How reward, computer self-efficacy, and perceived power security affect KMS success: an empirical investigation in high-tech companies

Lai*, J.-Y. (In press) How reward, computer self-efficacy, and perceived power security affect KMS success: An empirical investigation in high-tech companies. Journal of the American Society for Information Science and Technology, doi:10.1002/asi.20982. (Accepted)

Jung-Yu Lai, Ph.D.
Institute of Electronic Commerce
National Chung Hsing University
January 9, 2009, PhD forum of NTU-IM

Outline

- Introduction
- Theoretical Background
- Research Methodology
- Data Analysis and Results
- Discussion
- Conclusions

Introduction

- Devote more attentions on extrinsic (reward) and intrinsic (power) organizational factors that will affect the outcome of the implementation of KMS or information and communication technologies (ICTs) (Avgerou & McGrath, 2007; Bock et al., 2005; Kulkarni et al., 2006)
  - Reward may also be a crucial factor affecting KMS success

- Backler *et al.* (1998) point out that the relationships among culture, knowledge, and power are impossible to disentangle

Introduction

- Employees normally regard their unique knowledge as power to secure their positions in the organization (Ba et al., 2001; Huber, 1982; Zack, 1999)
  - Power concerns may also be a crucial factor affecting KMS success

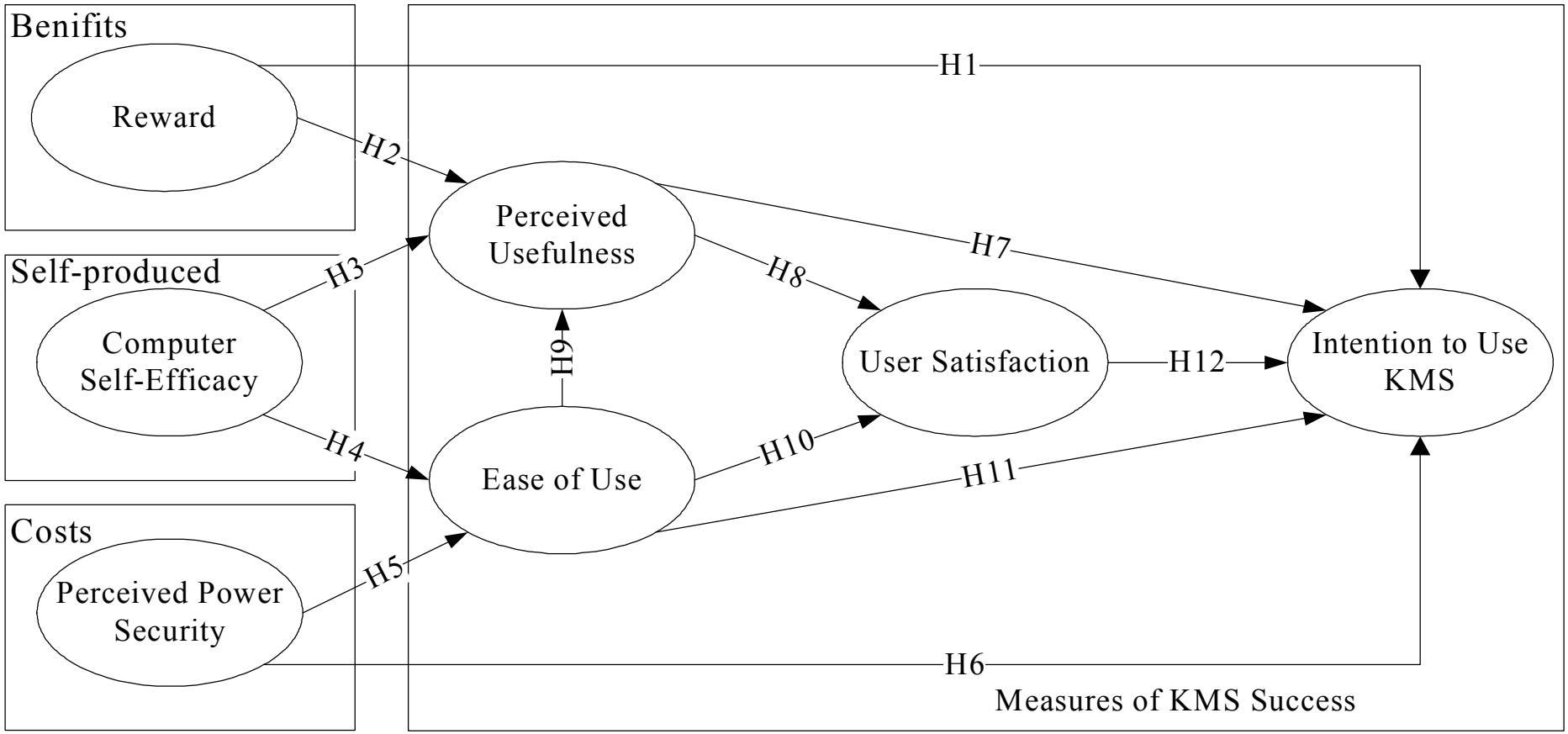
- Attitude and behavior an employee are influenced by the self-produced factors as well as the benefits and costs stimuli. Among these factors, none is more central than the so-called “self-efficacy” (Bock & Kim, 2002)
  - This paper includes benefits and costs factors such as reward and power relations security as well as computer self-efficacy into the proposed model and explores how they affect KMS success

