

전자지급결제에서의 지식관리 전략: 지식공유 관점

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Knowledge management strategy in the electronic payment domain: perspective on knowledge sharing

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요 약

지식관리 전략은 비즈니스 기회의 창출과 유지에 핵심적인 요소로 인식되고 있다. 본 연구의 목적은 전자지급결제 영역에서의 지식관리의 역할을 지식공유 관점에서 분석하고, 다양한 전자지급결제방식에 적합한 지식공유 전략을 제시하는 것이다. 이를 위하여 전자지급결제의 특성을 결정짓는 2가지 요소인 신뢰성과 효율성을 기반으로 지식관리-전자지급결제 분류모형을 제시하고, 각 영역에 적합한 지식공유 전략을 도출하였다. 연구의 결과에서 전자지급결제 특성과 지식공유 전략의 정합성이 전자지급결제 영역의 거래 당사자간의 관계 결속을 증가시키고 거래 과정을 최적화 시킬 수 있음을 제시하였다.

Abstract

Knowledge management strategy has become a one of the most important factors creating and maintaining the business opportunities. In this paper, I present a KM-ePAY typology to investigate the role of knowledge sharing strategy in the electronic payment domain. Specifically, I examine the characteristics of four types of electronic payment systems based on the confidence and efficiency that characterize the feature of electronic payment media and identify appropriate knowledge sharing approaches for each component. In conclusion, my findings indicate that knowledge sharing approaches which are align with the characteristics of electronic payment give a way both to increase relationship commitment and to optimize process over electronic payment transactions.

▶ Keyword : 지식관리(Knowledge management), 지식공유(Knowledge sharing), 전자지급결제(Electronic payment), 정합성(Alignment), 인터넷(Internet), 정보기술(Information technology)

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I. Introduction

Internet is becoming an essential factor for providing new business opportunities. This is of particular relevance for electronic payment mechanism that is becoming increasingly important for electronic commerce. The various types of electronic payment system have been proposed due to the development of information technologies and explosion of Internet.

In contrast to the traditional electronic payment media, the rising ones are closely related to the merchant's royalty coupons and gradually evolved into the real electronic payment media. These evolving coupons are different from the traditional electronic payment media since they may be circulated largely based on the trust recognition which comes from the relationship commitment between payer and payee. In order to increase business performance, appropriate management and strategies for encouraging engagement and participation at the electronic payment transaction should be applied on the payment process.

The traditional payment media are also confronted with several problems in their settlement as a consequence of the lack of adequate capability. Meeting these challenges, especially to the trust aspects and security requirements, occasionally results in the failure to provide stakeholders with accurate transaction. Therefore, a careful classification of types of electronic payment scheme is needed to apply appropriate strategy to transaction management. However, to my knowledge there have been few research on the management practices related to the electronic payment systems.

To apply appropriate knowledge management strategy, Drew [1] have suggested the concept of a knowledge portfolio which is comprised of knowledge sharing, knowledge creation and seeking, uncovering hidden knowledge, and discovering key risk and opportunities based on the two dimensions such as

knowledge content and knowledge awareness. In this paper knowledge management strategy, especially focusing on knowledge sharing is used for developing an appropriate strategy in several kinds of electronic payment scheme. The objective of this paper is to investigate the role of knowledge sharing for gaining the successful electronic payment transaction. More precisely, I classify electronic payment scheme according to the two dimensions such as confidence and efficiency that characterize feature of electronic payment media and present a KM-ePAY typology with a suggestion for improving electronic payment systems.

I begin with a brief outline of the rationale of the study including research objective. The following section will discuss a review of the relevant literature on knowledge management and electronic payment. Next, I present a KM-ePAY typology and identify appropriate knowledge sharing approaches. In the final section I summarize my findings and discuss areas for future research.

II. Related Works

1. Knowledge management and business process

Knowledge Management is a key aspect of any organization to build and sustain competitive advantages [2]. Knowledge management is defined as a planned, structured approach to manage the creation, sharing, harvesting and leveraging of knowledge as an organizational asset, to enhance a company's ability, speed and effectiveness in delivering products or services for the benefit of clients in line with its business strategy [3].

