Knowledge Management in Distributed Environments: Roles of Informal Network Players

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Abstract

In today’s globally, hyper-competitive marketplace, generation and dissipation of knowledge can no longer be understood from within the boundaries of formal organizational mechanisms. Previously, researchers have studied distributed knowledge management in global contexts based on these formal mechanisms; however, few have examined the role played by informal mechanisms. In this paper, we will examine the role played by informal networks on knowledge management and will devise propositions describing how informal roles can affect knowledge management activities.

1. Introduction

Distributed knowledge management has recently received widespread attention from practitioners and scholars [12, 13]. Because of intense competition, organizations today must be more agile in recognition and adoption of global business strategies in order to survive [2, 21]. Customers, through the use of the Internet and other ubiquitous mechanisms of computing, can access almost any product or service from virtually anywhere in the world quickly and cheaply. An organization can no longer act as a stand-alone player. It must choose to formulate strategic networks that ally customers, partners and suppliers, many of which are located in different countries and continents from the organization itself in order to survive [2, 21]. Customers, through the use of the Internet and other ubiquitous mechanisms of computing, can access almost any product or service from virtually anywhere in the world quickly and cheaply. An organization can no longer act as a stand-alone player. It must choose to formulate strategic networks that ally customers, partners and suppliers, many of which are located in different countries and continents from the organization itself in order to create supply chain networks [17]. Organizations must therefore efficiently utilize their localized pockets of knowledge, a key organizational resource in developing their capabilities to generate competitive advantages on a global level [12, 26].

Knowledge management in global environments as it has been discussed in business literature has been limited to formal organizational mechanisms. Davenport et al. [7] found eight key factors that lead to successful knowledge management programs: links to economic value, technological and organizational infrastructure, culture, language, motivation, knowledge transfer and management support. Desouza and Evaristo [12] studied 11 global firms and found three strategies for global knowledge management: headquarter commissioned and executed, headquarter commissioned and regionally executed, and regionally commissioned and locally executed. However, as we have all experienced, knowledge does not always exclusively flow within the domain of formal organizational mechanisms, such as report structures. Many times knowledge is shared through informal mechanisms, such as social relationships among employees [4]. The role of informal networks in distributed and global settings, where retrieval and identification of knowledge becomes a cumbersome task through formal mechanisms, is especially useful [4, 6, 12].

Desouza [10, 11] studied the role of game rooms to assist in knowledge exchange. The study found that informal communication of people, in fact, facilitates knowledge exchange. Nonaka and Takeuchi [22] also studied the process of socialization at various Japanese manufacturing firms and found such socialization positively contributes to knowledge creation and sharing. The saliency of informal roles is best summed up by a senior director of information technology:

“If you need to get certain kind of [knowledge], you know where [the employees] are, and you could at least go to them and make them point you to the right direction...Well that person is either one of few people who has knowledge or one of even fewer people who knows how to go and get it...we contact people, since it is fast...”

Informal networks are composed of social and personal relationships between individuals. Players within these networks act out different roles, such as: central connector, boundary spanner, bridge, expert,
2. Distributedness

Evaristo et al. [14] analyzed “distributedness” in the context of project management in distributed settings by conducting a multi-site field study of corporations from the United States, Japan, and Europe. They found ten dimensions that define “distributedness”. Examples of such dimensions are trust, perceived distance, level of dispersion, synchronicity and types of stakeholders. In our study we see distributedness as being composed of two dimensions: geographical dispersion, meant to indicate physical distance between individuals, and expertise difference, meant to express a perceived distance among individuals [14].

Geographical dispersion takes two forms: local and global. In a local area, people are working either at the same workplace or in a neighborhood and it is easy for them to interact with each other frequently. On the other hand, in a global setting, frequent physical interactions are almost impossible, and issues such as time zones, cultural differences and language barriers often impede clear communication.

