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THE RELATIONSHIP BETWEEN SOCIAL INTERACTION IN ORGANIZATIONS AND KNOWLEDGE MANAGEMENT SYSTEM SUCCESS

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Abstract

This study was conducted as a dissertation for the degree of Doctor of Business Administration. The purpose of the study was to expand the base of knowledge in the area of knowledge management, and empirically test the relationship between social interaction within an organization and knowledge management system success. Two aspects of social interaction were measured: interdepartmental connectivity, and interdepartmental conflict. The results of the study indicate that there is a significant relationship between both factors and the success of knowledge management system implementations.

Introduction

Recent developments in information technology have provided the tools that enable companies to explore knowledge management solutions. It has become well recognized, however, that information technology does not in itself create knowledge or guarantee knowledge creation. Literature on knowledge management contends that the sharing of knowledge requires collaboration and interaction across organizations (McDermott, 1999). Empirical determinants of the effectiveness of knowledge management systems, however, are relatively sparse, and there is little field data available upon which to base expectations for their success.

The purpose of this research was to evaluate the relationship between two aspects of social interaction within organizations, interdepartmental connectedness and interdepartmental conflict, and the success of knowledge management system implementations. This paper is based on research conducted for a dissertation for the degree of Doctor of Business Administration at Nova Southeastern University (Delmonte, 2002). It will begin with a review of pertinent literature on knowledge management and organizational culture. The study and its findings will then be discussed, and finally conclusions regarding the implications for future researchers as well as practitioners will be summarized, within the context of other pertinent literature.

Review of Literature

Theoretical Basis of the Study

The base theory for this study is Argyris and Schon's (1978) theory of action perspective. In describing their theory, Argyris and Schon posited that human beings hold two different and inconsistent master designs, the first being the theories that they espouse, and the second the theories that they actually use. Their analysis led to the development of two models of behavior, each with a set of characteristics affecting both theories in use and learning effectiveness.

In Model I behaviors, managers tend to be seen as defensive. Interpersonal and intergroup relations tend to become more self-protective than facilitative. The focus becomes more a matter of win/lose than of collaboration, and results in the generation of mistrust and rigidity. Model I behavior is also geared more toward reaching agreement than it is toward validating the truth of something at issue. Genuine inquiry into underlying meanings and causes does not exist, and theories espoused are at odds with theories-in-use (Kurtzman, 1998).

In contrast to model I, Argyris and Schon (1978) developed a second, more preferable, model of behavior referred to as Model II. Model II behavior is focused on honest communication more aligned with reality. With Model II behavior, theories espoused are more in agreement with theories-in-use, and the result is strong reasoning and productive outcomes (Kurtzman, 1998). With Model II behavior Argyris and Schon (1978) determined that the degree of defensiveness in individuals, within groups, and among groups will tend to decrease over time.

In relating the two types of behaviors to organizational learning, Argyris and Schon (1978) defined two types of learning: single-loop learning and double-loop learning. Single loop learning is based on Model I type behaviors, and is defined as instrumental learning that changes strategies of action, or assumptions upon which strategies are based, but leaves the values, which lead to those strategies and actions, unchanged. Double-loop learning is defined as learning that results in a change in underlying organizational values and norms, as well as the strategies and assumptions resulting from those values and norms. Double-loop learning is based on Model II type actions and behaviors.

Lipshitz (2000) provided an in-depth analysis of Argyris and Schon's extensive work on organizational learning, using a review of related literature over the past 20 years. The analysis concluded that organizations are both holding environments for knowledge as well as representations of knowledge embedded in their structure and culture. It also concluded that if an organization is to benefit consistently from learning, the critical issue is not how to solve a particular problem, but rather to create the conditions that facilitate people's ability to detect and correct problems.