Knowledge management is clearly distinguished from information management due to the nature of scope of available knowledge that exists at organization. Johannessen et al. [4] argue that knowledge can be classified into four categories such as tacit knowledge, explicit knowledge,

relationship knowledge, and systemic knowledge.

There are several reasons for a company to manage knowledge as organizational assets. Previous research suggests that knowledge management may play a significant role in reducing duplication of efforts, creating of new knowledge, and increasing efficiency and productivity [5]. Another important contribution that knowledge management makes to organization is to enable sustainable competitive advantage especially in hyper-competitive environments [6, 7].

Furthermore, knowledge management leads to intuitive sense that the organization that knows more about its customers, products, technologies, and markets [8]. Knowledge management is particularly relevant for understanding customer needs. Home et al. [9] argue that effective knowledge management practices will reduce costs and increase levels of customer service.

In the organizational and informational literature, knowledge management has been studied in a wide variety of contexts. However, research on the knowledge management has concentrated on how these activities give benefits to the organizational business process. Knowledge management process is a key criterion for understanding the role of knowledge management in organization. Knowledge value chain refers to the flow of knowledge through a sequence of process in which its value is increased at each stage such as knowledge creation, knowledge use, knowledge management, and knowledge preservation [10].

Knowledge management must be understood from a business process point of view. Raghu and Vinze [11] explore the relationship between business process and knowledge context and present the business process context for knowledge management as shown in Figure 1. In this diagram, they argue that four key aspects such as workflow execution, information processing, decision making, and motivation structure form the knowledge contexts kernel and interact among each other and

with knowledge management process for acquiring operational core of knowledge.

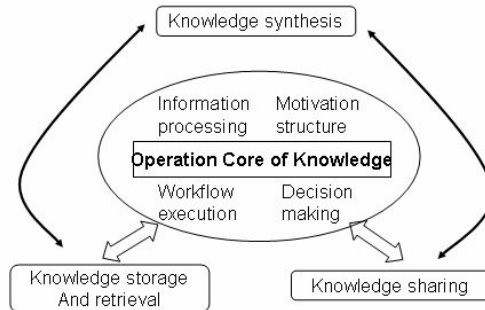


Fig. 1. The business process context for knowledge management [11]
 그림 1. 지식관리를 위한 비즈니스 프로세스 [11]

Developing an operational core of knowledge can be constructed with a knowledge management process, namely facets of knowledge management, such as knowledge storage and retrieval, knowledge sharing, and knowledge synthesis. As is evident from this research, core of knowledge comes from knowledge process and is closely related to the business process of specific domain.

2. Electronic payment

Electronic Payment System Observatory (EPSO) defines that electronic payment is the transfer of an electronic means of payment from the payer to the payee through the use of an electronic payment instrument. The electronic payment process takes place via the Internet between three participants such as client, merchant and bank. In order to accomplish the well defined payment cycle, a payment process should be conducted based on trust and security [12].

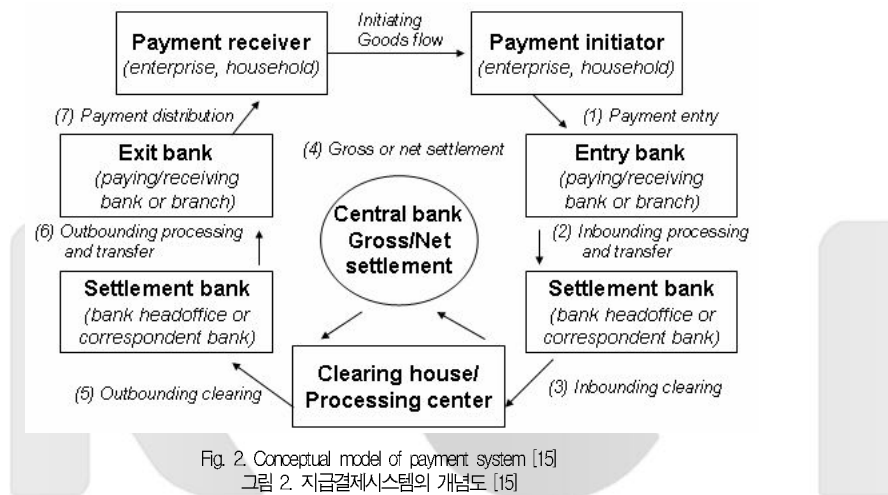
Tsiakis and Stephanides [12] argue that a trusted environment is characterized by: (1) the fact that all entities are uniquely identifiable; (2) that there is a minimum number of a priori trusted entities; and (3) that these entities have unquestionable trust to other participating entities. Furthermore, they classified security in electronic