Expertise difference has two dichotomous states: heterogeneous and homogeneous. Homogeneity of knowledge is present within organizational functions. For example, an accountant in New York can easily understand the financial aspects of their organization’s branch in England. Similarly, even though system engineers and other types of employees may be separated by geographical distances, they have a degree of homogeneity in the knowledge they create and consume. Heterogeneity of knowledge is always prevalent across organizational functions; the larger and organization grows, the more pronounced this situation becomes. An example is that the same accountant who communicates so well with other accountants may not have the knowledge to understand the local aspects of the information technology network within their organization. Thus, heterogeneity of knowledge between employees in the organization makes it difficult for them to access and transfer knowledge between different functions of the organization.

3. Roles of Players in Informal Networks

Researchers have increasingly been aware of the impacts of informal networks in knowledge management [7, 24]. Informal networks can be defined as networks where individuals are connected based on their social or personal relationships rather than work or task related relationships. Informal networks are not explicitly calibrated in organizational charts; however, they can be seen in almost all organizations [20]. By nature, informal networks are highly dynamic and are difficult to identify. Players in informal networks are identified as nodes that keep networks alive by their links with other nodes. Their links are defined by their social or personal relationships with others. Past literature has found that these players play especially important roles in knowledge creation and transfer [6]. From past literature, five informal network player roles are applicable to our study, based on their relation to knowledge management activities. Those five roles are central connectors, boundary-spanners, gatekeepers, bridges, and experts [3, 19].

3.1 Central Connectors

Central connectors can be identified as people who are frequently contacted by others within a local setting. They have superior local knowledge identification capabilities, know a great deal about their local workplace, and possess localized knowledge. Central connectors can identity what knowledge seekers are looking for, as well as important people who can provide such knowledge. They are akin to search or matching agents who can understand nuances that knowledge seekers may imply but not directly state. Once these connectors identify what knowledge seekers are looking for, they either connect them with people who can provide such knowledge or point them in the right direction.
They help knowledge seekers save time by providing short cuts through a formal system. Examples of central connectors are middle managers who typically have broad knowledge and experience in their local areas. Central connectors work very well in local areas with homogenous knowledge.

3.2 Boundary Spanners

Boundary spanners [27, 1] connect a local network to other networks outside its boundaries. They constantly seek new know-how and have a variety of knowledge not restricted to their functional expertise and local environments. They frequently show up at multi-company research programs or conferences to bring in and put into practice new ideas [8]. Their knowledge of other areas of expertise helps them communicate with those other networks. Boundary spanners may also speak more than one language [3] to help them communicate relatively easily with people working at international offices. Boundary spanners work well with local areas and are accustomed to dealing with heterogeneous knowledge and expertise.

3.3 Gatekeepers

Gatekeepers, as the name implies, control knowledge that enters into or leaves a network. For example, managers of key assembly plants in a manufacturing company can be seen as gatekeepers, protecting the plant’s communication network by controlling the flow of information between the plant and the rest of the company [19]. They protect local networks from threats and rumors from the outside by filtering and screening unnecessary information. Raider et al. [23] studied how intellectual assets are used in a professional services company and found that in one sector there was a formally appointed person who served as a gatekeeper to assure the quality of the knowledge circulated between employees. The gatekeeper is responsible for updating knowledge by examination and screening. Gatekeepers, like central connectors, work well within local areas with homogenous knowledge.

3.4 Bridges

Bridges connect people who do not share common backgrounds, skills, or experiences. Bridges are trustable translators who can speak a variety of languages, and can comprehend knowledge in disparate contexts. Their importance is particularly emphasized when they connect people who have opposite opinions [19]. For example, common conflicts in groups can be seen between an innovator who wants to try new ideas and a conservative who wants to re-use old knowledge. These conflicts occur because they do not have mutual knowledge that helps them understand each other’s point of view. Bridges span this gap. They not only possess broad product knowledge, but also have excellent communication skills. Bridges work very well in both global and heterogeneous contexts.