Organizational Learning and Knowledge Management

In discussing organizational learning and knowledge management, De Long and Fahey (2000) argued that in order for an organization to question fundamental knowledge about its core technologies or competitive environment, double-loop learning must be applied. This is necessary in order to challenge long held assumptions, so that errors in existing norms and practices can be diagnosed and corrected. They stated that if employees believe that sharing what they know has the potential for them to incur personal risk, or reduce their perceived power, then "the social norms governing how individuals should interact will not support the behaviors needed to create and sustain the exchange of knowledge" (p 4). De Long and Fahey's model of cultural characteristics that shape social interaction and leverage knowledge are consistent with the Model II behaviors described by Argyris and Schon (1978).

The uniqueness of knowledge management systems stems from the necessity to draw from the firm's intellectual capital to form the basis for their value (Smith, 1998). Companies that consider themselves successful in knowledge management implementations appear to agree that the biggest challenge is properly addressing the cultural-change issues associated with the creation of effective communicating teams, and where the sharing of knowledge is viewed as a benefit rather than a risk (Davenport, 2000). Even in companies considered to be best-practice organizations, it has been found that greater management focus is required in order to improve the sharing of knowledge (Carlin & Womack, 1999).

Knowledge Management and Collaboration

Wenger and Snyder (2000) define communities of practice as "groups of people informally bound together by shared expertise and passion for a joint enterprise" (p. 139). Lesser and Storck (2001) found that the social capital resident in communities of practice leads to behavioral changes, which in turn positively influence business performance. Unlike formal work groups or project teams, the members themselves form communities of practice, for the sole purpose of developing the capabilities of the members and to build and exchange knowledge (Carlin & Womack, 1999).

As the economy shifts more and more to knowledge work, collaboration at the interorganizational level is necessary to turn tacit knowledge into explicit knowledge (Scott 2000). Getting people to break the culture of hoarding knowledge requires new business processes combined with a new form of trust between employers and employees (Hibbard & Carrillo, 1998). Even though experts within an organization may be encouraged to engage in free sharing of information with colleagues, many question whether the use of their knowledge in that way will result in negative consequences with respect to their own careers (Mueller & Dyerson, 1999).

Knowledge Management and Conflict

De Long and Seeman (2000) discussed how knowledge management initiatives are hindered by conceptual confusion resulting in conflict. This arises primarily due to the differing perspectives on knowledge management that must be integrated in order to implement a long-term strategy. Alavi & Leidner (1999) interviewed 109 participants in an executive development program conducted at Northeast University in 1997. When asked about their key concerns about knowledge management, the executives indicated that the primary concern was with regard to the difficulties in convincing people and business units to volunteer their knowledge, particularly when each business unit was responsible for generating a profit.

This can be related to the idea of double-loop learning put forth by Argyris and Schon (1978). The behavior associated with double-loop learning allows for the seeking out of people in the organization who are most competent to make decisions on the problems to be solved without feelings of threat or insecurity (Argyris & Schon, 1996). A major challenge associated with building this kind of environment is to recognize and defuse the defensive routines, which have been built up over a period of time through deep-seated differences between espoused theories and theories-in-use. Doing this requires reflection, inquiry, and self-disclosure (Senge, 1990b). The absence of this type of dialogue is indicative of an organization involved in single-loop learning, or no learning at all, and is a breeding ground for interdepartmental conflict (Senge, 1990a).

Relevance to the Current Study

The literature discussed above indicates that successful knowledge management is highly dependent on the development of an organizational environment committed to learning and sharing of knowledge through trust. There is also evidence that people learn and share knowledge on the job through informal as well as formal channels. The marketing literature (Jaworski & Kohli, 1993) refers to the degree of formal and informal direct contact among employees across departments as interdepartmental connectedness. Related literature (Deshpande & Zaltman, 1982) suggests that connectedness facilitates the exchange and use of information across organizational boundaries. Conversely, Jaworski and Kohli (1993) and Ruckert and Walker (1987) point out that interdepartmental conflict, referring to the tension among departments from the incompatibility of desired responses, is likely to inhibit communication across departments.

