Blended Shelf

Reality-based Presentation and Exploration of Library Collections

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Abstract

This extended Abstract presents the user interface Blended Shelf, which provides a shelf browsing experience beyond the physical location of the library. The following text summarizes the master thesis and its results about the Blended Shelf. This includes the definition of basic design goals, an analysis of related work and the actual implementation of a comprehensive prototype. It also shows the results of its evaluation in the wild during a ten day user study. It concludes with a summary of current and future efforts to transfer the concept into the real library world.

Keywords: Blended library, Shelf browsing, Reality-based interaction

Preliminary note

The following abstract bases not only on the underlying thesis but also on other publications and talks by the author. These works and the thesis are online available at http://www.eikekleiner.de/publications/.
For a better understanding of Blended Shelf it is recommended to watch this video: https://www.youtube.com/watch?v=pMdMGt4Yxuw.

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1 Introduction

Browsing through shelves offers many advantages for library users. The visual feedback embodied in a book is less abstract than dealing with purely metadata. The systematic presentation of the collections allows users to explore thematically related items that are located close to each other. In addition, *serendipity* is already explicitly supported as an inherent part of the library as Rice (2001) put it: "Serendipitous findings are one of the consequences of browsing in the library […]".

A review of literature revealed various shelf-oriented UI approaches (e.g. Detken 2009, Rauber 1999, Thudt 2012), but it seems that no approach focuses on a digital but reality-based pendant of the shelf browsing experience.

The thesis investigates if users will benefit from transferring the well-known process into the digital domain with little learning effort and an intuitive perception of the interface. Therefore the software and user interface Blended Shelf was developed and evaluated.

It uses real-world attributes in the visualization combined with an interaction concept derived from the actual use of physical shelves. This allows maintaining the serendipitous effects common in the physical library. At the same time, well-chosen trade-offs between expressive power and reality (Jacob 2008) expand the shelf browsing with digital functionality, such as instant reordering, analytic keyword searches and more.

2 Design goals and implementation

Based on an analysis of the browsing process, background theory and the related work the thesis develops five design goals which are considered a necessary base for a digital browsing system:

1. Integration of spatial characteristics
2. Categorized and ordered presentation
3. Use of physical and visual properties
4. Support for serendipity and advanced searching
5. Access to objects or their representations.

Blended Shelf is developed along these design goals. The software runs on various hardware settings (fig. 1). It serves around two million items, which represents nearly the entire collection of the Library of the University of Konstanz.

Figure 1. Different hardware settings

The visual design of the application is simple. The interaction happens through direct touch manipulation on the objects itself. The foldable menus are arranged at the side. The whole appearance depends on the integration of cover images (fig. 2).

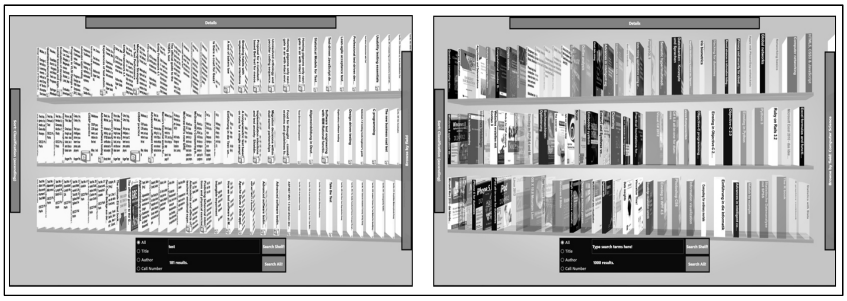

Figure 2. Comparison of different amounts of cover images

The collections in Blended Shelf get sorted by the classification of the physical library. This builds clusters by topics (fig. 3). Users are able to re-order the collection by *author*, *availability*, *color*, *size* and more. Borrowed books get rendered semi-transparent (fig. 3, second book from the right).

Figure 3. Thematic cluster of the painter *Dürer*

Users can zoom in for details and out for an overview (fig. 4). Another gesture changes the user's horizontal perspective towards the shelves.

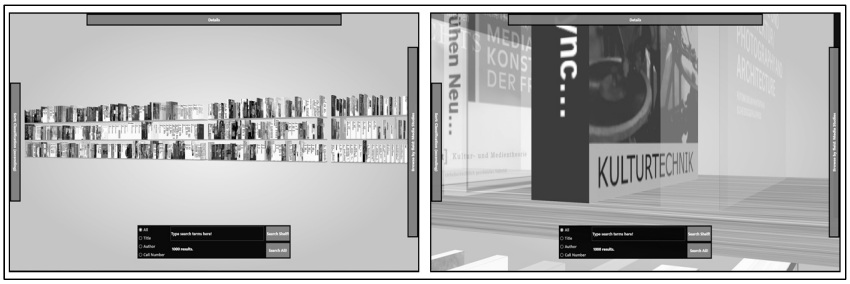

Figure 4. Different zoom levels

When possible, the items get displayed according to their real size. This gives visual hints about the kind of item (fig. 5).

Besides the browsing by department (fig. 5) it is possible to search the selected shelves or the whole collection via keywords by *author, title* and *call number*.

