EXCHANGE IDEOLOGY, KNOWLEDGE SHARING VISIBILITY AND KM TECHNOLOGY: EXPLAINING THE EFFECT OF ORGANIZATIONAL REWARD ON EMPLOYEE KNOWLEDGE SHARING BEHAVIOR

XI ZHANG

DOCTOR OF PHILOSOPHY
CITY UNIVERSITY OF HONG KONG
JULY 2009
CITY UNIVERSITY OF HONG KONG

Exchange Ideology, Knowledge Sharing Visibility and KM Technology: Explaining the Effect of Organizational Reward on Employee Knowledge Sharing Behavior

Submitted to
Department of Information Systems
in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

by

Xi Zhang

July 2009
ABSTRACT

Although knowledge sharing (KS) is a critical step in organizational knowledge management (KM), most organizations face the serious problem of employees being unwilling to share knowledge in knowledge management systems (KMS). As a direct organizational strategy, reward systems have been applied to encourage individual KS behavior in KMS. However, KS literature offers inconsistent findings on the effect of organizational reward systems on employees’ KS behavior. Some studies explain the reward-KS relationship by considering the moderating effect of individual exchange ideology (EI), but the findings report ambiguous moderating effects of EI in different task environments. This suggests that the effects of reward on KS are not only dependent on EI, but also dependent on task environment variables in the KMS, i.e., knowledge sharing visibility (KSV).

Considering the ambiguous findings on the effects of reward systems on KS behavior in KMS, the research goals of this research are: 1) to determine whether organizational rewards significantly enhance employees’ KS for different EI levels and different KSV levels, and 2) to investigate how to design KMS to support high KSV environments.

This dissertation has adopted three studies with quantitative and qualitative methods to achieve these research goals. Study 1 tested the two-way interaction effect of EI and reward (EI×Reward) on KS in the IT-supported environment. Survey data were collected from 113 part-time graduate studies in the HKNet project, including four universities from three regions (Netherland, Hong Kong and Mainland China). Study 2 tested the three-way interaction effect of EI, reward and KSV (EI×Reward×KSV) on KS in KMS, with survey data collected from 96 part-time MBA students who are knowledge workers in different organizations. Study 3 adopted a case method approach with qualitative and quantitative data. The data were collected from 159 respondents and 16 interviewees in an electronic power service Chinese company. In the quantitative phase, we re-tested the three-way interaction in the case company; in the qualitative phase, we investigated how six KM technology functionalities impacted on three determinants of KSV.
The results of the quantitative studies indicate that the moderating effect of EI and reward is dependent on levels of KSV. The results of study 1 show that EI×Reward has a negative influence on the prediction of KS in the low KSV environment. The results of study 2 with cross-organizational samples and the results of the quantitative survey of study 3 with samples in Chinese case company both show that EI×Reward×KSV has a positive interaction on the prediction of employee KS behaviors in KMS. Specifically, in the KMS with high KSV, the positive effect of reward on KS is stronger when the employees’ EI is higher.

Results of qualitative interviews in study 3 indicate that some KM technology functions (i.e., statistical, tracking, knowledge distribution and knowledge storing) positively impact on KSV in the KMS, while some communication and collaboration tools (e.g., instant messengers) have a negative influence on KSV.

This research contributes theoretically to KS literature in explaining the ambiguous findings of previous studies on reward-KS relationship and interaction effects of EI and reward by considering KSV as third-level moderator. This research also has theoretical contributions for KMS design literature by showing that KSV can be enhanced or reduced by adding or deleting some specific technology functions. Implications for practice, limitations and directions for future studies are offered.
# TABLE OF CONTENTS

## ABSTRACT

CHAPTER 1
INTRODUCTION
1.1 PROBLEM STATEMENT
1.2 RESEARCH OBJECTIVES
1.3 RESEARCH QUESTIONS
1.4 RESEARCH APPROACH OVERVIEW
1.5 POTENTIAL CONTRIBUTIONS
1.6 DEFINITION OF KEY CONCEPTS
1.6.1 Knowledge, Knowledge Sharing, Knowledge Management Systems
1.6.2 Reward Systems
1.6.3 Exchange Ideology
1.6.4 Knowledge Sharing Visibility
1.6.5 KM Technology Functionalities
1.7 THE STRUCTURE OF THIS DISSERTATION