These discussions on social interaction and knowledge sharing, leads to the belief that higher levels of social interaction combined with lower levels of conflict can enhance the probability for success in knowledge management initiatives. While there is a great deal of direct and indirect speculation in the literature leading to this belief, it does not appear to have ever been directly correlated or empirically tested. This concept of social interaction and conflict in the midst of knowledge management systems implementation led to the motivation for this study.

Research Design

Two independent variables, interdepartmental conflict and interdepartmental connectedness were used in this study. Interdepartmental conflict is defined as the desire of individual departments to be more important or powerful than other departments, either self-generated or as a result of the inherent charters of the departments (Kohli & Jaworski, 1990). In describing the behavioral consequences resulting from a Model I theory-in-use, Argyris and Schon (1996) listed power-centered competition and rivalry, defensive interpersonal and group relationships, mistrust and lack of external commitment. For this study it is inferred that the consequences of a Model I theory-in-use are equated with interdepartmental conflict. Interdepartmental connectedness refers to the degree of formal and informal direct contact among employees across departments (Kohli & Jaworski, 1990). The behavioral consequences resulting from a Model II theory-in-use include an emphasis on double-loop learning, decreased defensiveness within and among groups, concern for others ideas, and freely allowed confrontation of one's own ideas and assumptions (Argyris & Schon, 1996). For this study, it is inferred that the result of a Model II theory-in-use are equated with interdepartmental connectedness. The dependent variable was knowledge management systems success. The research model is shown in Figure 1.

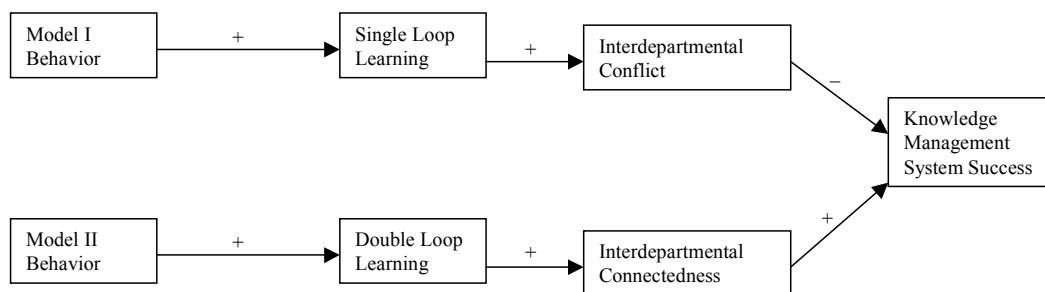


Figure 1. Research Model of Social Interaction to Knowledge Management System Success

Research Methodology

Two research questions were examined in this study:

- Is there a relationship between interdepartmental connectedness and interdepartmental conflict, and the success of knowledge management systems implementations?
- Does the degree of interdepartmental connectedness or interdepartmental conflict affect the success of knowledge management systems implementation?

From these research questions, two hypotheses were derived. The null hypotheses were stated as follows:

- H1₀ Higher levels of interdepartmental connectedness result in lower or unchanged levels of knowledge management systems success.
- H2₀ Higher levels of interdepartmental conflict result in higher or unchanged levels of knowledge management systems success.

Operationalization of Variables

The two aspects of social interaction chosen for this study were interdepartmental connectedness and interdepartmental conflict. The measurement instruments used for these two variables were taken directly from existing instruments. The instrument used for the measurement of the success variable was developed from a combination of existing studies on information systems success. The development of all variables and the rationale for their selection is discussed here.

