Parallel Faceted Browsing

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CHI 2013 Extended Abstracts, April 27–May 2, Paris, France
ACM 978-1-4503-1952-2/13/04.

Abstract
The widely used paradigm of faceted browsing is limited by the fact that only one query and result set are displayed at a time. This demonstrator introduces an interaction design for *parallel faceted browsing* that makes it easy for a user to construct and view the results of multiple interrelated queries. The paradigm offers general benefits for a variety of application areas.

Author Keywords
Faceted Browsing; Subjunctive Interfaces; Event Modeling

ACM Classification Keywords
H.5.2 [Information Interfaces and Presentation]: User interfaces – Evaluation / methodology

Starting Point: Faceted Browsing
Faceted browsing (or faceted search; see, e.g., [6]) is a widely used paradigm for the exploration of a large repository of entities which has been used successfully in types of system ranging from e-commerce sites to applications for personal information management. It presupposes that each entity is described in terms of values of facets (which may be simple attributes or more complexly structured dimensions).

Figure 1: Screenshot of the parallel faceted browsing demonstrator.

(The interface is based on a card sorting metaphor: Each event in the repository is described on a single card. Starting with the pile of 899 cards covering all events, the user can pull out smaller piles that fulfill particular conditions. Consequently, each of the 9 piles shown in the screenshot corresponds to a different query that could be formulated within a normal faceted browsing system. The user can examine the results of each such query by clicking on the pile of cards to see thumbnail descriptions. Clicking on a thumbnail description causes a longer description to be shown.)

Table 1: General benefits of parallel faceted browsing.

Comparing Subsets of Results
: Since two or more sets of query results can be viewed at the same time, the user can make comparative assessments, such as a judgment as to which of several categories seems most worthy of further exploration.

Finding Two or More Items That Fit Together Well
: Often, people are searching not for a single item but for two or more items that have to be generally compatible (e.g., two tools that are to be used together). Doing the searches in parallel can be an effective way of ensuring that the compatibility constraint is met.

Creating a Useful Structure for Future Reference or Further Exploration
: The type of structure shown in Figure 1 can serve both as a useful structured overview of subsets of items in a domain and as a basis for further exploration at a later time. Such a structure can also be created for another person as a way of preorganizing a set of items for them.

Supporting Collaborative Exploration
: Although the benefits just mentioned can be enjoyed by a single user, parallel faceted browsing also enables synchronous or asynchronous collaborative exploration.

In a typical case, a user starts with a keyword search, which yields a large set of results; the user then specifies values of one or more facets in order to narrow the focus down to some subset of the entities in the repository, which are then displayed. The user can then proceed to specify values of additional facets to narrow the focus further.

The many different realizations of faceted browsing (see [6] for a comprehensive survey) have so far shared one general limitation: At any given time, the user can see the results for only one query (i.e., one set of constraints on values of facets).

Within the paradigm of *parallel faceted browsing* (recently introduced in [1]), the user can create in parallel a number of interrelated queries and see their results displayed simultaneously in a way that visualizes their relationships to each other. Formative and summative user studies (see [2]) have brought to light several general benefits of this extension, which are listed in Table 1 and illustrated in the next section.

Example Scenario

The demonstrator[1] currently serves people who are interested in events related to Helsinki's role as the 2012 World Design Capital.[2] Figure 1 shows how the screen might look in the middle of the following scenario: Alice and Bob will be visiting Helsinki in December. Alice is interested in design and intends to visit a number of World Design Capital events in Helsinki and nearby towns. Bob is more interested in music and would like to get to know the major concert venues of Helsinki.

Working from top to bottom at the same computer, Alice and Bob have first narrowed their focus to a particular range of dates, via a (popup) menu like those familiar from normal faceted browsing. Working toward the left, Alice has zoomed in on the events concerning the World Design Capital. Noticing in the popup menu that these events fall into various categories (labeled with tags), she didn't know right away which categories are of most interest to her, so she has chosen to examine the two most promising-looking ones in parallel. She has opened up views of the results for both of these categories, which she can evaluate quickly using the word clouds or more thoroughly by scrolling through the brief thumbnail descriptions. She can click on the thumbnail description of any event to see a larger description, which in turn includes a link to the full web page describing the event. The two icons in the upper right-hand corner of the more detailed description allow her to save the description in a "tray" of events that she would like to return to (like a shopping cart)—or, more temporarily, to "pin" the description to keep it visible on the display while she is exploring other events.

Meanwhile, on the right Bob has been focusing on a broader set of events that have been acquired from the event site Last.fm, zooming in on events in the two main concert venues in Helsinki. Alice and Bob can communicate as needed to ensure that the plans that they make will be compatible in terms of space and time.

At any time, Alice or Bob can create a unique URL for the current view, which they can save with a bookmark in order to be able to refer to their results later or to continue their explorations. They can also send the link by email to others or embed it in a web page or blog.

[1] `http://eventmap-ui.appspot.com`

[2] For CHI 2013, it is being populated with events in and around Paris that conference attendees might be interested in.

Table 2: Application areas for parallel faceted browsing.

E–commerce
- Shopping for products within a very large selection: considering different brands and/or types in parallel
- Shopping for a set of different products that need to be compatible (e.g., a notebook and accessories)

Personal information management
- Getting an overview of previous email correspondence
- Semiautomatically organizing photos in a collection

Research and education
- Using parallel faceted browsing as an alternative to Advanced Search in a digital library
- Semiautomatically creating organized sets of Wikipedia pages related to a given topic

Application Areas and Learnability

Since parallel faceted browsing is a generalization of normal faceted browsing, the benefits listed in Table 1 are potentially achievable in all of the application areas in which normal faceted browsing has been applied successfully. Table 2 provides some examples. Studies with more than 200 participants (see [2]) have shown that typical web users can figure out how to operate a parallel faceted browsing interface without usage instructions.

Related Work

The most closely related development in previous research is Lunzer and Hornbæk's (see [5]) concept of *subjunctive interfaces*, which "provide mechanisms for the parallel setup, viewing and control of scenarios". This concept has been realized in various domains (see, e.g., [3]) but not (to our knowledge) applied to faceted browsing.

Implementation

The demonstrator's user interface, which is implemented in the Google Web Toolkit, essentially runs in any web browser, including those on medium-sized tablets. To create the event repository for this demonstrator, we built an event collector working on RSS feeds and on the APIs of large event directories (see [4]). To enrich the data, we used Harava[3] for data harvesting, linked its RDF annotations with the EventMedia dataset of the Linked Open Data cloud,[4] and then performed several interlinking processes to discover connections between the facets and to reconcile the various information sources.

Acknowledgments

The research and development for this demonstrator were supported by the European Union's FP7 via the projects GLOCAL (GA 248984), LinkedTV (GA 287911), and ALIAS (AAL-2009-2-049); by the Finnish Funding Agency for Technology and Innovation (Tekes) via the projects SUBI and FinnONTO; and by the EIT ITC Labs via the activity EventMAP (TFMC 12116). Contributions to the interaction design were made by New Grit, Berlin (www.new-grit.com) and by students in the 2012 course on User Interface Design at Saarland University.

[3] `http://www.seco.tkk.fi/tools/harava`
[4] `http://linkeddata.org`

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