3.5 Experts

Experts are very knowledgeable about certain types of products, subjects, or processes, and they tend to have very focused and concentrated experience [6]. An expert is usually a person who has a long tenure in a particular organization. Their knowledge is valuable to organizations, since it is unlikely to be captured by any knowledge management tools. Experts excel at learning from experience, as well as identifying, extracting and providing important knowledge to others in an easy-to-understand manner. The pattern recognition and application capability (making connections between past events and current events) of experts is important for knowledge seekers to save money and time on their search costs. Experts deal well with their areas of homogenous knowledge and many times such people are confined to working in local contexts.

4. Knowledge Management Activities

No clear definition is provided for knowledge management in business literature; most studies focus on managing the process itself. Desouza [9] introduced two extreme definitions of knowledge management. One is viewed as a technological initiative approach, which focuses on the use of information technology to manage knowledge in organizations [9]. These initiatives usually result in the implementation of knowledge management systems that codify knowledge and create knowledge networks [16]. The other approach, taken in this study, is called a humanistic approach. It promotes a people centered perspective in which the focus is on managing individuals and teams to foster knowledge sharing and creation [22, 10, 11]. The tenant of this approach is to motivate employees to share know-how with peers for improved organizational performance. These approaches have been encouraged by organizations through mechanisms such as Friday-night poker games, which provide a freeing atmosphere where work-related tips are exchanged and ideas generated [25].
Following the framework of Katzy et al. [18] and Desouza et al. [13] we are focusing on three knowledge management activities: aggregation, transfer, and sensemaking. Aggregation of knowledge calls for the amalgamation of knowledge in one place from a wide variety of sources. This procedure includes contacting someone who has the requisite knowledge or researching it in an electronic, or paper based repository. Transfer calls for the movement of knowledge from one location to another. There are three types of knowledge transfer: transfer across individuals, transfer across units and transfer over time [12]. Transferring knowledge across time periods is particularly important since it enhances knowledge exploitation by utilizing past experiences for current problem solving. If an organization has optimal transfer facilities for knowledge, it avoids the need to store similar knowledge in multiple places. Sensemaking, refers to the comprehension of retrieved knowledge [18, 13]. It also refers to the process of recognizing the context around knowledge and is either conducted through the use of schemas and metaphors or is based on habitual interpretations and behavioral episodes [15]. Sensemaking is important capability for organizations, since it integrates people’s thoughts and generates new knowledge [15].

5. Informal Roles + Knowledge Management

Knowledge flow in informal mechanisms is highly dynamic compared to formal mechanisms, since links and connections are not formally defined. The strengths of informal relationships can easily vanish or persistently survive in this kind of network. Human nodes are important to keep the networks functioning because each human node can be a highly capable search agent, knowledge repository, etc. Cross et al. [4] suggested “to build better networks, focus on who knows what.” The relationship between informal roles and knowledge management is shown in Figure 1.

![Knowledge Management Activities](image)

Based on this research model we have developed certain propositions as follows:

Employees within a local department of an organization constantly seek to aggregate new knowledge in order to perform their task. Aggregation of knowledge, however, is subject to two constraints. First, it may be difficult to locate such knowledge, as the source may be difficult to identify. Second, no employee can spend an infinite amount of resources searching for knowledge. Also, if one was able to identify the source, accessibility to the source may be difficult because employees may not know whom to turn to within an organization. We suggest that when faced with this situation, employees look for a connector. Connectors can be formal or informal mechanisms; here we restrict ourselves to informal ones. The role of the central connector thus emerges. Such individuals can match knowledge seekers with knowledge by either providing a human contact or retrieving such knowledge from a database. Hence we posit the following:

**Proposition 1:** Central connectors have superior local and homogeneous knowledge gathering capabilities.

Besides localized knowledge, individuals will often need to seek out heterogeneous knowledge in other areas. For instance, to solve an accounting issue, one might need marketing or operations related knowledge for a product. Locating knowledge in heterogeneous contexts is more cumbersome than searching in localized areas due to the fact that one has less frequent interactions with such knowledge or agents working in other arenas. When this searching must be done on a global level, the problem becomes more complex so that then one has to traverse geographical boundaries to make the necessary connections. Due to these complexities, the role of boundary spanner emerges to help agents seek out and make contacts with the needed knowledge. We then assert:

