing physical access to books, it provides interface designers with an opportunity to explore what is afforded by the potential of the miscellaneous, as described by Weinberger [30]. Once books are no longer publically accessible, they need not be in an order that enables them to be found by people but they do need to be encountered through an interface.

Weinberger explains how the way in which we impose order and thus access to physical objects and information has been freed by the digital. In Weinberger's three "orders of order" we have moved from a "first order" limited by matter, through a "second order" where information about objects is maintained separate from the objects themselves, but in physical forms, through to the "third order" which is digital and miscellaneous. Order is defined dynamically in the third order. For example, iTunes provides us with the ability to sort individual tracks in multiple ways, instead of being locked into a stipulated track order by the physicality of a vinyl record or CD. In an automated storage system, where books are stored by size and retrieved by robot, the catalog doesn't need to relate to the storage system because patrons don't have to locate the book itself. This provides us with the potential to explore what could be done when you break the relationship of the library's classification system to the physical arrangement of books on the shelves, when users no longer need to understand their physical location. There is an opportunity to explore the potential of new and novel metaphors to both represent the collection and to aid in experiencing and understanding the collection.

The books on shelves in libraries are most often arranged according to the classification system employed by the library. Once patrons can not retrieve those books, the classification system no longer functions as a way-finding tool. In the case of the UTS Library, the Dewey number acts as a direction for the patron, and a location for the book. This patron-centric view of the library, where the processes and systems involved in getting books in to the library and storing them are of no real concern, provides us with the opportunity to explore what can occur within an interface when the patron no longer needs directions and the book no longer needs a location. Developments like the ASRS give the library interface the potential to be freed from library classification systems and the influence of the metaphors associated with these systems.

Current interfaces are underpinned by the library convention of a stable, over-arching order. They are not exploiting the flexibility of the third order, which is what this research seeks to do. In terms of a design approach it is suitable to ask what the possible affordances of the "miscellaneous" are in this instance. For example, are library patrons reliant on a sense of an over-arching order for their conception of the 'collection'? Do they build their ideas of what the collection is and how they can access it through their understanding of and relationship to the dominant order? A different conception of order, as enacted within a library interface, is necessary for us to approach interface metaphors that move beyond the transactional and limited browsing metaphors offered in current interfaces.

2. RELATED WORK

This research relies on work from several different disciplines including interface, interaction and visual communication design, library and information science and digital humanities.

2.1 Interface design and theory

2.1.1 Information retrieval models

The work of Dörk, Carpendale and Williamson has reconfigured and extended retrieval models used when designing exploratory interfaces [6, 7]. Dörk et al have recognised the narrowness of information retrieval models used to design library and other collection interfaces and how this narrowness can constrain design. They use the figure of the flâneur to conceptualise an information-seeking behaviour that is meandering, whilst effective. The model of the flâneur opens up the possibility of an engagement with a library collection, through an interface, that is pleasurable, poetic and serendipitous.

2.1.2 Visualisation

The interfaces developed by Dörk and his colleagues encourage the information flâneur. They make use of interactive visualization techniques to encourage users to make serendipitous connections. Recent work has seen Dörk, Comber and Dade-Robertson [8] seek to explore the concept as the monad as revived by Latour, Jensen, Venturini, Grauwin and Bouillier [16] in an information visualisation context.

"The Bohemian Bookshelf" [28], developed by Thudt, Hinrichs and Carpendale, responds directly to the loss of books in libraries and bookshops. Its interface includes five different visualisations that provide users with different views of a collection.

2.1.3 Generous and rich prospect

Interfaces developed by Whitelaw for museums and other large collections employ alternatives to search [32]. Whitelaw suggests a 'generous interface' may provide an improved experience of large digital collections. Examples of Whitelaw's 'generous interface' can be seen in his work for the National Gallery of Australia's *Australian Prints and Printmaking* site [2] and The Visible Archive (National Archives of Australia) [31].

The importance of 'generous' interfaces can not be downplayed, given that for many, the interface will be the only way in which they experience the original artifact or material, they will not experience it physically. This is not entirely the case with a library collection. Although the initial interaction with the collection may be through an interface there is still, for a large part of the collection, the prospect of engaging with the book. In this sense, library interfaces are wrestling with a different problem to those of museum collections. These interfaces do however have to negotiate the fact that some library users may not ever enter the physical library itself [23].

