Collaborative Knowledge Management, Social Networks, and Organizational Learning

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ABSTRACT

Organizational learning is a set of processes by which organizations improve their performance. Performance processes consist of one or more goals, outcome measures, constituent steps, and relevant people, artifacts, and knowledge. Learning processes furthermore require that the organization anticipates and attends to feedback, creates knowledge from that feedback, and takes action based on that knowledge. Relationships among people can be modeled as social networks in which network nodes represent people and network arcs represent relationships (e.g., friendship, advice, supervisor-subordinate relations) that change over time. Social networks also form a resource for collaborative knowledge management: the creation, exchange, and transformation of knowledge. Information technology offers several possibilities for making social networks and collaborative knowledge management more visible, inspectable, and systematic, which may aid the process of organizational learning.

1. INTRODUCTION

There are many definitions of organizational learning. This paper focuses on the rationalistic tradition (e.g., Winograd and Flores, 1987) which highlights the importance of feedback and adaptation, explicit goals, methods, knowledge representation, and outcomes. It is important to point out that compelling alternative formulations exist; e.g., the notion of a learning organization is not simply to engage in adaptive learning, but also to engage in "generative learning" that enhances the capacity to create the future (Senge, 1994). Nevertheless, this paper's focus on information technologies to support and facilitate organizational learning presupposes a rationalistic framing that serves as a reasonable starting point.

Therefore, for the purposes of this paper, we adopt the following definition. Organizational learning is a set of processes by which organizations improve their competence; this set of processes is inseparable from organizational performance. In other words, competent performance incorporates elements of learning. Organizational *performance* can be characterized as a set of processes where each process has one or more goals, outcome measures, constituent steps, and relevant people, artifacts, and knowledge. Organizational *learning* means that these processes also include anticipating and attending to feedback, creating knowledge from that feedback, and taking action based on that knowledge. Also, organizational learning means that an understanding of the interrelationships between processes is constantly maintained and that those relationships themselves are examined and changed as needed.

Information technologies can facilitate organizational learning by making processes, artifacts, and knowledge more explicit and sharable. Information technologies can also facilitate the creation and maintenance of social networks. Collaborative knowledge management practices and technologies, and the study of social and knowledge networks, are the topics of the next two sections.

2. COLLABORATIVE KNOWLEDGE MANAGEMENT

The primary goal of knowledge management is to "improve organizational performance by enabling individuals to capture, share, and apply their collective knowledge to make optimal decisions…in real time" (Smith and Farquhar, 2000, p. 17). Knowledge management is much more than technologies for information sharing and collaboration: it also includes the creation and sustainment of communities of practice, coping with behavioral and cultural aspects of people, and creating trusted and validated content (Smith and Farquhar, 2000).

Knowledge management and organizational learning are related. The management of knowledge includes creation and sharing of knowledge, which is a constituent of learning. However, learning also involves the decision to change future action, which is typically considered a (possible) outcome of knowledge management.

O'Dell et al. (1998) propose a particular approach to knowledge management that is based on (1) articulating a clear and appropriate "value proposition" (e.g., customer intimacy or operational excellence), (2) creating a supportive environment with the "four enablers" of culture, technology, infrastructure, and measurement, and (3) implementing a change process, typically consisting of steps such as plan, design, implement, and scale-up. Some issues in technology and culture are explored next.

Knowledge management is inherently collaborative; thus a variety of collaboration technologies can be used to support knowledge management practices. Collaborative knowledge management tools that allow people to share documents, make comments, engage in discussion, create schematic diagrams, and so on can be valuable aids to support organizational learning. An example of a collaborative knowledge management tool is LiveLink by OpenText, Inc. (http://www.opentext.com/). LiveLink includes a variety of functions such as email, newsgroups/bulletin boards, task lists, document management (check-in/check-out systems, version control), and workflow management.

