Virtue–Nets

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INTRODUCTION

David Skyrme (1999) has observed that knowledge workers exploit knowledge generated from business activities and turn it into business opportunities. Technical infrastructures enable knowledge workers and improve knowledge processes (Von Krogh, Ichijo, & Nonaka, 2000). Improving knowledge awareness requires creating a dynamic and generative environment for organizational workers (Senge, 1990). Organizations are faced with developing communication strategies that maintain centralized and fully accessible knowledge bases while at the same time trying to compete in a highly decentralized marketplace. Technological solutions for enabling and enhancing communication among knowledge workers are used for activities such as scheduling, negotiating, checking e-mail, revising documents, making reservations, connecting laptops remotely to the Net, problem solving, and decision making. There are numerous electronic devices for communicating between knowledge workers. These networked devices serve the purpose of connecting human-knowledge capital. For many companies, human-knowledge capital is a significant source of competitive advantage, and the dispersion of this capital without effective communication networks can greatly hinder the decision makers and the overall corporate decision-making process. One place to start examining the practices of knowledge workers is to study the networks in which they work.

This article explores knowledge networks and their advantage in grouping data based on qualitative attributes to support knowledge work. Such networks support and enable individual interactions with knowledge systems to enrich understanding. The next section provides a survey of communication technologies and theories to support the need to develop a network infrastructure to enable intelligent business practices. The next section on knowledge sharing proposes a virtue-net network architecture to support network connectivity using qualitative measures as a method for leveraging knowledge networks. The article concludes with a brief discussion and ideas for future research in this area. A glossary of terms for the virtue net is provided as an appendix to the article.

BACKGROUND

Knowledge management (KM) was popularized in the 1990s at a time when the dominant organizational metaphor was "organizations as computers" (Nonaka & Takeuchi, 1995). Knowledge management can be defined as "the process of identifying, capturing, and leveraging knowledge to help the company compete" (O'Dell & Grayson, 1998). Knowledge is key to organizations learning from and about customers, competitors, business partners, and staffs. Skyrme (1999) lists creating, identifying, gathering, organizing, sharing, learning, applying, exploiting, protecting, and evaluating in his representative sample of KM practices reported as key elements of knowledge-management programs.

One basic assumption of knowledge management contends that resource constraints such as time, capital, and understanding limit the ability to reasonably expect that all necessary and relevant knowledge can be captured and disseminated throughout an organization. Nonetheless, mechanisms to capture, encode, and store process knowledge in organizations provide (a) a starting point for future projects, and (b) a basis for avoiding similar mistakes in future projects. Knowing the how and why (i.e., process knowledge) behind the what (i.e., factual knowledge) leads to greater abilities to generate insight and better understanding.

Knowledge-Sharing Networks

Individuals seek information for both normative and informational reasons. Normative-influence theory suggests that human beings usually seek approval, a sense of belonging, and communality, which in some cases could account for the individual decision maker's drive for knowledge and for his or her communication with other knowledge stakeholders (Huang & Wei, 2000). Shared understanding is a relatively strong component that binds individuals in organizational and group settings. Informational-influence theory suggests the search for factual information and task truth can also act as a driver for decision makers seeking knowledge, including those seeking knowledge confirmation (Guenther & Braun, 2001).

This sort of environment requires highly efficient, responsive, and self-adaptive information systems. Ideally, the systems are designed to be able to collect and classify information automatically and keep the system updated promptly. Interconnective knowledge-sharing structures are better ways for today's companies to construct their internal knowledge-sharing mechanism. Interconnective knowledge-sharing structures establish a two-way communication pathway across the intranet. The nodes in the system include individuals as well as aggregates of individuals, such as work groups, departments, and organizations within a company.

There are numerous challenges to overcome to effectively share knowledge among organizational members. Many organizations are faced with their own sets of unique challenges. Literature in knowledge management has shown that studies on knowledge reuse need to consider both the knowledge search and transfer processes simultaneously in order to get a full understanding of how knowledge is reused within an organization (Kraemer, 1998). Locating relevant knowledge sources for reuse during problem solving incorporates two separate processes: locating relevant experts and locating relevant expert knowledge (Housel & Skopec, 2001).

Ackerman and Mandel (1995) suggest that decision makers seek expert knowledge either in the form of knowledge artifacts or connections to known experts. Thus, decision makers require access to a set of knowledge stakeholders. In turn, those stakeholders are part of other networks allowing for further access to additional knowledge resources. Among knowledge-sharing methods, personal networks are the most predominate and convenient way for people to locate relevant expertise (e.g., Faniel & Majchrzak, 2003). Unfortunately, key knowledge stakeholders or decision makers are not always readily available for consultation. Knowledge networks provide a virtual network of key knowledge stakeholders and knowledge artifacts regardless of location or time (Skyrme, 1999). The network exists in *n* dimensions enabling potential benefits through connections along knowledge pathways. This full-time access to relevant knowledge across time and space provides an environment in which knowledge seekers can gain confidence that their decisions consider the most correct and most appropriate inputs (Festinger, 1957).

Knowledge-sharing networks support and enhance communications by integrating knowledge artifacts from different sources and domains across space and time. Research in knowledge networks endeavors to achieve new levels of knowledge integration, information flow, and interactivity among people, organizations, and communities, and to deepen our understanding of the ethical, legal, and social implications of knowledge networking (Skyrme, 1999). The successful implementation of knowledge networks creates rich communication environments for sharing knowledge and reducing decision uncertainty. Knowledge networks can be used to examine the life cycle of ideas in organizations and the role and characteristics of the people who introduce and diffuse new ideas. Tracking and supporting such life cycles will allow organizations to better understand how innovation and knowledge spreads. Effective knowledge networks increase innovation and improve organizational efficiency, and they can have even greater benefits if they are structured to receive management guidance.

SUPPORTING KNOWLEDGE-SHARING NETWORKS IN ORGANIZATIONS

Beyond individual-driven knowledge-sharing methods, businesses are able to organize in-house networks to deliver value by reusing existing company knowledge. The pace of business is speeding up as customer demands become more intense, and competitors move more quickly to meet their needs. Network nodes and network bandwidth need to be improved and expanded to enable the information-carrying capacity of the network. Combining elements of business intelligence and network performance enable real-time business for activity monitoring, process value measurement, and enterprise performance indicators (Huang & Wei, 2000).

A knowledge-content view has demonstrated the importance of relatedness in the skill base, but it does not shed much light on the integrative mechanisms that would allow one business unit to obtain knowledge from another (Kraemer, 1998). Scholars have demonstrated the importance of having lateral linkages among organization subunits for effective knowledge sharing to occur. Research has shown that a subunit's information-processing capacity is enhanced by lateral interunit integration mechanisms (Keen, 1986). Tiwana (2003) has indicated that individuals began to share information, expertise, best practices, and content in a peer-to-peer network created by affinity, while businesses created organization-spanning affinity that expanded such networks, thus facilitating the exchange and sharing of know-how and tacit expertise. Advanced technology, pervasive computing power, ubiquitous wireless communications, and distributed vast storage are triggering effective business knowledge-sharing platforms based on modern networking technologies.

Jarvenpaa and Ives (1994) indicate that the sharing of knowledge requires a "highly adaptive information architecture that can provide anytime-anyplace, multimedia interconnectivity across a constantly changing network