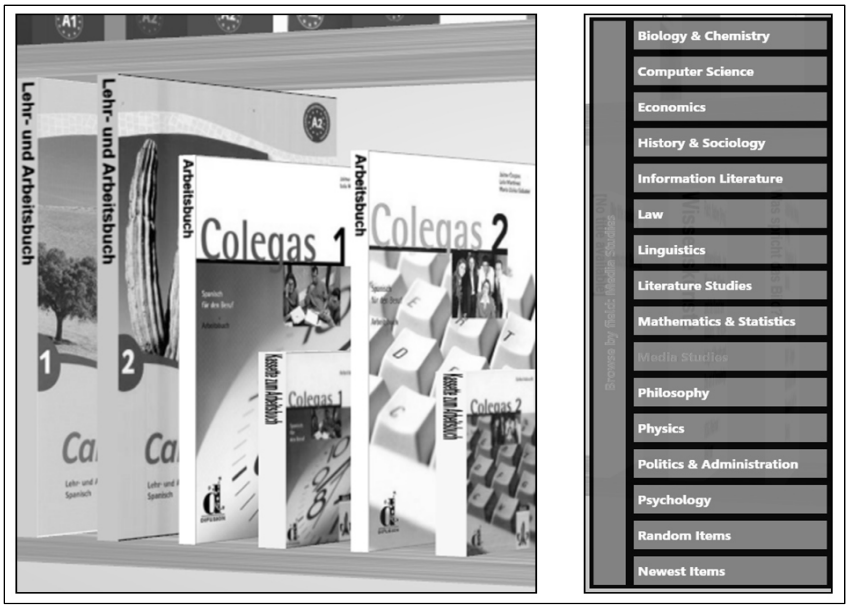

Figure 5. Left: Visual clues. Right: Selection menu of the departments

After the selection of an item, two QR codes are presented (fig. 6). One leads to the library catalog and another one to a map of the physical location of the item (fig. 7).

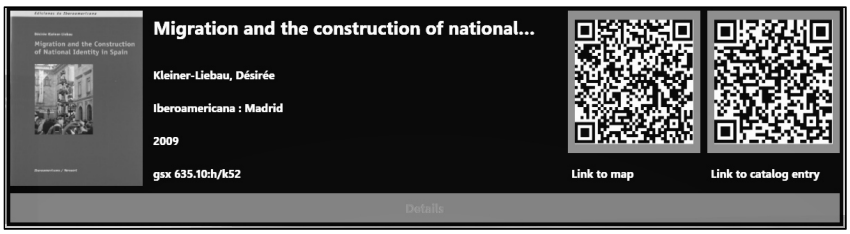

Figure 6. Detail view

By redirecting the user from the public display to his personal device, the information privacy and security issues stays under his control.

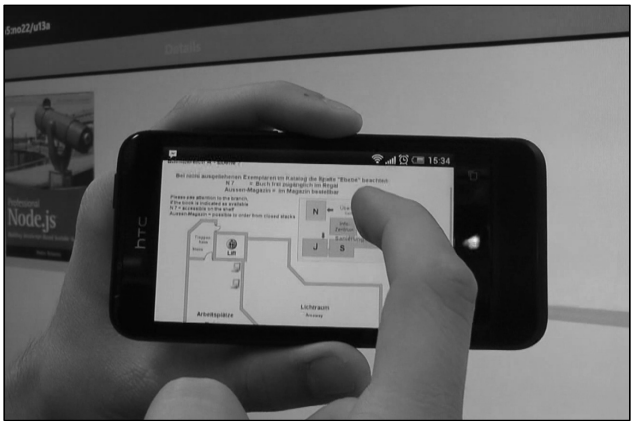

Figure 7. The library's service presenting a location map

3 Study and results

The study covered three main questions to get data for the further development of the system and concept:

1. Is there demand for the system?
2. Is Blended Shelf usable?
3. Are the design goals the correct ones?

The study took place in the field (main entrance of the library). To get method triangulation three different instruments for the data collection were used:

1. Observation: hidden and involved
2. Interviews: users and experts
3. Log data: intentional and explorative.

The system contained data about around two million items and was public available for 10 days (24/7).

The study showed that library users accept and use Blended Shelf. It was possible to measure over 350 single usages. The majority of the interviewed users stated that they want to use Blended Shelf again.

The study exposed potential for improvement regarding the usability: A lot of users wanted to push the QR codes like buttons because of a wrong

affordance. Also the users wanted to peek into full texts directly on the Blended Shelf and not only on their personal devices. Users wanted to see more detailed metadata in the detail view and request a more differentiated browsing approach. Not all users were able to detect and use all functionality of the system because of the coy arrangement of the menus. In general, the users liked the visual design of the UI and supported the heavy use of visual clues like the size of books and its cover images.

All functionality and interaction implemented because of the five design goals was rated as useful. The users requested one more major topic during the study: *Personalization*. This was stated in many examples like the ability to create personal shelves or to get recommendations based on personal demographics and usage data. For future work personalization should be considered as the sixth design goal.

4 Conclusion, current and future work

The thesis shows that a need for reality-based and shelf-oriented browsing systems exists. Based on the study results it is possible to further develop Blended Shelf into a user-friendly, place and time independent browsing interface. The system showed the necessary variability of hardware settings and operational stability to gather usage data over ten days from hundreds of uses. The design goals defined within the thesis proved to be relevant and could be enhanced further with the users input from the interviews.

The development of Blended Shelf has not reached its end with the authors' graduation, but is currently being pursued with great commitment. A project under the lead of the Library of the University of Konstanz (Kohl-Frey 2014) has the goal to implement the Blended Shelf for all university libraries of the state of Baden-Württemberg. The software should later be available for other interested institutions. For the author it is possible to experiment with an alternate HTML5 version of the Blended Shelf at the Zurich University of Applied Sciences (Kleiner 2014).

The transfer from research into real-world usage and operations confirms the direction the thesis suggests. These efforts will also give new opportunities for comparative studies between the different systems and long-term studies about changes in usage over time.

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