Chapter 9
Designs for Systems to Support Collaborative Information Behavior

Chirag Shah
Rutgers, The State University of New Jersey, USA

ABSTRACT
Designing systems that support collaborative information behavior (CIB) pose many unique challenges that single-user systems typically do not face. This chapter attempts to take the reader through a variety of notions, design principles, and instantiations of CIB systems. Requirements and guidelines for a good CIB system are provided based on various research studies and projects done in different domains. It is pointed out that in the information seeking field, control, communication, and awareness are some of the most critical aspects of a CIB system that caters to multi-user and multi-session collaborative projects. Several actual implementations of CIB systems are described, and suggestions for designing a successful CIB system are presented.

INTRODUCTION
There are several reasons for humans to work together. For one, sometimes a problem is just too complex for a single individual to tackle. Denning & Yaholkovsky (2008) regard such problems as “messy” or “wicked” and argue that collaboration is essential for resolving such messes. When it comes to accessing or processing some information, it seems that in many situations, multiple people working together will be able to do a better job than any one of them individually, given that they have appropriate tools. For instance, Olson et al. (1993) developed ShrEdit, a shared text editor. To their surprise, they discovered that the groups working with ShrEdit generated fewer design ideas, but apparently better ones. They believed their tool helped the supported groups keep more focused on the core issues in the emerging design, to waste less time on less important topics, and to capture what was said as they went.

Despite the importance of collaboration in many situations, there is a lack of support for people working to collaborate on information
seeking. Morris (2008) showed from a survey of 204 knowledge workers that the majority of them wanted to collaborate, but often found it difficult due to the lack of specialized tools to support their natural behavior for working in collaboration. Twidale & Nichols (1996) pointed out that “The use of library resources is often stereotyped as a solitary activity, with hardly any mention in the substantial library science and information retrieval literature of the social aspects of information systems.” They argued that introducing support for collaboration into information retrieval systems would help users to learn and use the systems more effectively. In general, for solving complex problems, inducing better learning, and catering to the social aspect of information seeking, a new paradigm of systems design is needed that goes beyond supporting individual activities in information seeking. The present chapter aims to provide an overview of such design practices and implementations to support collaborative information behavior (CIB).

The rest of the chapter is organized as follows. The exploration of the CIB design paradigm begins with a review of some of the definitions, challenges, and design principles reported in the literature. This background section will take the reader from various concepts and theories about CIB system designs to their practical instantiations. This review is followed by detailed descriptions of three systems that support CIB. Pointers to future research directions are then provided, and the chapter concludes with some remarks on the lessons learned from past and current CIB systems designs, and the implications for designers and researchers in this field.

**BACKGROUND**

In this section, the reader will be introduced to a number of definitions, concepts, and principles for designing and developing systems that support CIB. A good design follows a thorough understanding of user needs, requirements of the problems, and carefully derived principles. An insight into these aspects will be provided through a number of studies reported in the literature.

**Definitions and Terminology**

Let us begin by looking at the concept of collaboration. As its Latin roots ‘com’ and ‘laborate’ suggest collaboration indicates “to work together”. London (1995) interpreted this meaning as working together synergistically. Gray (1989) defined collaboration as “a process of joint decision-making among key stakeholders of a problem domain about the future of that domain.” Roberts & Bradley (1991) called collaboration “an interactive process having a shared transmutational purpose.” What all these definitions inform us is that collaboration is an active, interactive, and usually a mutually beneficial process. It is often used interchangeably with coordination and cooperation. However, for the purpose of our discussion here, we need to clarify the distinction among these seemingly similar terms. Austin & Baldwin (1991, p.4) noted that while there are obvious similarities between cooperation and collaboration, the former involves pre-established interests, while the latter involves collectively defined goals. Malone (1988) defined coordination as “the additional information processing performed when multiple, connected actors pursue goals that a single actor pursuing the same goals would not perform.” Note that this definition of coordination says nothing about working or creating solutions together, thus distinguishing it from collaboration. Denning & Yaholkovsky (2008) suggested that coordination and cooperation are weaker forms of working together, while collaboration indicates a stronger, more focused tie among the participants. Similarly, Chrislip & Larson (1994, p.5) defined collaboration as “…a mutually beneficial relationship between two or more parties [agents] who work toward common goals by sharing responsibility, authority, and accountability for achieving results.”
Related Content

Web 2.0 Technologies and Authentic Public Participation: Engaging Citizens in Decision Making Processes
[www.igi-global.com/chapter/web-20-technologies-and-authentic-public-participation/107758?camid=4v1a](www.igi-global.com/chapter/web-20-technologies-and-authentic-public-participation/107758?camid=4v1a)

The Children’s Digital Media Center @ Los Angeles
Kaveri Subrahmanyam and Adriana Manago (2012). *Encyclopedia of Cyber Behavior* (pp. 64-76).
[www.igi-global.com/chapter/children-digital-media-center-los/64742?camid=4v1a](www.igi-global.com/chapter/children-digital-media-center-los/64742?camid=4v1a)

Analysis of Tweets Related to Cyberbullying: Exploring Information Diffusion and Advice Available for Cyberbullying Victims
[www.igi-global.com/article/analysis-of-tweets-related-to-cyberbullying/145792?camid=4v1a](www.igi-global.com/article/analysis-of-tweets-related-to-cyberbullying/145792?camid=4v1a)

Constructivist and Constructionist Approaches to Graduate Teaching in Second Life: Ethical Considerations and Legal Implications
[www.igi-global.com/article/constructivist-constructionist-approaches-graduate-teaching/52099?camid=4v1a](www.igi-global.com/article/constructivist-constructionist-approaches-graduate-teaching/52099?camid=4v1a)