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**KNOWLEDGE FLOW IN ONLINE COMMUNITIES:
A STUDY OF THE RELATIONSHIP BETWEEN
KNOWLEDGE COMPLEXITY,
ONLINE COLLABORATION,
AND KNOWLEDGE FLOW**

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ABSTRACT: Prior research establishes useful theory on knowledge flow, knowledge complexity, and collaboration in organizations. However, blogs, wikis, and discussion forums support collaboration and knowledge flow in a new realm, distributed work settings, where participants rarely if ever enjoy face-to-face contact. This research will investigate the unique features of online communities that facilitate knowledge flow. Specifically, we will look at the interaction of knowledge complexity and collaboration in knowledge flow in online communities and help provide guidance for researchers in designing online communities for more efficient knowledge transfer.

KEYWORDS: knowledge flow, knowledge complexity, collaboration, online communities

INTRODUCTION

Knowledge-based organizations have an interest in improving knowledge flow to preserve organizational knowledge, improve knowledge-worker productivity, and maintain competitive advantage. Toward this end, businesses and other organizations are adopting online communities—blogs, wikis, and discussion forums—to promote collaboration and sharing of information among employees, business partners, and customers (Jackson et al., 2007; Voelpel et al., 2005; Weinberger, 2005).

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THEORETICAL FOUNDATIONS

While there are interesting epistemological debates over the nature of knowledge (Alavi & Leidner, 2001), we adopt a practical definition: "*Knowledge is the capacity to act*" (Anjewierden et al., 2005). This definition captures what organizations value about knowledge: the ability to perform, to produce goods, to provide services, to respond to market forces, to improve business practices, and to sustain and expand competitive advantage. Knowledge flow, the movement of knowledge among and within organizations, has drawn much scholarly attention, as researchers try to identify the features of knowledge and organizations that promote effective knowledge flow (Appleyard, 1996; Gupta & Govindarajan, 2000; Hansen, 1999; Hu & Jaffe, 2003).

Simple knowledge is "highly codified and independent;" complex knowledge is "highly non-codified and dependent" (Hansen, 1999). This dichotomy aligns closely with the explicit–tacit dichotomy (Droege & Hoebler, 2003): explicit, recordable knowledge is generally simpler, while tacit knowledge is inherently more complicated and is "hard to articulate" (Hansen, 1999).

Complex knowledge moves more slowly through social networks (Hansen, 1999). De Meyer (1991) found the difficulty of transferring complex knowledge even more pronounced in early forms of electronic communication—fax machines, e-mail, teleconferencing, and video conferencing. While electronic communication in principle may present inherent difficulties to the transfer of complex knowledge, online community technologies are becoming much more familiar not only in the workplace but in home computing, presenting the as-yet insufficiently studied ability of users of wikis, blogs, and discussion forums to develop strategies to convey increasingly complex knowledge in their online communities.

Collaboration, the "mutual engagement of participants in a coordinated effort to solve [a] problem together" (Roschelle & Teasley, 1995, p. 70), creates social capital that enhances knowledge flow: "The location of an actor's contacts in a social structure of interactions provides certain advantages for the actor. People can use their personal contacts to get jobs, to obtain information, or to access specific resources" (Tsai & Ghoshal, 1998).

Research on social networks (Granovetter, 1973; Hansen, 1999) finds that collaboration builds strong collaborative ties that have greater capacity for the flow of increasingly complex knowledge. Online communities face disadvantages in conveying knowledge beyond the written word (Snowden, 2003), due to the absence of such features as "sensory information, feelings, intuition, and context" (De Meyer, 1991) and the trust created by co-presence and co-location (Robert, 2000). Nonetheless, social presence research suggests that users of computer-mediated communications can devise compensatory strategies to support knowledge flow (Gunawardena, 1995; Tu & McIsaac, 2002). Research has found wikis may improve knowledge flow in organizations (Cho et al., 2006; Raman, 2006). Blogs can elicit a "passion for voluntary knowledge work" (Kaiser et al., 2007) and "support both cognitive and social knowledge construction" (Du & Wagner, 2007). Blogs can make knowledge flow much faster and more widely than traditional means (Barwick & Back, 2007). Organizations including emergency health care practitioners (Curran & Abidi, 2007), Siemens AG (Voelpel et al., 2005), and the BBC (Weinberger, 2005) have

exploited discussion forums to improve knowledge flow.

RESEARCH MODEL AND PROPOSED METHODOLOGY

While research and experience demonstrate the capacity of online communities to help knowledge flow, the need remains for research that (1) identifies specific collaborative features and activities in wiki, blog, and forum communities that enhance or mitigate knowledge flow, and (2) measures the complexity of knowledge that can flow in those communities. Such research is necessary to guide improved online community design.

Existing research and practical experience suggest the following hypotheses:

- H1. Increasing complexity of knowledge inhibits knowledge flow in online communities.
- H2. Increased collaboration enhances knowledge flow in online communities.
- H3. Increased collaboration enhances the flow of complex knowledge in online communities.

In order to test the above hypotheses, we intend to analyze textual data from online communities hosted by leading IT companies such as Sun Microsystems, Microsoft, and IBM. We will begin with blogs, wikis, and forums from the information systems discipline, as these online communities share a topical focus and offer richly developed communities of motivated and thus prolific users.

We will measure knowledge complexity by linguistic analysis (Arguello et al., 2006), various readability indices (Harrison, 1980; McCallum & Peterson, 1982) and expert analysis. We quantify knowledge flow through link structure (Flake et al., 2001) and other indications of reference to senders of earlier communications (Anjewierden et al., 2005). We access collaboration through measures of contributors and their level of participation in each specific online community. Table 1 summarizes these constructs and proposed operational definitions.

Feature	Online Communities	Operational Definitions
knowledge complexity	blogs, forums, wikis	readability indices: <ul style="list-style-type: none"> • Dale-Chall (with customized familiar word list to reflect IT domain) • Flesch Reading Ease
		linguistic features: <ul style="list-style-type: none"> • message length • word choice
		expert analysis
knowledge flow	blogs, forums, wikis	links to other online community homepages in sidebars, blogrolls, or page regions other than content
		links to other online community posts in RSS feeds
		links to other online community posts in main content
		textual evidence in comments, responses, posts/pages, etc. (e.g. "Jan posted some useful info on the forum yesterday about...")
collaboration	blogs	number of contributors
		relative frequency of contributions by users
	forums	number of participants submitting questions
		number of participants submitting answers
	wikis	number of pages created
		number of active contributors
		number of revisions per page
		relative size of revisions per page
		amount of discussion per page (number of participants and amount of text)

Table 1: Constructs and Operational Definitions

We will also explore the relative levels of knowledge complexity, knowledge flow, and collaboration exhibited by each community. This information will guide our investigation of the unique design features of blogs, wikis, and forums that may be responsible for higher knowledge management value.

CONCLUSIONS AND FUTURE WORK

This study builds on previous work in knowledge flow, social networks, and online communities to examine three hypotheses relating to knowledge flow in online communities. We expect the results of this study to inform the creation of blogs, wikis, and forums that improve knowledge flow among members of businesses and other organizations.

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