Interdepartmental Connectedness

Interdepartmental connectedness is defined as the degree of formal and informal direct contact among employees across departments (Kohli and Jaworski, 1990; Tjosvold, 1990). There are several examples of recent studies which indicate that informal networks rather than formal organization structures are increasingly affecting organizational activities and outcomes (Menon et. Al., 1997). This is related to knowledge management projects in the discussions on communities of practice (Carlin & Womack, 1999; Wenger & Snyder, 2000). Specifically, Lesser and Storck (2001) showed how the social capital resident in communities of practice leads to behavioral changes, which in turn positively influence business performance. Adams & Freeman (2000) also concluded that successful knowledge management implementation requires that the human side of the equation be looked as well as the data side, and that implementation can only be done successfully if a community of practice is in place.

Interdepartmental Conflict

Interdepartmental conflict is the tension among departments arising from the incompatibility of actual or desired responses and goals (Raven and Kruglanski, 1970). Recent studies have shown the relationship between conflict and product quality (Menon

et.al., 1997) as well as the effect on the perception of commitment in dyadic relationships (Anderson and Weitz, 1992). In their studies on market orientation, Jaworski and Kohli (1993) showed that interdepartmental conflict inhibits intelligence dissemination. This was specifically related to knowledge management initiatives by De Long & Seeman (2000), in their identification of four sources of conflict that are likely to threaten credibility during the course of the initiative.

Knowledge Management System Success

The knowledge management system success variable was developed from a number of studies on the success of various types of information systems. DeLone and McLean (1992) undertook an extensive study to provide an integrated view of the concept of information systems success. Seddon et. al. (1999) built on the DeLone and McLean model, as well as other research, to develop an alternative framework. Davenport, et. al. (1998) de-emphasized the information systems aspect and focused specifically on the success of knowledge management projects.

For purposes of this study, an aggregate measure was developed combining the knowledge management specific components of the Davenport et. al (1998) study with the information systems aspects of the Seddon et. al. (1999) and DeLone and McLean (1993) models.

The Survey Instrument

A combination of survey instruments was used for this study. For the independent variables, a seven-question instrument for each of interdepartmental connectedness and interdepartmental conflict developed by Jaworski and Kohli (1993) was used. For the dependent variable, an instrument containing a combination of questions from Seddon et. al. (1999) and Davenport et. al. (1998) was developed to measure knowledge management systems success.

The research was conducted using a combination of mailed and web based surveys. Three mailed surveys were conducted over a three-month period, and the Web based survey was available on line for three months. The first mailing was made to attendees at the American Productivity and Quality Center's Knowledge Management Symposium held in Houston, TX during September 2001. For this mailing, 245 surveys were mailed, with 42 being returned due to incorrect address information, or employees no longer with the organization. Of the remaining 203 surveys, 50 were returned resulting in a response rate of 24.6 percent.

The second mailing was made to executive managers at companies identified in KMWorld Magazine as the "100 Companies That Matter in Knowledge Management". Surveys were sent to 100 senior executives in 31 of the 100 companies. Only two surveys were returned from this mailing for a response rate of 2 percent.

A third mailing was made to Human Resource executives in Fortune 100 corporations that had previously expressed interest in knowledge management initiatives. 600 surveys were sent out with 28 responses received for a response rate of 5%.

Participation in the Web based survey was offered through postings placed on the Web sites of knowledge management interest groups, supplemented by emails sent to a variety of contacts in companies known to have knowledge management initiatives. Postings were placed on 4 interest group Web sites, and approximately 100 emails were sent to contacts obtained from a variety of sources. 461 individuals followed the link from the interest group site, or from the email received, to the survey Web site and viewed the introduction. Of those individuals 257 viewed the survey itself, with 26 actually submitting a completed survey. The response rate therefore from individuals viewing the introduction was 5.6 percent, and 10.1 percent from those viewing the survey.

In total, 101 usable surveys for analysis in the study were received from all sources.

Analysis and Presentation of Findings

Analysis

Factor analysis was used to empirically assess the dimensionality of the scales to be used in the testing of the hypotheses. This factor analysis was done using principal components analysis with no rotation. Factors were selected using Eigenvalues greater than 1 and factor loadings exceeding $\pm .55$. This analysis resulted in two dimensions being identified, one relating to the access

to information, and the other related to the formality of communications. On the success scale, unidimensionality was determined in six of the seven variables so the outlying variable was dropped from the summated scale used for the hypothesis testing.

