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The usability issues of faceted navigation in digital libraries

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Introduction

The last decade transformed faceted navigation[1] from a "nice-to-have" into a "must-have functionality" for all online web services that contain a search functionality. All commercial websites have undergone this change from online clothing stores to travel agencies, all driven by the wish of facilitating instant access to their products. From commerce it shifted to other domains, such as libraries, as well. Today, faceted browsing is one of the most common functionalities in library products, built to improve a search function and enhance already existing catalogs by preventing zero result hits and offering users the possibility to look for objects without knowing exactly what they are looking for. Commonly, the faceted navigation of today's library catalogs' include facets such as authors, subjects, formats, printers, publication year etc. Nevertheless, all other field related to existing metadata can be used as facets.

As facets are sold to users as an advantage and improvement of an existing service, it is important to assure, that the user's perception goes along with or differs from these assumptions, hence the reason for this paper in which we want to discuss the following questions concerning faceted navigation:

1. What is the user's perception of faceted navigation in digital libraries?
2. Which design issues play an important role for a user-friendly application of faceted navigation in the context of digital libraries?

The answers to these questions will be given in the context of the project ACCEPT, a subproject of a Swiss national initiative e-lib.ch. The subproject was installed to analyze the usability and usefulness of digital libraries by using quantitative as well as qualitative methods for user centered design. In this context, the faceted navigation has been subject of seven qualitative usability evaluation studies. In 2009, a focus group with seven participants from the field of information science has been conducted with the aim to discuss about interface design issues of the Meta catalog swissbib.ch. Somme common usability tests with thinking aloud method and the use of a usability software have been directed between 2010 and 2011. One evaluated the manuscript website e-codices.ch, by comparing it to another manuscript database called Penn in Hand, another concentrated on the faceted navigation of swissbib.ch by comparing it with the correspondent functionality in SIRIS and the last one evaluated the digital library website e-rara.ch by using eye tracking technology. As a last source of data, three online usability tests have been analyzed more in detail. They have been conducted between 2012 and 2013 using in all cases an online usability testing software. In 2012, the search tool RODIN has been evaluated online. One year later, an online usability test has been conducted in order to evaluate swissbib.ch and last but not least, an online evaluation has been directed in order to evaluate the website of e-lib.ch. Based on these results, the above-mentioned questions shall be answered.

[1] used equally for: faceted browsing, faceted search

1. **What is the user's perception of faceted navigation in digital libraries?**

Generally, the literature shows that filters provided through faceted navigation are considered to be useful to end users. Results of several tests have shown that the participants' satisfaction is higher with a faceted system (Uddin, Janecek, 2007; Zhang, Marchionini, 2005; Yee et al., 2003; cited in Fagan, 2010) than with general search forms. Still, the initial reactions to the faceted interface may be cautious, as it might be seen as different or unfamiliar. This concerns in most of the cases users who are new to the concept of faceted navigation. (Yee et al, 2003; Zhang, Marchionini, 2005, cited in Fagan, 2010)

Another important result is the fact that faceted navigation has the effect of more successful searches (Uddin, Janecek, 2007; Zhang, Marchionini, 2005; Teevan, Dumais, Gutt, 2008; cited in Fagan, 2010). Yee and English stated that facets help avoiding dead ends, which features the original sense of faceted navigation (Yee et al, 2003, English, 2002; cited in Fagan, 2010). It has also been proved that users are faster with facets than with simple, well-known search interactions (Uddin, Janecek, 2007, cited in Fagan, 2010).

The results of ACCEPT confirm these general findings. In five of seven studies, the general opinion about faceted browsing was positive (2, 3, 4, 5, and 7) [2]. First of all, participants mention that facets accelerate and facilitate the search process (4). By starting with a simple search and getting machine-generated possibilities for further filtering, the intellectual implications are smaller than with advanced search forms and the overall research process becomes faster (3, 4, 5, 7). Furthermore, in one study, a user discovered documents by using the facets that he wasn't aware of (2).

Negative points were mentioned in two studies, whenever users were confronted with facets for the first time (4 and 5). In both cases, uncertainty about the functionality as a whole and about how the generation of facets works were stated.

2. **Which design issues seem to play an important role for a user-friendly application of faceted navigation in the context of digital libraries?**

On behalf of the purely performance oriented points in the chapter before, there are also several design instructions concerning the user-friendly design of faceted navigations. As Hearst pointed out, a compromise has to be found between an elaborated and well-working functionality and a clear and comprehensible design of it (Hearst, 2006 and 2008). As a matter of fact, faceted navigations tend to be overloaded and therefore confusing to users. That's why recommendations concerning visual options, the choice of facets, the grouping of latters and labels, such as those of Reinhard (2009) or Hearst (2006, 2008) should be taken into account and analyzed regularly by users.