Introduction

- Information Systems Success Model, first developed by DeLone and McLean (D&M) (1992)
  - Prior studies have successfully transformed D&M IS Success Model into KMS success model (Jennex, 2008; Jennex & Olfman, 2006; Kulkarni et al., 2006; Wu & Wang, 2006)
  - It's appropriately applied in measuring KMS success for this research

- A theoretical model derived from IS Success model was proposed for a better understanding of KMS success
  - Reward, computer self-efficacy, and perceived power security all significantly contribute to KMS success, either by direct effects or by indirect effects on user satisfaction and intention to use KMS through perceived usefulness and ease of use

Research Model



Research Methodology-Data Collection

- Data for this study were collected using a questionnaire survey administered in Hsin-Chu Science Industrial Park in Taiwan
  - Top-100 companies were included to form an initial sample pool
  - Internationalized semi-conductor & TFT–LCD manufacturing companies with KMS implemented were chosen
  - 6 initial phone calls were made for explaining the purpose of the research project and inquiring about their willingness to participate in the study were acknowledged
  - Sent out 200 questionnaires to the respondents and received 141 completed questionnaires

Data analysis and results- Analysis of reliability and validity

- Construct reliability and validity were established using confirmatory factor analysis (CFA), and convergent validity was evaluated for the refined model according to the three criteria recommended by Fornell and Larcker (1981)
  - All indicator factor loadings (λ) should be significant
  - Construct reliability in terms of composite reliability (CR), in which the internal consistency on the indicators measuring a given factor exceeding 0.80
  - Average variance extracted (AVE) from each construct should exceed 0.50
- The results show that the λ -values for all items are significant at $P \leq 0.05$

Data analysis and results-Analysis of nested difference tests

- Use the model-trimming approach (Fredricks & Dpssett, 1983)
  - Deletes two paths at a time when the significant chi-square difference indicates relatively large trimming
  - A significant chi-square difference indicates that the dropping paths denotes the fit of the simpler model being significantly worse than that for the more complex model

Data analysis and results-Analysis of causal model

- Reward has a significant positive effect on perceived usefulness (γ = 0.16, $P < 0.05$) and intention to use KMS (γ = 0.20, $P < 0.001$)
- Computer self-efficacy has a significant positive effect on both perceived usefulness (γ =0.28, $P < 0.05$) and ease of use (γ =0.61, $P <0.001$)
  - Perceived power security has a positive effect on both ease of use (γ = 0.15, $P < 0.05$) and intention to use KMS (γ = 0.22, $P < 0.01$)
  - Ease of use has the most significant effect on user satisfaction (β = 0.57, $P < 0.001$) and is a significant factor in determining perceived usefulness (β = 0.26, $P < 0.05$)
  - The direct effects of perceived usefulness, ease of use, and user satisfaction on intention to use KMS are 0.49 ($P < 0.001$), 0.08 ($P < 0.05$), and 0.18 ($P < 0.05$) respectively

