

Research Statement

For many of us the pervasive access to information has enabled us to do complex, information intense tasks ourselves that earlier we relied on other experts to do for us. Vacation planning and health information gathering are two examples. However this opportunity to take charge of our information tasks has also come with a glut of information which makes these information intense tasks complex and extremely difficult. Web 2.0 and other information and communication technologies (ICTs) offer us a chance to support each other in such complex information tasks. ICTs provide us with the opportunity to work with others in a range of engagement from active collaboration, to getting advice, to reusing the work done by others before us. However, there is a need to better understand how people collaborate in these complex tasks as well as what new opportunities ICTs can offer. My research work so far including my dissertation work and my future research plans focus on understanding and supporting collaboration in complex information intensive tasks. This research has drawn upon multiple disciplines and research methods in order to illuminate current practices and identify opportunities for the design of future tools.

Dissertation Research

The framework of sensemaking has been applied by many disciplines to study and support complex, information intense tasks like the ones mentioned above. Sensemaking can be done collaboratively in various modes like active synchronous collaboration and sequential handoffs. My dissertation, *Sensemaking Handoffs: Why? How? and When?* under the direction of George Furnas in conjunction with Judy Olson, Michael Cohen, Karl Weick and Daniel Russell explores the challenges of sensemaking handoffs and opportunities of supporting it. Handoffs are a form of serial-asynchronous collaboration where a provider transfers their work to a recipient. In sensemaking situations handoffs can occur by choice and also due to events like shift-change. While handoffs are often a desirable mode of collaboration they can be difficult and therefore need to be examined closely.

Since there are many definitions and conceptions of sensemaking, I began my dissertation by outlining what I consider to be the essential attributes of sensemaking. These attributes were developed drawing from sensemaking theories from human-computer interaction, social psychology and information science as well as prototypical scenarios like the 1999 diagnosis of West Nile Virus outbreak in Queens, NY. Besides building a theoretical understanding of sensemaking, these attributes can also guide the choice and modification of tasks for studying sensemaking in the lab and in the field.

The first study in the dissertation began by exploring why people choose to handoff sensemaking tasks, when people hand-off and what their handoff practices are under these conditions. To do this, I conducted a qualitative field study comprising semi-structured interviews of computer support helpdesks. The findings from this work was published in *Proceedings of the 71st ASIS&T Annual Meeting*, "Sensemaking Handoff: When & How" (2008). One important finding of the study was that sensemaking handoffs can be successful especially when common-ground, intent to collaborate, shared physical space and additional communication are present. This finding presents many opportunities as well as constraints for the design of handoff procedures and support systems.

Next, I wanted to examine how much sensemaking handoff was possible with only handoff artifacts and without any other collaborative support. If sensemaking artifacts alone from earlier sensemakers are useful then the sensemaking burden of people can perhaps be eased by enabling the sharing of prior sensemaking work from strangers through the use of ICTs. I conducted two laboratory studies using an online product choice task which allowed better control of the tasks and the nature of the hand-off collaboration than in the earlier field study. In the first lab-study performance of participants receiving handoffs was compared to those in synchronous collaboration as well as those working alone without any handoffs. The results showed that both synchronous collaboration and the use of handoff material prepared by others resulted in reliably better performance. This result is promising for the design of ICT tools that enable sharing and utilization of completed sensemaking with others who have worked on the same task. In the second study I conducted a microanalysis of how high and low quality sensemaking handoff materials are used by recipients. The results from this second lab study suggested that the usage of handoff material indeed seemed to differ depending on the quality. High-quality material was seemingly used earlier compared to low-quality material, possibly because high-quality material provided ideas to organize the information while the low-quality material just provided pieces of information.

The fourth study in my dissertation is now in progress and will be complete by the summer of 2009. It is a lab experiment designed to explore quantitatively the relative value of early vs. late handoffs. I am also exploring qualitatively the material created at the early vs. late handoff times, and how that material is used by recipients. It is predicted that the experiment will find that early handoffs enable the transfer of sensemaking more poorly than late ones, and that such benefit that there is will be disproportionately low in case of early handoffs while taking into account the time spent by the provider. The findings from the current study in conjunction with other studies already conducted are expected to provide useful implications for sensemaking handoff practice and system design. If it is found that only late work is useful, sensemakers would benefit from refraining from handoffs until late. If it is found that even early artifacts are useful as only pieces of information, future support tools can make that specific value available to others.

My dissertation research work so far highlights efficient work practices and offers opportunities for the design of tools to help people handoff complex information intense tasks like sensemaking. After graduation I intend to continue exploring the various aspects of sensemaking handoffs unearthed so far. The effects of the intent to collaborate, shared space, awareness and additional communication each need to be examined in detail. My dissertation research will also put me in an excellent position to explore specific domains like healthcare where sensemaking handoffs are frequent and of critical importance.

Other Research

Besides my dissertation research I have been engaged in other diverse research projects. The common aspects of all these projects have been their goal to help people with real-world information intensive problems through collaboration as well as their multidisciplinary nature. My prior experience as an architect convinced me of the importance of research in supporting everyday practices of professionals. Designing is another complex task that needs to take into account many facts and constraints. While my experience as a professional

designer provided me with insights into complex information-intensive tasks, I also realized the importance of drawing on and working with people from multiple disciplines. My graduate education at the School of Information at University of Michigan has given me opportunities to engage in multidisciplinary research and has further strengthened my confidence in this approach.

In one such project I, along with Silvia Knobloch, Derek Hansen and Scott Alter investigated the impact of popularity indicators on the readers' choice of online news articles. Popularity indicators have the ability to modify the information seeking behavior of information users. To investigate how indicators affect information choices, 93 participants browsed online news that featured explicit (average rating) or implicit (times viewed) indicators or no indicators (control group) while news exposure was logged. Participants picked more articles if the portal featured explicit indicators (ratings), and higher ratings instigated longer exposure to associated articles. Implicit indicators (times viewed) produced a curvilinear effect so people looked longer at articles that were indicated as been seen by either very many or very few people. This research provides insights into the selection of information by users as well as informs the design of news portals. This research "Impact of popularity indications on readers' selective exposure to online news" was published in the *Journal of Broadcasting & Electronic Media*.

Another multidisciplinary project, with Jahna Otterbacher and Tapan Khopkar, involved the use of natural language processing to help online shoppers. Web 2.0 has allowed online shoppers to become not just information seekers but also information providers. Many e-commerce venues allow users to share their experiences in the form of textual product reviews. While textual product reviews represent a wealth of information for candidate buyers, finding pertinent information becomes difficult, as the number of reviews for a particular product becomes large, or if the buyer is interested in particular features of an item. We designed ChatterCrop, a tool that uses text summarization to help with these problems. ChatterCrop condenses the information from a large set of reviews into a few sentences, and allows users to customize these summaries based on the features of their choice. In a user study, subjects used ChatterCrop and a sortable list of reviews, to answer questions about two camcorder models. When looking for information about particular features, ChatterCrop outperformed the list, in terms user confidence and perceived ease in finding pertinent information. ChatterCrop also provided users with starting points to guide further research, and was particularly helpful in the early stages of search. This research was published in the *Proceedings of the 70th ASIS&T Annual Meeting*, "ChatterCrop: Reaping the Benefits of Online Product Reviews" (2008).

My past research has tried to help people engaged in complex information intensive tasks through opportunities presented by collaboration. This has required a multi-disciplinary approach to my research. I anticipate that the specific research questions I explore will change over time. However, the questions I explore will always be guided by my commitment to helping people with information intensive tasks through multi-disciplinary research.