There are a variety of issues with technology. To be useful, knowledge management technologies must as least provide persistence and relevant indexing strategies so that people can find information that was created in the past. Explicit process models may provide an important level of shared understanding, but may also unnecessarily rigidify the real nature of work. Furthermore, any explicit representation tends to highlight some aspects of what is represented and leave out others; in other words, all representations are political (Star, 1995).

Furthermore, the policies and ways in which collaborative knowledge management tools are used can facilitate or impede organizational learning; the use of tools changes organizational practice, and an explicit awareness of how tool use can best bring about the desired effects is critical. Indeed, the management of technology and the practices of using technological artifacts are always critical issues. For example, the most important part of LiveLink deployment to an organization is how that organization configures LiveLink for its own use. This goes beyond the mere setting of software parameters by the system administrator; it also crucially includes the development of new ways of working – new procedures and policies – that may be mandated from above by management, may grow "naturally" and haphazardly by the workers, or may be some mixture of the two.

Another issue relates to organizational culture: because learning implies that past performance needs to be improved, an organization must be willing to admit to changing circumstances, less than optimal past performance, or some level of failure. Culture is a difficult issue because it is tacit and tightly linked to the identity of individuals and the organization, although there are plenty of overt manifestations of culture such as style of dress, typical working hours, décor, jargon, myths, and so on (Harrison, 1987). Organizational culture and structure affects individual behavior in a variety of ways (O'Neill, Beavais, and Scholl, 1997) and may include a number of barriers to the appropriation of technology (Ptaszynski, 1997). For example, if technology is seen as a crutch to support incompetent people or as an unnecessary inconvenience for competent people, it will probably not be adopted. The usability of the technology also is an important issue; poor usability can easily be a barrier to widespread adoption and use of new technologies.

3. SOCIAL NETWORKS

Another way to think about the role of information technology in organizational learning is as a way to connect people together to leverage their individual intellectual capital. Social networks is a well-defined research area in organizational behavior, psychology, and communication. Social network research focuses on mathematical models of dynamic networks in which the nodes of the networks represent people and the links between them represent some kind of relationship (e.g., friendship, advice, supervisor/subordinate) (Wasserman and Faust, 1994). Each individual participates in a number of social networks simultaneously, and social networks are a critical resource in building teams and in transmitting and maintaining knowledge in an organization. Indeed, "knowledge networks" can be defined as a special case of social networks in which the links of the network represent shared or related knowledge. If social networks represent "who knows who", then knowledge networks represent "who knows what" (Contractor, 2000).

How can information technology help support and maintain social and knowledge networks? One example is the IKNOW system at the University of Illinois (http://iknow.spcomm.uiuc.edu) in which participants may join a network, enter their own data such as home page, job title, interests, etc., and then query the network database to find out who else has similar interests, complementary knowledge, etc. Notice that this system relies on individuals to input their own data, although some networks links are generated automatically by harvesting information from Web pages provided by the users. For example, if two people input their home page addresses, and both pages point to each other, that creates a link. Or if both pages point to the same third page, a link is created as well (and it is a stronger link if that third page is relatively uncommon or little-used).

Tools like IKNOW have to cope gracefully with a number of complex issues, including privacy and identity. The IKNOW solution relies on self-reporting which means that people control their own information – you do not have to indicate any or all your interests, skills, or Web pages to the system – but of course, if nobody contributed any information, IKNOW would be useless! At the same time, it is possible for users to misrepresent themselves, and furthermore, information in IKNOW may become inconvenient for certain users (e.g., what if you were the only self-designated "computer expert" in your organization?). Again, it is critical that careful thought is given to what kinds of organizational practices should evolve with new technology, and early adopters and managers can also try to model appropriate behaviors for newcomers.

4. CONCLUSIONS

In summary, information technology can support effective organizational learning by providing persistent and well-indexed tools for collaborative knowledge management and social and knowledge network analysis. However, tools are not enough: an organization needs to have some kind of systematic practice that will use the tools appropriately to monitor performance, anticipate and attend to feedback and outcome measures, design avenues for change, and then take action effectively.

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