Towards Social Information Seeking and Interaction on the Web

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Abstract

User generated content is one of the key concepts of the social web (a. k. a "Web 2.0") and enables users to search and interact with information that has been created (e.g. blogs) or annotated by other users (e.g. in tagging systems). Consequently, information seeking and interaction have been extended by a social dimension. The interaction can be social in so far that user generated content is searched and retrieved or, in a more direct manner that social interactions are carried out before, during or after search by communicating through Web 2.0 features like (micro-)blog posts, comments, and ratings. This paper focuses on social interactions during the search process by combining a model introduced by Shneiderman (2002) which attempts to describe human motivation for collaboratively using computers with an explorative model for social search by Evans and Chi (2008).

1   Modelling Social Interactions and Applications

Shneiderman, focussing on the qualities of computers as tools rather than intelligent entities in the tradition of Landauer (1996), argues that models of human needs and an understanding of these needs is crucial for designing successful and useful software: "The old computing is about what computers can do; the new computing is about what people can do" (Shneiderman, 2002, p. 2). Among these needs are social needs that represent emotional relationships with people from one's own family, friends or colleagues.

While this first dimension of Shneiderman's framework attempts to describe with whom people interact to satisfy their needs, the second dimension describes the creative activities human computer interaction is composed of: *collecting*, *relating*, *creating* and *donating*. The first stage of activity is composed of collecting information. Subsequently, the *relate* activity occurs in which humans discuss things with peers, mentors, friends or family. Finally, the *donate* activity covers publishing *created* artefacts. Donation also includes the dissemination of creative products. Publishing a collection of art photographs on *Flickr* is a typical example of donation in the context of the Web 2.0. This approach can be compared with approaches to modelling information behaviour represented, e.g., in the faceted model of information interaction proposed by Cool & Belkin (2002) which lacks the social dimension but offers a more fine-grained process model for "information behaviors" (Cool & Belkin, 2002, p. 11, Huvila & Widén-Wulff 2006).

Shneiderman attempts to build an integrative framework of activities and relationships into which all human computer interaction can be classified. *Process stages* and *social context* are the primary criteria for setting up "activities and relationship tables" (ARTs, Shneiderman 2002, pp. 87) which can be used for organizing interaction concepts and possible systems. While published before the advent of Web 2.0-based social software, it is quite obvious that ARTs can be used to analyse current social activities on the web as well as the social software landscape (see Table 1 below). The many forms of user generated content on the Web 2.0 open up a communication space to all participating users and enable social search where users directly or indirectly interact with other users throughout the search process. In the following chapter we will discuss aspects of social search in more detail.

2   Search and Interactions on the Social Web

Social search as a Web 2.0-related phenomenon has found differing interpretations: Goh & Foo (2008) focus on *indirect* social interactions by harnessing the content generated or annotated by other users. It is obvious that in addition to indirect social relations as observed by Goh & Foo (2008), *direct* and *explicit* social interactions can be part of the search process.

Several search models have stressed the iterative nature of information retrieval (among many others: Ford 2005, Salton & McGill 1983:237).

Table 1 – Information and Communication-related Activities and Relationships

	Collect Information	Relate Communications	Create Innovation	Donate Dissemination
Self	Retrieve an item from the personal collection in *Flickr, Connotea, Delicious*, etc.		Manage personal *Delicious* bookmarks; Manage scientific bibliographies on *Connotea*;	
Family and Friends	Browse a friend's collection of *Flickr* photos;	Communicate with friends on *Facebook;* create a social networking profile that reflects your personal beliefs and tastes;	Tag photos for retrieval on *Flickr*; use *a blog* to write about experiences during a year abroad;	Publish birthday photos on *Flickr*;
Colleagues	Sift through the bibliography of fellow researchers on *Connotea* or *Citeulike*;	Write a message to a fellow colleague on *Facebook*;		Use a bookmarking management software to publish job-related articles; Write about business processes in the *CorporateWiki*;
Citizens and Markets	Watch *Youtube* videos;	Rate videos on *YouTube*; Express an opinion about product on *Amazon*;	Compose a Wikipedia article; comment on articles from newspaper portals; Write a blog about public issues;	Publish a *Wikipedia* article; Share a *Youtube* video;

However, the role of social interactions in the search process does not play an important role in these models. Evans & Chi (2008) study such interactions and explicitly incorporate them in their social search model. Like Shneiderman they stress the human need for social interactions. Basically, they differentiate between interactions before, during and after search and claim that social interactions before searching help users to make their information need (more) concrete. Especially during informational searches (for a classification of web based search types, see Broder, 2002), "users may talk to others for advice, feedback, and brainstorming to improve their search schema and keyword selections" (Evans & Chi 2008, p. 4). And after search, users communicate with other users to collect feedback on their results or to share the knowledge they have discovered with others.