Data analysis and results-Analysis of causal model

- Reward influences perceived usefulness and intention to use KMS in addition to showing slight total effects on user satisfaction (0.05)
- Computer self-efficacy is a strong reinforcer influencing the success of KMS, showing the second largest total effects on user satisfaction (0.49) and intention to use KMS (0.35)
- Perceived usefulness shows the strongest direct effect and total effects on intention to use KMS (0.55)

Discussion-Findings

- Previous research
  - Knowledge sharing occurs most likely when employees perceive that incentives exceed cost (Kelley & Thibaut, 1978)
  - Explicit rewards were effective in motivating employees to share their knowledge (Ewing & Keenan, 2001)
  - Kulkarni et al. (2006) prove that incentive significantly causes knowledge use and high knowledge content quality

Discussion-Findings

- This study
  - Reward has significant influence on perceived usefulness and intention to use KMS
  - Perceived power security is another important factor influencing employees' perceptions of ease of use and intention to use KMS
  - A success KMS system should ensure the employee's power security
  - KMS strategy cannot ignore the computer self-efficacy
  - Ease of use is one important factor affecting perceived usefulness, user satisfaction, and intention to use KMS

Table 6. Related findings on usage of EKR in recent empirical studies

	Kulkarni, Ravindran, & Freeze (2006)	Wu & Wang, (2006)	Kankanhalli, Tan, & Wei, (2005a)	Kankanhalli, Tan, & Wei, (2005b)	This study
1. Reward or incentives-> Usefulness or net benefits					supported
2.Reward or incentives-> Intention to use or usage of EKR			supported	supported	supported
3. Computer or knowledge self-efficacy-> Usefulness or net benefits					supported
4. Computer or knowledge self-efficacy-> Ease of use or system quality					supported
5.Power concerns-> Ease of use or system quality					supported
6. Power concerns-> Intention to use or usage of EKR			not supported		supported
7. Usefulness or net benefits-> User satisfaction	supported	supported			supported
8. Usefulness or net benefits-> Intention to use or usage of EKR	not supported	supported			supported
9. Ease of use or system quality-> Usefulness or net benefits	not supported	Not supported		Not supported	supported
10. Ease of use or system quality-> User satisfaction	supported	supported			supported
11. Ease of use or system quality-> Intention to use or usage of EKR					supported
12. User satisfaction-> Intention to use or usage	supported	supported			supported

Discussion- Implications for research and management

- Reward system perhaps created by human resource
  - Announced and emphasized by top authorities
  - Must be exactly executed by department managers
  - Each department must establish its own criteria for evaluating the quality of knowledge created by employees
- Bock et al. (2005) indicate that factors such as fairness underlying organizational climate will influence intention to share knowledge
  - Managers must view that knowledge sharing is everyone's work
  - Managers must guarantee that employees' power relations will not be changed

Discussion- Implications for research and management

- An employee with a higher level of computer self-efficacy will have a higher level of satisfaction through perceived usefulness and ease of use
  - Provide different training courses for employees depending on their skill levels
- Employees can increase personal competitive advantages through learning from useful knowledge
  - Let employees feel the usefulness of knowledge sharing in a job
- Unfriendly KMS
  - Complex applications , challenges, and dissatisfaction with KMS

Discussion- Limitations and future research

- Limitations
  - Generalize and apply our findings should be careful
  - Self-selection biases
  - Didn’t consider the role of different levels of skill play
  - Lee and Ahn (2007) propose that knowledge sharing increases under the individual-based reward with a higher level of perceived power security, trust, or care
- Future research
  - Financial and non-financial incentives
  - Explore the impacts of different types of rewards on perceived usefulness and intention to use KMS

Conclusions

- Knowledge management systems can be viewed as innovation system in firms
- Cannot ignore the factors such as reward and power relations change in addition to technology analyses
- This study throws more lights on factors affecting KMS success by combining factors of reward, computer self-efficacy, and perceived power security
- Help practitioners and researchers understand why employees resist KMS, predict how employees will respond to KMS, and increase employees' satisfaction and intention to use KMS by improving the techniques and processes by which they are implemented