The work of Reucker, Radzikowska and Sinclair [25] on 'rich prospect interfaces' has similarities with Whitelaw's 'generous interfaces'. Like Whitelaw's, rich prospect interfaces aim to be generous in what they display (meaningful representations of every item within a collection on initial screens), items can be manipulated by users (filter, zoom, mark) and link to more detail on demand. For Ruecker et al, the ability to *see* an entire collection should allow the user to get a sense of the entire collection and its boundaries. Rich prospect interfaces should then not only enable a user to *find* or *discover,* they should also assist the user in *understanding* the collection itself. This is relevant for library interfaces, particularly when other methods of understanding the collection, for example, physically moving amongst the collection on shelves, are no longer possible.

Bolter and Gromala's [4] analysis of the interface through the lens of digital art provides this research with a valuable framework through which to assess current library interfaces and develop alternatives. Bolter and Gromala argue that we need to look *at*

interfaces, rather than merely *through* them. Interfaces are representations of knowledge in and of themselves, not merely gateways to knowledge. This research will explore the visual presentation of library interfaces through this lens.

Interface design and theory has been dominated by a scientific approach, this research will also respond to Johanna Drucker's [9, 10, 11] call for a 'humanities approach to interface theory'. For Drucker, there is an assumption underlying current theories that interfaces are 'neutral'. There hasn't been sustained consideration of the metaphors used within them and the assumptions that underpin them. Interfaces are viewed as *pragmatic* and *instrumental* rather than *rhetorical* and *persuasive*.

3. METHOD
This research is a practice-based exploration of potential library interface metaphors that will result in a set of speculative interfaces. It will employ design methods in the generation and application of knowledge.

1. Exploration and data gathering

This will include a literature review covering the historical development of library interfaces in order to track graphical, compositional and navigational conventions.

This review will also investigate critical approaches to reading interfaces including:

- the digital art lens used by Bolter and Gromala [4]
- the humanities-based approach of Drucker [9, 10, 11]
- the aesthetic critiques of interface Udsen and Jorgensen [29], as well as Andersen and Pold [1].
- new-media critiques by Laurel [17] and Manovich [18, 19]

2. Data processing, analysis and interpretation.

Visual methods will be used to process and analyse the existing library interfaces. This will include design practice and enquiry through mapping, visualization and wireframing. Interpretation of data will be through visual analysis, graphical reading practice and theoretical framing.

3. Prototyping

A speculative design approach will be taken to prototyping, which will be used as a method through which arguments will be explored and made [14].

4. FURTHER WORK
4.1 The murmuration: a metaphor for discovery?
Prototypes developed during this study will initially seek to explore order and its role in library interfaces by employing the metaphor of a bird murmuration. (Preliminary work on the murmuration metaphor has been undertaken over the past 18 months). A flock of birds is thought to adjust its shape and order "on the fly", [5] in response to outside stimuli, like predators, and through interaction between individual birds. This property could be used to experiment with access to the collection and conceptions of order within the collection itself.

The murmuration provides us with some potential ways through which we can explore the idea of a collection:

- with porous, ever-changing boundaries
- that responds to local actions rather than obeying an over-riding order
- that moves continually, both through its porous nature and through patron use.

Whilst there are scholars who have explored the use of flocking or swarm behavior in relation to information [20, 24], it is the visual and metaphorical properties of the murmuration that will be explored through prototypes. Alongside an organising and visualising principle, the murmuration allows us to ask: How does this representation change the library patron's experience and perception of the collection? What affordances are created when the collection is experienced as a murmuration? And, what are the likely consequences of this change?

5. EXPECTED CONTRIBUTION
It is expected that this research will contribute to interface theory beyond the discipline of visual communication design. It will do this by providing a visual analysis and interpretation of library interfaces that will ask questions not currently posed from within other disciplines, with the aim of opening space for those disciplines to ask similar questions.

It will contribute to an emerging cross-disciplinary movement away from transactional goal-oriented search towards more open-ended and flexible approaches to collection engagement. Visual communication design offers a perspective that will contribute to a broader understanding of the relationship of the visual to our use of library interfaces.

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