Figure 1 presents a mapping of the social interactions postulated by Shneiderman to the respective search phases. Shneiderman's collect activity

is used as a pre-search activity before the actual search and also represents the retrieval phase as a whole. Figure 1 also shows that the Web 2.0 is the enabling technology for users to communicate information with citizens and markets on a large scale since potentially the whole Web is the audience for user generated content (e.g. blogging, commenting, announcements on a social networking application). Relating to colleagues during search represents an information exchange during the search phase by e.g. contacting other users within a social bookmarking system.
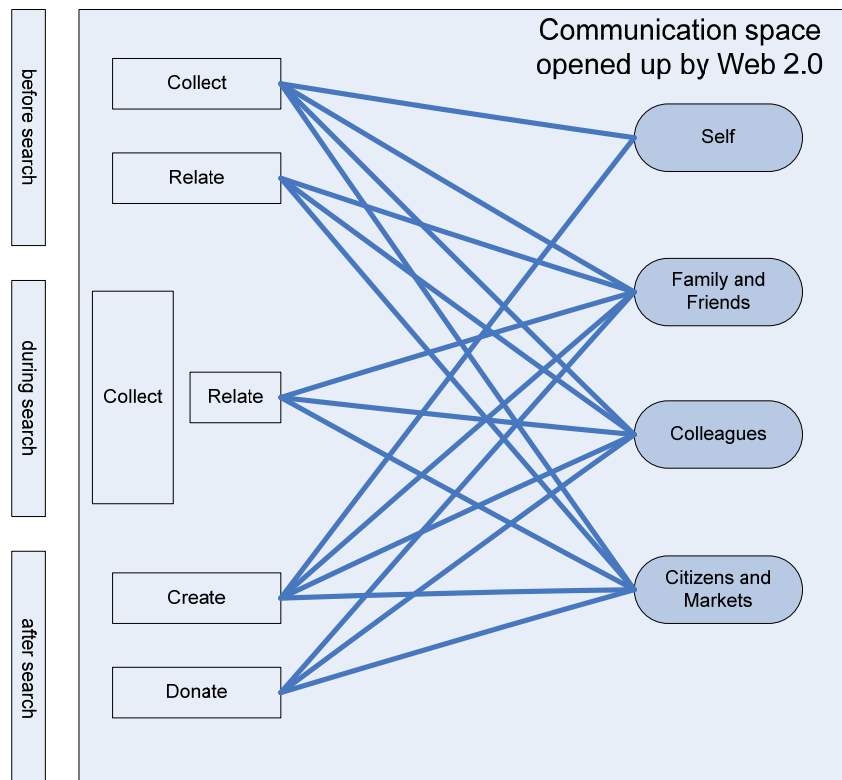
Figure 1 - Social Interactions during search

In the tradition of information retrieval, social interaction as part of the search process has more recently been replaced by the predominant model of end user search (Glöckner-Rist 1993, Wolff 2006): With the exception of some fields of search as in large research-directed companies (patent research, life sciences) who employ professional information researchers,

search has been established as a typical end-user task. We argue that the Web 2.0 offers communication tools which can be adapted by future IR systems modelling such search-related communication on the web. Thus a stronger social aspect of search may be re-established.

3   Conclusion

This paper emphasizes the importance of social interactions in information retrieval and aligns these interactions with typical phases of information seeking. Incorporating the notion of social search into the design of Web 2.0-based IR systems might offer valuable support for information seeking users.

It remains an open question how future search interfaces can support users in their search tasks and whether and how features for social interactions during search can be incorporated in web search tools. While cooperative information management flourishes (e.g. *Connotea*, *CiteULike*, *EndNote Web*, *Aigaion*), these systems mainly concentrate on the *after search* stage of information retrieval since they enable users to share their retrieved items with other users. However, these systems also introduce social interactions during serendipitous search tasks, when viewing other users' bibliographies is considered as a more indirect form of social interaction. At the same time, there is a broad range of possible communication types in the *before* search stage that might be supported by cooperative systems, e.g. keyword suggestions, explicit literature recommendations, query syntax review and help or offering (relevance) feedback on search results. It might also be argued that certain applications support users by enabling them to communicate with others before and during search – systems like Yahoo Answers (http://answers.yahoo.com/), expert recommendation platforms (http://en.allexperts.com/) or commercial task platforms like *Mechanical Turk* (https://www.mturk.com/) offer information-related communication services. Institutionally, such services for search communication could be integrated in library information systems (e. g. OPACs or database interfaces, cf. Wolff 2008). All these applications are recent phenomena and allow IR system designers to develop a different understanding of how social search can be implemented by using the web as a means of communications and might inspire the design of future social search systems.

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