CHAPTER 2
LITERATURE REVIEW
2.1 KS IN KNOWLEDGE MANAGEMENT SYSTEMS (KMS)
2.1.1 KS Dilemmas in KMS
2.1.2 Participants in KMS
2.1.3 Types of KS Dilemmas in KMS
2.1.4 Costs and Benefits of Individual KS
2.1.5 Strategies for Supporting KS
2.2 EFFECT OF REWARD SYSTEMS ON KS THROUGH KMS
2.2.1 Application of Reward Systems
2.2.2 Ambiguous Findings of Reward Systems
2.2.3 Reasons and Theories
2.3 SOCIAL EXCHANGE THEORY (SET)
2.3.1 Logic of SET
2.3.2 Relevance of SET
2.3.2.1 KS as Social Exchange
2.3.2.2 SET versus Other Theories in Explaining Reward-KS relationship
2.3.3 Exchange Ideology ................................................................. 34
2.3.4 Critique of SET ........................................................................ 36

2.4 SOCIAL LOAFING THEORY (SLT) ........................................... 37
2.4.1 Logic of SLT ........................................................................ 37
2.4.2 Relevance of SLT ................................................................. 38
   2.4.2.1 Social Loafing in KS ......................................................... 38
   2.4.2.2 SLT versus Other Theories ............................................. 39
   2.4.2.3 Antecedents of Social Loafing ...................................... 39
2.4.3 Task Visibility and Knowledge Sharing Visibility .................. 41
   2.4.3.1 Effects of TV on Social Loafing .................................... 41
   2.4.3.2 Determinants of Knowledge Sharing Visibility (KSV) .... 42
   2.4.3.3 Effects of Information Technology on KSV ................. 45

2.5 KM TECHNOLOGY FUNCTIONALITIES IN KMS ................. 46
2.5.1 KM Technology ................................................................. 46
2.5.2 KM Technology Classification and IT Functionalities .......... 47

2.6 GAP ANALYSIS OF PREVIOUS STUDIES .................................. 49

CHAPTER 3 ....................................................................................... 52

RESEARCH APPROACH ....................................................................... 52

3.1 THESIS FRAMEWORK ................................................................. 52
   3.1.1 Overarching Framework: A Socio-Technical Perspective .... 52
   3.1.2 Multiple Theory Integration ............................................. 57

3.2 STUDY 1 ..................................................................................... 60
   3.2.1 Research Model ................................................................. 60
   3.2.2 Hypotheses Development ................................................. 61
      3.2.2.1 Economic Rewards .................................................... 61
      3.2.2.2 Social Rewards ......................................................... 62
      3.2.2.3 Exchange Ideology as a Moderator ......................... 63

3.3 STUDY 2 ..................................................................................... 65
   3.3.1 Research Model ................................................................. 65
   3.3.2 Hypotheses Development ................................................. 66

3.4 STUDY 3 ..................................................................................... 67
   3.4.1 Quantitative Research Framework .................................... 67
   3.4.2 Qualitative Research Framework ..................................... 68