Hypothesis testing was performed using One-Way ANOVA to determine significance, and Pearson correlation analysis was used to determine directionality. Sufficient evidence was found to reject the null hypotheses in both cases. A summary of the results are shown in Table 1.

Table 1. ANOVA and Correlation Analysis Results Using Success as Dependent Variable

Independent Variable		Sum of Squares	df	Mean Square	Critical Value at .95 Percentile	F	Sig.	Pearson Correlation Coefficient
Connectedness Access Dimension	Between Groups	185.189	16	1.137	1.780	2.051	.018	
	Within Groups	47.101	85	.554				
	Total	65.290	101					0.373
Connectedness Formality Dimension	Between Groups	9.095	7	1.299	2.030	2.173	.043	
	Within Groups	56.195	94	.598				
	Total	65.290	101					0.293
Conflict	Between Groups	25.444	21	10212	1.79	2.433	.002	
	Within Groups	39.846	80	.498				
	Total	65.290	101					-.476

Confirmatory analysis was also performed using linear regression, enter method, resulting in an R² value of .231 with all three variables entered.

Findings and Conclusions

Throughout the literature, there is speculation that organizational culture and various forms of social interaction, both negative and positive, impact the success and effectiveness of knowledge management system implementations. The conclusions drawn from this study provide strong empirical evidence to back up that speculation. The data indicate that from the perspective of both connectivity and conflict, a significant relationship exists between social interaction and knowledge management system success. The following sections will discuss each of these areas in the context of current pertinent literature.

Interdepartmental Connectedness

The data related to positive interaction, interdepartmental connectedness, show that there are two different dimensions of social interaction which impact success. Both dimensions showed a moderate positive and significant correlation to knowledge management system success. The first dimension is that of access to other individuals and sources of information within the organization. This has been referred to in this study as the access dimension. In some respects, this aspect is at the very core of knowledge sharing. Davenport and Prusak (1998) state that the most effective way for an organization to transfer knowledge is to hire smart people and let them talk to one another. They point out, however that most organizations hire bright people and then either isolate them or overburden them with tasks that limit their availability to others in the organization.

In his discussion of the organizational school of knowledge management, Earl (2001) points out the importance of “knowledge communities” which brings together people with common interests, problems or experiences. In analyzing several examples of organizations with effective knowledge communities, Earl (2001) concludes that their effectiveness has likely been aided by a tradition of sociability and networking. He also points out that teams formed by employees, and the synergies resulting from those teams, result in organizational learning.

The second dimension of interdepartmental connectedness refers to the formality of the communications channels within the organization. This is referred to in the study as the formality dimension, and relates to the availability of informal communications mechanisms within the organization. Swap et. al (2001) discuss at length the importance of informal communications mechanisms in the learning and knowledge sharing process in organizations. They point out numerous examples of how mentoring is used to convey knowledge about organizational routines and informal managerial systems. Rather than formal teaching mechanisms, this mentoring role, in many cases relies on the use of storytelling and observation of a mentor's behavior.

Earl (2001) also discussed the importance of informal communications in his description of the "spatial school" of knowledge management. Alternatively called the social school, the key focus is on encouraging socialization as a means of knowledge exchange. While electronic communications may tend to improve the efficiency of communications, the knowledge transfer required for knowledge management success requires both efficient and effective communications. This is consistent with the findings of Roberts (2000), which indicate that the trust and mutual understanding required for the transfer of tacit knowledge, while possible through electronic communications, is much more effective through face-to-face contact.