**Proposition 2:** Boundary spanners have superior global and heterogeneous knowledge gathering capabilities.

Central connectors have a limited capacity as to the number of people they can connect with at any given time; if this capacity is exceeded, they become inoperable. Cross et al. [4] studied a global network of 218 people in a technology organization and found that a ‘management principal’ becomes a bottleneck for the group, since many people access a central connector to find critical knowledge. As long as the right number of people access them, central
connectors can function well. However, like hubs in a computer network, overcapacity can make them non-functional. More importantly though, central connectors sometimes exert their power and deliberately become bottlenecks to knowledge exchange. Since they control the knowledge flow and connectivity in localized environments, they may use this function to position themselves for more power, politically and for their own self-interest. Moreover their actions affect knowledge search times of their peer agents. Therefore we have the following proposition:

**Proposition 3:** Central connectors negatively affect local and homogeneous knowledge transferring capabilities.

The role of gatekeepers is pivotal. They control what knowledge leaves a given entity and what is allowed to enter. In doing so they ensure knowledge protection and network stability. Thus, global knowledge is not always accessible to everyone. Local knowledge is sometimes restricted and is not allowed to cross boundaries. For example, competitive intelligence related knowledge seldom makes it out of the local group to all members of the organization. While the gatekeeper's intentions may be just, there is a negative effect in terms of knowledge transfer. Hence, we propose that:

**Proposition 4:** Gatekeepers negatively affect knowledge transfer in distributed groups.

Aggregation and transfer of knowledge is useless unless sensemaking occurs. Sensemaking is preceded by schemas that facilitate comprehension and actions. Schemas are developed by common habits and shared experiments. In local organizations, individuals share similar working environments and therefore have a high likelihood of developing similar schemas. Likewise, within functional departments, individuals can share expertise, which may also aid in the development of common schemas for sensemaking. However, when one deals with heterogeneous and global contexts, sensemaking becomes much more challenging. People may speak different languages and possess distinct knowledge sets, which is where the role of bridges emerges. They have capabilities to understand a variety of knowledge in different contexts. They are great translators and can create mutually comprehensible knowledge for diverse parties. Hence, we predict the following:

**Proposition 5:** Bridges have superior local/global and homogeneous/heterogeneous sensemaking capabilities.

One of the most important components of sensemaking is the utilization or exploitation of knowledge. This exploitation is heavily determined by our preconceived schemas and notions. These activities are more common for members who have a long tenure in the organization and have a deep understanding of the knowledge and its associated environments. Exploitation of knowledge takes the form of day-to-day routines. Experts are more likely to be ideal candidates for knowledge exploitation. They learn each time and try to improve what they are doing in a systematic fashion. We thus propose:

**Proposition 6:** Experts have superior knowledge exploitation capabilities.

Knowledge exploration is the flip side to exploitation. This involves a greater deal of experimentation and risk-taking. It requires that an agent always search for new knowledge outside their confines, which is important because it leads to innovation. Boundary-spanners always bring new ideas and perspective to the units that they belong [8]. Thus our concluding proposition:

**Proposition 7:** Boundary-spanners have superior knowledge exploration capabilities.

6. Conclusion

In this paper we have looked at how informal roles affect knowledge management activities. Our work should be viewed as preliminary and has been motivated using a grounded theory approach. We feel that even though our work is preliminary, this paper has made significant contributions in understanding the role of informal networks in distributed knowledge management. However, much work still needs to be conducted to further the knowledge in this area. Of interest would be the study of other informal roles highlighted in the literature and how they affect knowledge management activities. Empirical testing of our propositions is also an interesting avenue for further research. Personnel management implications based on informal roles and their effects on the knowledge management in an organization could also be investigated, as well as efforts to relate knowledge management activities to organizational outcomes such as profits, productivity, employee retention, etc. To summarize, our paper followed a grounded theory and exploratory approach, and suggests that informal roles have definite effects on how knowledge management activities are
undertaken in organizations.

7. References


