



The Impact of Trust on the Benefits Obtained from Knowledge Sharing

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ABSTRACT

Knowledge sharing is currently at the forefront of research in the areas of organizational management and electronic business. Research has focused on aspects of knowledge sharing such as trust, quality of knowledge shared, and task complexity. This paper builds on past inquiries of trust in knowledge sharing by examining how the benefits obtained from knowledge sharing change as trust levels change. A Repeated Measures ANOVA design is used to test the impact of trust on knowledge sharing. Task completion time, the dependent variable, measures the effect of knowledge sharing. Statistical analysis suggests that the benefit obtained from knowledge sharing increases as trust level increases.

INTRODUCTION

Knowledge is not a "thing" that can be "managed". It is a capacity of people and communities, continuously generated and renewed in their conversation, to meet new challenges and opportunities (Grant 1995). Knowledge comes into being, is shared, given meaning, evaluated, developed, accessed, and applied best by groups of people. Knowledge is of limited value if it is not shared. Knowledge sharing involves the integration of explicit, formalized information existent in an organization with the tacit knowledge existent in the minds of individuals in an organization.

Trust is a basic feature of social situations that require cooperation and interdependence (Earley 1986). It is a key to positive interpersonal relationships in various settings (Lewis and Weight 1985) because it is central to how individuals interact with others. Thus, trust has a central role in knowledge sharing, which refers to all activities intended to establish, develop, and maintain the exchange of knowledge.

Trust has been studied extensively in many research disciplines such as economics (Anderson and Weitz 1992). Agreement concerning the positive effects of trust is rising (Kramer and Tyler 1996), and consensus has emerged on how interpersonal trust evolves (Zand 1972). However, the current literature does not address varying degrees of trust and how they may influence knowledge sharing.

The research reported in this paper contributes to the knowledge sharing literature by addressing the issue of how changing trust levels impact knowledge sharing. We argue that as trust level increases, the benefits obtained from knowledge sharing increase. While preparing the experiment for this research, the issues of knowledge quality and task complexity were identified as relevant for knowledge sharing (Mayer 1995). However, in an effort to isolate impacts of trust levels, knowledge quality and task complexity were held constant. The next section discusses some of the underlying concepts relevant for knowledge sharing and formally presents the research hypotheses. Then in Section 3 the research design and methodology are described. Section 4 presents our experimental results and findings, and Section 5 draws conclusions and makes suggestions for future research.

UNDERLYING CONCEPTS AND HYPOTHESES

Trust

The development of trust was first theorized by Lewis and Weight (1985), followed a decade later by Lewicki and Bunker (1995), who present three bases to interpersonal professional trust: deterrence based

trust, knowledge based trust, and identification based trust. According to Lewicki and Bunker (1995), trust develops in stages over a period of time, with deterrence-based as the first stage with the lowest level of trust and identification based as the last stage having the highest level of trust.

Deterrence-based trust is where trading partners do what they say they will do because of a fear of punishment if they do not perform consistently. Knowledge-based trust is linked to knowledge of the other trading partner, which allows the trustor to understand and predict the behavior of the trustee. Identification-based trust is based on empathy and common values with the other trading partner's desires and intentions to the point that one trading partner is able to act on or as an agent for the other with the evolution of time. By alleviating the fear of the unexpected and facilitating interactions and involvement, trust encourages a climate conducive to the sharing of knowledge (Giffin 1967). This paper thus hypothesizes that trust is a determinant of knowledge sharing.

Knowledge Quality

A knowledge quality model developed by Rubenstein-Montano and Wang (2002) is adopted in this paper. In their model, knowledge quality is evaluated along the dimensions of validity and utility using a 7-point Likert-scale. The evaluations are made by individuals after receiving knowledge for task completion (Miller 1956). A number of knowledge management systems already evaluate knowledge quality in this way (Mayer 1995). To isolate the trust variable, only knowledge of high quality (7-point Likert value of 5-7) was used in knowledge sharing for this experiment.

Task Complexity

A task complexity model developed by Rubenstein-Montano and Wang (2002) is adopted in this paper. In their model, there are three dimensions to make up task complexity: knowledge intensiveness, knowledge type, and knowledge location. Only tasks of high complexity (7-point Likert value of 5-7) were used in knowledge sharing for this experiment to isolate the trust variable.

Hypotheses

As mentioned in the Introduction, much research on knowledge sharing is present in the literature. However, the current literature does not adequately test the impact of different levels of trust on knowledge sharing. This paper posits that the time and effort spent in knowledge sharing may not be warranted when there is a low level of trust. In such cases, the individual would spend as much or even more

time completing the task alone than with the help of another, henceforth expert, because time must first be spent building trust. Additionally, the expert can use that time not spent sharing knowledge to complete other tasks. In contrast, for high level of trust, expert assistance has a greater effect on enhancing performance by decreasing the time required to complete the task. This leads to the hypothesis tested in this paper, which is stated formally as follows:

A high level of trust between individuals involved in knowledge sharing is predicted to result in quicker task completion time than a moderate level of trust between individuals. A moderate level of trust between individuals is, in turn, predicted to result in quicker task completion time than a low level of trust. Thus, as trust level increases, the value of knowledge sharing increases.