3.5 CHAPTER SUMMARY ................................................................. 70
# RESEARCH METHODOLOGY

## 4.1 RESEARCH METHOD CHOICE

4.1.1 Multi-Method Research

4.1.2 Quantitative Survey Method

4.1.3 Qualitative Case Method

## 4.2 QUANTITATIVE SURVEY METHOD OF STUDY 1

4.2.1 Measurement

4.2.2 Data Collection

4.2.2.1 Context of Study 1: HKNET Project

4.2.2.2 Survey Administration Procedure

4.2.2.3 Survey Response and Representativeness

4.2.2.4 Demographic Statistics

## 4.3 QUANTITATIVE SURVEY METHOD OF STUDY 2

4.3.1 Measurement

4.3.2 Data Collection

4.3.2.1 Survey Administration Procedure

4.3.2.2 Survey response and Representativeness

4.3.2.3 Demographic Statistics

## 4.4 CASE METHOD OF STUDY 3

4.4.1 Quantitative Survey Method

4.4.1.1 Objectives

4.4.1.2 Quantitative Data Collection

4.4.2 Qualitative Interviews Method

4.4.2.1 Measurements of IT Functionality

4.4.2.2 Coding Scheme

4.4.2.3 Qualitative Data Collection

## 4.5 ANALYSIS TECHNIQUES

4.5.1 Quantitative Analysis Techniques

4.5.2 Qualitative Analysis Techniques

## 4.6 CHAPTER SUMMARY
CHAPTER 6 ................................................................. 126
STUDY 3: CASE STUDY..................................................... 126
6.1 CASE BACKGROUND ...................................................... 126
6.1.1 Background of Anhui State Grid Corporation .................. 126
6.1.2 Background of KMS Under Study ................................. 127
6.1.3 Knowledge Sharing Process in KMS .............................. 128
6.1.4 KM Technology Applied in Knowledge Management Systems .... 131
6.1.5 Reward Systems Applied for Supporting Knowledge Sharing ........ 134
6.2 QUANTITATIVE STUDY .................................................. 136
6.2.1 Objectives .................................................................... 136
6.2.2 Results ......................................................................... 137
6.2.2.1 Descriptive Analysis .................................................. 137
6.2.2.2 Measurement Analysis .............................................. 138
6.2.2.3 Hypothesis Testing .................................................... 140
6.3 QUALITATIVE STUDY ..................................................... 145
6.3.1 Objectives .................................................................... 145
6.3.2 Interview Results ........................................................ 146
6.4 CHAPTER SUMMARY .................................................... 152

CHAPTER 7 ............................................................................. 153
DISCUSSION ........................................................................... 153
7.1 DISCUSSION OF RESULTS ............................................ 153
7.1.1 Discussion of Results on Each Study ............................ 154
7.1.1.1 Discussion of Results on Study 1...................................................... 154
7.1.1.2 Discussion of Results on Study 2...................................................... 157
7.1.1.3 Discussion of Results on Study 3...................................................... 159
7.1.2 Discussion of Cross Organizational Studies (Study 2 vs. Study 3)....... 163
7.1.3 Comparison of Quantitative and Qualitative Results in Study 3 ........ 164
7.1.4 Impact of KM Technologies ................................................................. 167
  7.1.4.1 Impact of IT Functionalities on the Interaction Effect of EI and Reward
                                  ............................................................................................................. 167
  7.1.4.2 Designing KMS to be Associated with Effective Reward Systems.. 168

7.2 IMPLICATION OF RESULTS .................................................................. 169
  7.2.1 Implication for Theory ...................................................................... 169
  7.2.2 Implication for Methodology ............................................................. 171
  7.2.3 Implication for Practice ..................................................................... 171

7.3 THREATS TO VALIDITY & LIMITATIONS .......................................... 173
  7.3.1 Statistical Conclusion Validity ............................................................ 173
  7.3.2 Internal Validity ................................................................................. 174
  7.3.3 Construct Validity ............................................................................. 174
  7.3.4 External Validity ................................................................................ 175
  7.3.5 Summary of Limitations ................................................................... 176

7.4 DIRECTIONS FOR FUTURE RESEARCH ............................................. 177

7.5 CHAPTER SUMMARY............................................................................. 178

CHAPTER 8 ........................................................................................................ 180
CONCLUSION ..................................................................................................... 180

REFERENCES .................................................................................................... 184
APPENDIX A - STUDY 1 QUESTIONNAIRE .................................................. 198
APPENDIX B1 - STUDY 2 QUESTIONNAIRE (CHINESE VERSION) .......... 203
APPENDIX B2 - STUDY 2 QUESTIONNAIRE (ENGLISH VERSION) .......... 206
APPENDIX C1 - STUDY 3 QUESTIONNAIRE (CHINESE VERSION) .......... 209
APPENDIX C2 - STUDY 3 QUESTIONNAIRE (ENGLISH VERSION) .......... 212
APPENDIX D - STUDY 3 INTERVIEW WORKSHEET .................................... 215
LIST OF TABLES