Interdepartmental Conflict

The negative aspect of social interaction measured in this study was interdepartmental conflict. Conflict takes on many forms within organizations. On occasion, conflict in organizations results in dramatic confrontations such as strikes, walkouts, and firings, however more often than not it is embedded in routine interactions between individuals as they go about their daily activities (Kolb & Putnam, 1992). The elements measured in this study relate specifically to those types of routine interactions such as interpersonal communications across departments, compatibility of goals and objectives, and protecting of one's turf.

The effective sharing of knowledge requires interorganizational collaboration and a focus on organizational learning (McDermott, 1999; Scott, 2000). Organizational learning, as we have seen, will not take place without an environment of trust and respect (DeLong and Fahey, 2000; Hibbard & Carrillo, 1998). Lack of trust is cited as the number one cultural barrier, or "friction", to knowledge management success by Davenport & Prusak (1998). DeLong & Fahey (2000) also stated that lack of trust relates directly to the organizational norms associated with sharing information.

The freedom to question and provide constructive criticism is also an important factor in the sharing of knowledge. Open criticism of ideas is an essential component of organizational learning, and hence knowledge management, but when the environment fails to recognize such criticism as healthy, conflict results and questioning is seen as merely sticking one's neck out for no apparent value (Coates, 2001). This is exacerbated by the reality that the transfer of tacit knowledge within an organization often brings together individuals and groups that would not otherwise be in regular contact, and are more likely accustomed to being in competition, rather than in collaboration, with one another (Hinds & Aronson, 2002).

Implications for Practitioners

There are a number of implications of this study, for organizations involved in, or embarking on, knowledge management initiatives. First and foremost, as is increasingly noted in the knowledge management literature, successful knowledge management is not a technology issue. The results of this analysis provide additional evidence that organizations must first look to the culture inherent in the organization, and the state of the social interactions among its members before embarking upon a quest to capture and share knowledge. This culture must begin with the CEO and become ingrained in the mission and values of the organization.

The specific findings of this study point to several areas of focus. The data regarding the formality dimension of connectedness imply that organizations which take overt steps to facilitate the bringing together of individuals with common interests, improve their likelihood of success in knowledge sharing. Encouragement and facilitation of cross-organizational communities of practice are a positive step toward bringing down the smokestacks that are a death knell to effective knowledge management.

The data regarding the access dimension of connectedness also reinforce the need for the facilitation of face-to-face communication. The effective use of teams and teamwork provide an excellent mechanism for nurturing the open communications structure required for effective knowledge sharing. The encouragement and facilitation of communities of practice that span the entire organization can be an important component of an overall knowledge management strategy.

The implications of the conflict data also point out a number of areas for focus. Convincing people to share their knowledge requires a combination of new processes, a level of trust among employees, as well as between employees and managers. People must feel comfortable that they will not lose their value to the company after sharing their knowledge with others and committing it to electronic form. This requires a clear statement of values set out from the top management levels of the organization. If an organization is truly committed to the seeking out and sharing of the tacit and explicit knowledge within the organization, then the company mission and value statements must clearly represent that commitment, and it must be effectively communicated down through the entire organization. Most importantly, as Argyris and Schon (1978) have so adequately described, management must follow through and ensure that their theories in use are consistent with their theories espoused.

Future Research

Several possibilities for future research emerge from the results of the current study. First, the current study was exploratory in nature with a limited number of respondents from a single organization. It did not attempt in any way to isolate specific conditions that may tend to moderate the results within a specific organization. Likewise, the success data was based purely on the opinion of the respondent. A focused study within several organizations, using a cross-section of individuals, combined with an objective evaluation of the success of the knowledge management initiative, would provide useful follow-on research.

Additionally, there was no attempt to classify results based on type or size of the organizations. Opportunities for similar research would appear to exist in this area, to determine if the study factors differ based on organization type, makeup, or organizational structure.

While this study was focused on the effect of social interaction on knowledge management initiatives, there is evidence in the literature that an effective knowledge management strategy may itself tend to enhance social interaction. In that regard, it would appear that a longer-term study examining the changes in social interaction before and after knowledge management system implementation would yield useful and interesting results.

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