Experience in ACCEPT underlines above mentioned conclusions and has detected furthermore several returning issues. It turns out that there are some 'unwritten standards' concerning a user-friendly and useful design for faceted navigation. These mistakes are elaborated in order of their frequency of appearance within the studies.

[2] Please find the complete bibliographic reference of the study at the end of the text

Labelling

The most important problem, which occurred in four studies (1, 4, 5 and 6) during the interaction with faceted navigation, concerns undetailed or unclear labelling. As shown in Figure 1, the facet "authors/collaborators" makes no distinction between authors and contributors. During the test, users criticized this element, and asked for more simplicity by using i.e. only the label "author".

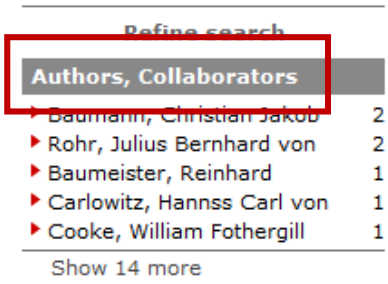

Figure 1

Number of displayed facets

The number of displayed facets as well as displayed results are regularly discussed issues, which include questions about design and performance. In four studies in the context of ACCEPT, this topic was indeed considered to be a problem (1, 3, 4 and 5). In this case, users didn't see the possibility to enlarge the number of results, which may be an indicator for the lack of a comprehensible design (Figure 2).

Figure 2

Breadcrumbs (chosen filters)

Once, a facet has been selected by a user, generally a breadcrumb appears, which indicates to the user, which facets he/she has chosen (Figure 3). Results of three studies have shown that these breadcrumbs are often not looked on, because they are too small or too similar to the general faceted navigation design (Figure 4; 1, 4, 5,). It would be preferable to display them in a different visual display and slightly adapt the design (Figure 4).

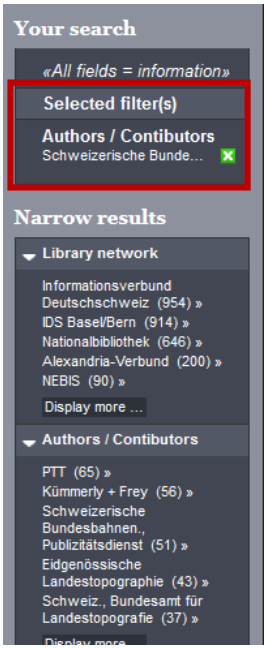

Figure 3

Figure 4

Restart

In two studies, the following issue was a problem: Once clicked on a facet, it remained active, even after a new search (1 and 5). In worst-case scenarios, users didn't find any results because of the still activated facet (Figure 5).

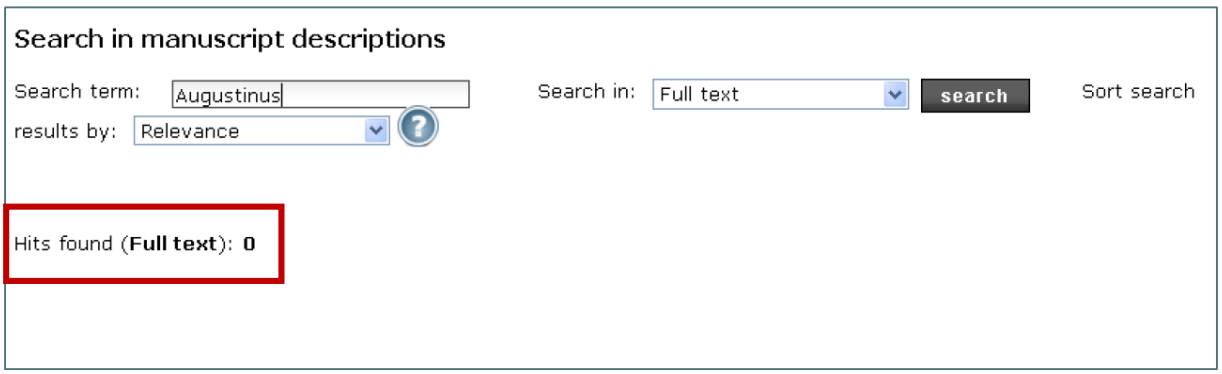

Figure 5

Font Size

The font size should be mentioned as an issue that deals with accessibility. This problem was raised in two studies (4 and 7). Consequently, users are not able to read the content of a website properly and won't be satisfied.

