A cross-domain analysis of task and genre effects on perceptions of usefulness

Luanne Freund *

University of British Columbia, Vancouver, Canada

ABSTRACT

Search systems are limited by their inability to distinguish between information that is on topic and information that is useful, i.e. suitable and applicable to the tasks at hand. This paper presents the results of two studies that examine a possible approach to identifying more useful documents through the relationships between searchers' tasks and the document genres in the collection. A questionnaire and an experimental user study conducted in two domains, provide evidence that perceptions of usefulness are dependent upon information task type, document genre, and the relationship between these two factors. Expertise is also found to have an effect on usefulness. These results further our understanding of the role of task and genre interactive information retrieval.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

The relationship between searchers' information needs and documents in the collection is at the heart of information retrieval (IR). Although topical relevance has been the primary basis for matching needs to documents, the importance of situational and task-based criteria, which influence the usefulness of documents in particular contexts and situations, have long been acknowledged (Borlund, 2003a; Cooper, 1971). These criteria are fundamental to conceptions of Interactive IR (Ruthven, 2008) and Human Computer Information Retrieval (HCIR) (Marchionini, 2006). This paper contributes to our understanding of situational criteria by focusing on the pragmatic relationship between two factors: document genres and searchers' information tasks. Genres are recognizable types of information objects differentiated through aspects of form, content and communicative function. They are naturally-occurring features of written communication and are prevalent in most large document collections. Reports, guides and newsletters are examples of common document genres. Information tasks are activities focused on finding information to serve particular purposes. This research focuses on a set of generic information task types: learning, fact-finding, doing, making a decision, and solving a problem. Two studies in different domains that examine the effect of variations in task type and document genre on the perceived usefulness of documents are presented and compared.

This research topic is important because search systems still do a poor job of identifying information that is useful, i.e. capable of supporting the tasks and goals of searchers. In most search systems, the searcher is required to manually sift through large sets of results that are "about" the query, in order to find those that are appropriate to their needs. While considerable research attention has been directed at improving interaction paradigms and the display of search results to support searchers in the assessment and selection process, there is still a need for robust, task-based models to predict document usefulness. The task–genre relationship is potentially valuable in this respect, because it has both common-sense validity and a logical basis in functional genre theory. However, more empirical research is needed to

* Tel.: +1 604 822 0825; fax: +1 604 822 6006.
  E-mail address: luanne.freund@ubc.ca

determine the nature and extent of the task–genre relationship as it pertains to information retrieval. A number of studies have shown that document selection in the search process is influenced by genre (Freund, 2011; Freund & Berzowska, 2010; Roussinov et al., 2001) and by task (Freund & Berzowska, 2010; Kelly, 2006; Larsen, Malik, & Tombros, 2008; Tombros, Ruthven, & Jose, 2005), but very little work has looked at the trilateral relationship between task, genre and usefulness.

One of the challenging aspects of this approach is that task and genre repertoires vary across domains and information environments. Much of the foundational work studying genres of communication has been done in organizational settings, which tend to have relatively well-defined and cohesive communities and information practices (Orlikowski & Yates, 1994). More recently, genre research has extended to the Internet (Rosso, 2008; Roussinov et al., 2001; Stein, Meyer zu Eissen, & Lipka, 2011) where the communities of users are more widely scattered and differentiated. Therefore, one of the goals of this paper is to determine the extent to which patterns of task–genre relationships are domain specific or generalizable across domains. Clearer articulation of these boundaries will facilitate the development and application of robust theory and methods in the design of search systems.

This paper synthesizes and builds upon previous work by the author (Freund & Berzowska, 2010; Freund, Toms, & Clarke, 2005) by focusing specifically on the task–genre-usefulness relationship across two domains. The first study reported here was conducted in an enterprise setting via a questionnaire with a population of software services consultants. The second study is an experimental user study focused on e-government content: an Internet domain that shares some features of the enterprise but is used by a much broader community. The paper is structured as follows. The introduction is followed by a background section containing a description of the conceptual framework for this work and a review of prior research. The methods and results of each of the two studies are presented separately, followed by a common discussion and some brief conclusions.

2. Background

2.1. Conceptual framework

The general conceptual framework for this work is contextual IR, an ecological approach that seeks to identify the nature and impact of the many factors that influence the IR interaction. Calls for contextual IR have been put forward by Sparck-Jones (2006) and Ingwersen and Järvelin (2005) among others. The intent of contextual IR is to develop models of context that can be employed in IR systems to enhance retrieval performance. The two contextual factors examined in this paper are information tasks and document genres.

2.1.1. Tasks in HCIR

A task can be described as "an activity to be performed in order to accomplish a goal" (Vakkari, 2003). Human activities in the workplace and in everyday life are often, although not always, goal directed, and it is widely recognized that such activities often prompt information seeking behavior. Proposals to re-conceptualize IR as a task-based activity have been made by Vakkari (2003) and others (e.g. Järvelin, 1986; Reid, 2000). With respect to HCIR, which brings together perspectives from Human Computer Interaction (HCI), Information Behavior (IB) and IR, it is useful to consider tasks at a number of levels, including: work tasks, information tasks, search tasks, and system interaction tasks. A number of useful reviews discuss these task hierarchies and typologies in more detail (Byström & Hansen, 2005; Toms, 2011; Vakkari, 2003).

Work tasks are particular cases of tasks, in which there is an assigned activity or unit of work that needs to be completed in order to meet a pre-defined goal, usually having some extrinsic value. The work task provides the "embedding task" (Hansen, 2005; Pirolli, 2007): the environment in which search tasks are conducted and which establishes the criteria for evaluating outcomes, including relevance assessments (Borlund, 2003b). Work tasks have been analyzed from multiple perspectives and at varying levels of granularity, and a large number of characteristics and features have been identified that may be associated with information behavior (Hert & Marchionini, 1997; Kim & Soergel, 2005; Li, 2009). Among these, some of the most commonly studied characteristics are complexity and stage. Much of this work has been reviewed extensively elsewhere (Toms, 2011; Vakkari, 2003).

The primary focus of this paper is at the level of information tasks, which are less commonly differentiated from work and search tasks. There is no agreed-upon nomenclature or typology of information tasks. Allen's (1996) book entitled *Information Tasks* refers to cognitive activities that take place in the course of interacting with information: scanning, evaluating, learning and planning. Other common types of information tasks (often referred to as search tasks) used in studies of search behavior are based upon the type of information sought: known item searches, subject or topical searches, fact finding, and question–answering (Hsieh-Yee, 2001). In this research, information task types are defined based on the user's intended use of the information, which is similar to Taylor's (1991) typology of information uses. The five types are: learning, fact-finding, doing, making a decision, and solving a problem. While these tasks may prompt searching, in all but the case of fact-finding they cannot be resolved simply by finding information, and thus they are distinct from search tasks. Information tasks are motivated and framed by work tasks.