Table 2.1 Factors Studied in KS .......................................................... 22
Table 2.2 Antecedents of Social Loafing ......................................... 40
Table 2.3 KM Technologies in KMS ................................................ 46
Table 2.4 KM Technology Classifications and Functionalities ....... 48
Table 4.1 Definitions of Constructs of Study 1 ................................. 77
Table 4.2 Survey Items of Study 1 .................................................... 78
Table 4.3 Result of Non-response Test of Study 1 ......................... 83
Table 4.4 Sample Demographics of Study 1 ................................. 83
Table 4.5 Definition of Constructs of Study 2 ............................... 86
Table 4.6 Survey Items of Study 2 ................................................... 87
Table 4.7 Result of Non-response Test of Study 2 ......................... 90
Table 4.8 Sample Demographics of Study 2 ................................ 91
Table 4.9 Result of Non-response Test of Study 3 ......................... 95
Table 4.10 Sample Demographics of Study 3 (Survey) ................. 96
Table 4.11 Characteristics of Departments of Study 3 (Survey) .... 97
Table 4.12 Classification for Coding of Interview Responses ....... 101
Table 4.13 Interview Profiles .......................................................... 103
Table 5.1 Descriptive Statistics of Study 1 ..................................... 109
Table 5.2 Reliability of Constructs of Study 1 ............................... 109
Table 5.3 Validity of Questions of Study 1 ..................................... 110
Table 5.4 Results of Hypotheses Tests of Study 1 ......................... 111
Table 5.5 Descriptive Statistics of Study 2 ..................................... 117
Table 5.6 Reliability of Constructs of Study 2 ............................... 118
Table 5.7 Factor Analysis Results of Study 2 ............................... 119
Table 5.8 Results of Hierarchical Multiple Regression of Study 2 .... 120
Table 6.1 Knowledge Category in KMS of Case Company .......... 129
Table 6.2 KMS Profiles in ASG (XC) ............................................. 132
Table 6.3 IT Functionalities in KMS of ASG (XC) ......................... 133
Table 6.4 Descriptive Statistics of Study 3 (Quantitative Survey) .... 138
Table 6.5 Reliability of Constructs of Study 3 (Quantitative Survey) 138
Table 6.6 Factor Analysis Results of Study 3 (Quantitative Survey) 139
Table 6.7 Results of Hierarchical Multiple Regression of Study 3 (Quantitative) 141
Table 6.8 Summary of Three-way Interaction Effects of Study 3 (Quantitative).... 145
Table 6.9 Summarized Results of Study 3 (Qualitative Interview) ......................... 148
Table 6.10 Frequencies of Relationships of Study 3 (Qualitative Interview)......... 150
LIST OF FIGURES

Figure 2. 1 KS Dynamics in KMS ................................................................. 17
Figure 2. 2 KS Process in KMS ................................................................. 18
Figure 2. 3 Types of KS Dilemmas in KMS ................................................. 19
Figure 3. 1 Interactions between Social and Technical System .................. 53
Figure 3. 2 Research Approach of Dissertation ....................................... 56
Figure 3. 3 Research Model of Study 1 ...................................................... 61
Figure 3. 4 Research Model of Study 2 ...................................................... 65
Figure 3. 5 Quantitative Research Model of Study 3 ................................. 67
Figure 3. 6 Qualitative Research Model of Study 3 ................................. 69
Figure 5. 1 The Results of Hypotheses Tests .............................................. 112
Figure 5. 2 Two-way Interaction Patterns .................................................. 114
Figure 5. 3 The Results of Hypotheses Tests of Study 2 ............................ 121
Figure 5. 4 Two-way Interaction Patterns of Study 2 ............................... 122
Figure 5. 5 Three-way Interaction Patterns .............................................. 123
Figure 6. 1 Structure of ASG (XC) .............................................................. 127
Figure 6. 2 Knowledge Sharing Process of KMS in Case Company ............ 131
Figure 6. 3 KM Technologies Applied in Knowledge Sharing Process of ASG(XC) ................................................................. 134
Figure 6. 4 The Results of Hypotheses Tests of Study 3 (Quantitative Survey) ..... 141
Figure 6. 5 Two-way ............................................................................. 143
Figure 6. 6 Three-way Interaction Patterns of Study 3 (Quantitative) .......... 144
Figure 7. 1 The Impact of IT on Interaction Effects of EI and Reward ........... 168