Year range

The last issue mentioned concerns the display of the "year". One of our study revealed different design topics concerning the "year" facet, to which all designers should pay attention (5). As shown in Figure 6 and 7, different periods of years can be chosen. This reveals two questions: one concerning the degree of detailing the display of the year, another one concerning the importance for the retrieval of relevant results. First of all, no year should be used in double. The solution in Figure 7 below illustrates the difficulties. If a user wants to find documents of 1960, he or she doesn't know if the documents can be found in 1950-1960 or in 1960-1970. The left example shows how it could be solved differently. Furthermore, ranges should get smaller when filtering more into detail. An alternative option, which has been mentioned positively are chronological sliders (Figure 8).

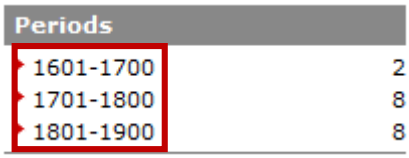

Figure 6

Figure 7

Figure 8

Display of faceted navigation on the right or left

Another important discussion is about the position of facets, which means if they should be shown on the left or the right-hand side. Test results in the context of ACCEPT revealed opposite outcomes. In one study including eye tracking, the results showed that facets on the right hand side are looked at (4). As can be seen in Figure 9 below, participants (n=11) scanned the facets, even if they were on the right hand side. Still, in another study, results indicated that

the faceted search on the left-hand side seemed to be a problem and users didn't use the functionality because of its weak visibility (7).

Figure 9

Conclusion and final recommendations

This paper wanted to answer two questions, about users' opinion of faceted navigation and which design issues have an impact on high user satisfaction. In order to answer the two research question, seven qualitative and quantitative usability studies have been conducted in the context of the project ACCEPT, a subproject of the Swiss project e-lib.ch.

It may be resumed that user perceived faceted navigation positively, with two exceptions for first time use. In this case, users stated that the functionality permits a more efficient search and guides them to the item of interest, by sometimes finding even more relevant hits. Furthermore, they underline the simple design and the rapidity of the service. These results underline previous findings.

As for the second research question, seven returning design issues were detected and described in order of their frequency of appearance.

a. The studies showed that the most often cited issue were unclear facet labels. Useful and clear content is as important as a good system performance. It must also be assumed that users already have an idea of what they are looking for, a special term or a specific document, and if the labels diverge too much from this idea, they get confused. This underlies the importance of implying users into the labeling process by conducting a priori card sorting tests (Courage, Baxter, 2005).

b. The decision about where to position the facet navigation, either on the left or the right hand side of a webpage, should go along with the entire design of the website. In any case, the users' eyes should be guided to the position of the facets. These findings don't go along with conventions, which say that users expect the navigation menu on the left-hand side (Nielsen, 1999) and the real application in the field of e-commerce (webusability.co.uk, 2012). Still, taking into account other analysis (Kalbach and Bosenick, 2003), it can be summarized that the position does not seem to play such an

important role, but that it is important that the website's design guides the user's eye to the direction of the facets.

c. Design questions about the number of displayed facets and the breadcrumbs have to be answered according to end user's needs. Too many facets may not be a problem, if design solutions, which permit to open or close different facets, are employed. A so called «accordion» may be a possibility to hide or display more filters. Furthermore, result numbers must be enlargeable by implementing a «Display more» option beyond every facet. One rule is that users should not have to scroll, but instead see all facets at one glimpse (Hearst, 2006; Lemieux, 2009).

d. Concerning breadcrumbs, a clear separation of the chosen facets may be a satisfying solution. Hearst even proposes that the breadcrumbs should be in a separate visual component of the webpage (2006).

e. As for the year range, it is important to show every year only once. In any case, the choice has to correspond and be based on end users' opinions and needs. A good solution may be sliders.

f. A purely performance oriented issue concerns a restart after a new search. As users can not have an impact on this functionality, it is of high importance that it works well. In the contrary case, it prevents them of getting appropriate results in an effective way. It leads furthermore to confusion or anger, because users may think that they and their research competences may be the problem. All filters should therefore be reset when starting a new search.

g. A last issue, the font size, concerns accessibility. A digital library should be accessible for all users, even those with handicaps of view. The font size should at least be 12ptx on digital resources.

To finalize, as Hearst said already in 2008 "the time has arrived to find innovative but understandable ways to extend the faceted model, while at the same time retaining its essential usability. Different designers are experimenting with this but no clear good idea has emerged yet." This means nothing else that faceted navigation should be used in every case. But still, this implies as well that different solutions are asked for different contexts and different users need different services. That's why, a focus on the usability of faceted navigation should be given in every case in order to satisfy the target user group and put them in the center of the development of the online service.

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