DESIGN AND METHODOLOGY

The 3 X 2 experiment is a Repeated Measures design with 6 data points in each cell. Thirty-six data points were obtained from 12 subjects during the experiment. The two independent variables are trust level with three levels and treatment with two levels. Levels of trust are varied as low, moderate, and high. The two treatments are treatment A (no sharing) and treatment B (sharing of highly specific and relevant knowledge). Task completion time, as the dependent variable, has become an important outcome measure (Hansen 1999) and is thus an appropriate measure for this experimental study. The research hypothesis posited in this paper is evaluated by comparing the impacts of three levels of trust on the value of knowledge sharing (i.e., given a level of trust, how much time is saved by knowledge sharing when completing a task).

The lead author of this paper served as the expert in this experiment. Thus, she is the person to who subjects in the experiment turned for knowledge when completing assigned tasks. The subjects were graduate students with who the expert developed a relationship over a period of three months in a term project, and the expert was also a graduate student. Questions were answered using pre-defined pieces of knowledge only. This ensures that sharing was consistent across subjects. For measuring completion time, subjects were instructed to complete the tasks as quickly as possible without sacrificing quality (Surinder and Cooper 1999). Task completion time includes time spent in knowledge sharing so the benefits and costs of such sharing are captured in the completion time.

Three separate tasks, each of equal levels of complexity, comprise the experiment. Each of the three tasks was completed at different points during the three month period, at the beginning of the project, at the middle of the project, and at the end of the project, as trust between the expert and the subjects developed from level 1 (low level), deterrence-based, through level 3 (high level), identification-based.

In addition, pre-experiment and post-experiment surveys were used for each task to verify the experimental design and results (Kaplan and Duchon 1988). A 6-point Likert-type scale was used for the pre-experiment survey to assess the subjects' relationship with the expert. The survey is based on that of Mayer et al. (1995). Likert values of 0-1 represent low trust level, values of 2-3 represent moderate trust level, and values of 4-5 represent high trust level. On average subjects rated their trust levels as 0.89, 2.21, and 4.34 for task 1 through task 3 respectively.

A 7-point Likert-type scale was used for post-experiment survey responses. Subjects were queried regarding the difficulty of each task to ensure the three tasks were of equal levels of complexity. Responses were used in conjunction with completion time to verify that assignments of the tasks were valid. Furthermore, subjects answered questions about the usefulness and relevance of shared knowledge to verify it was of high quality.

DATA ANALYSIS AND DISCUSSION

The experimental results were analyzed by two-way Repeated Measures ANOVA and Bonferroni tests. Table 2 provides the results of

the ANOVA analysis for trust level. Trust level has a significant effect on task completion time ($F = 30.529$, $P = .001$). In tables 1 and 3, the means of the 6 groups and Bonferroni tests for difference in means are shown. A high level of trust between individuals involved in knowledge sharing is predicted to result in significantly quicker task completion time than a moderate level of trust between individuals ($MD = 14.1111$, $P = .015$). Moreover, a moderate level of trust between individuals is, in turn, predicted to result in significantly quicker task completion time than a low level of trust ($MD = 15.000$, $P = .012$). Therefore, the Hypothesis is supported. Furthermore, for treatment A, no knowledge sharing, the mean task completion time for the 3 different tasks is almost the same (table 1 and 3), which further supports our claim that task complexity was held constant in the experiment.

Table 1: Mean task completion times (in minutes)

Trust-Knowledge Combination	Mean	Standard Deviation
Trust level 1 treatment A	48.338	5.421
Trust level 1 treatment B	47.733	5.125
Trust level 2 treatment A	49.234	6.021
Trust level 2 treatment B	28.215	4.584
Trust level 3 treatment A	47.234	5.017
Trust level 3 treatment B	13.243	4.287

Table 2: ANOVA (test of within-subjects effects)

Source	F	Sig.
Trust	30.529	.001
Treatment	16.742	.000

Table 3: Comparison of means (Bonferroni)

Knowledge Sharing (treatment B)	Mean Difference (MD)	Sig.
Trust level 1—trust level 2	15.000*	.012
Trust level 1—trust level 3	22.1111*	.000
Trust level 2—trust level 3	14.1111*	.015
No Knowledge Sharing (Treatment A)		
Trust level 1—trust level 2	9.1111	.795
Trust level 1—trust level 3	18.2222	.095
Trust level 2—trust level 3	9.1111	.795

*. The mean difference is significant at the .05 level.

CONCLUSIONS AND FUTURE DIRECTIONS

This experimental study shows that the level of trust between individuals involved in knowledge sharing will significantly impact whether such activities will be of value. The data analysis fully supports the hypothesis that as trust level increases, the value of knowledge sharing increases. However, there are now many more things to be considered.

A caveat of this research is that it involved student subjects. While the nature of their tasks can be generalized to other organizations, a next step in illustrating the role of trust levels on knowledge sharing would be to experiment in a commercial organization. A primary reason for this is that the motivation for knowledge sharing will be different. In a commercial organization employees will partici-

pate in knowledge sharing to preserve their livelihood whereas in a university setting students will participate in knowledge sharing to preserve their grades. The issue of which motivational factor is stronger, and the importance of motivation, are not within the scope of this study and are left for future research.

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