payment domain into three areas: (1) system security refers to the technical infrastructure and implementation; (2) transaction security refers to the secure payment according to specific and well defined rules; and (3) legal security refers to a legal frame for electronic payment.

Trust and security problems are closely related to the two fundamental elements of payment media such as confidence and efficiency. Confidence means the degree of money's performance in terms of basic monetary functions and the degree of the money's public acceptance. Confidence of payment

media is determined by customer trust acquired through market competition [13]. The efficient payment system defined as a system that settles payments quickly, safely and at reasonable cost [14].

Khiaonarong [15] present the conceptual model of typical payment cycle as shown in Figure 2. He argues that the most important role of payment systems is to provide the financial market promptness and certainty in the payment and settlement of borrowed and invested funds.



There are several distinctive features to classify electronic payment scheme such as the payment protocol model, the time that monetary value is transferred, and payment amount [16]. For example, the electronic payment can be categorized into three types such as micro payments, small payments, and macro payments based on the payment amount through market transaction. In addition, there are three payment protocol models such as cash (or tokens), cheque, and cards.

Various types of new electronic payment scheme have emerged with development of information technologies. The development of electronic payment scheme has to be built upon on

a through understanding of explosion of Internet and development of information technologies. There are two major important factors which result in recent reforms of payment systems such as the deregulation of world financial market and computerization of work process in banking.

Due to the information technologies, electronic payment scheme is becoming more flexible, blurring the boundaries between traditional and new ones. The rising payment media including royalty coupons and Internet portal cash are exchanged between payer and payee based on the trust recognition. To properly circulate these coupons over payment cycle, all participants,

especially to payee, need to design and implement the more competitive strategy with regarding to its trust and security problems.

III. Methodology

In this study, qualitative methodology largely inspired by Benbaset et al. [17] was used because it is very effective in exploring rising and not-matured matters, such as a rising new electronic payment scheme. Based on this, conceptual study mainly based on ideas, structures and speculations rather than on the systematic and direct observation of reality was added for presenting KM-ePAY typology.

This typology composed of the two dimensions such as confidence and efficiency is designed based on the following concepts. First, both confidence and efficiency play a key role in the definition of characteristics of electronic payment system [13, 14]. In addition, these are also important factors enabling settlement of payment system by enhancing the capability of payment media. Second, the acquirement of both confidence and efficiency is mainly relying on the structure of electronic payment system, which provide trusted and security environment [12].

The unit of analysis has been focused on the both traditional and rising electronic payment scheme including general electronic payment method and coupon based electronic payment.

The two data sources such as in-depth interviews and archival documents were used. Four interviews were conducted with the following individuals: three payment industry experts of the Pontbanking.com (<http://www.pointbanking.com>) and OK cashbag.com (<http://www.okcashbag.com>) and a financial consultant of the Hana bank (<http://www.hanabank.co.kr>). These interviews were conducted two times throughout year 2005 to check accuracy and consistency. Interviewees were asked to assess the

performance of payment mechanism in terms of knowledge sharing. In addition, published documents and other literature related to the electronic payment mechanism generated by the financial consultants were thoroughly reviewed.

The research analysis in the following steps aims to show how knowledge management strategy can be applied for various types of electronic payment scheme. First, I identify the four category of electronic payment scheme based on the degree of confidence and efficiency which are two critical factors of characterizing payment media through payment cycle. Second, I highlight the role of trust and security which allow increasing the degree of confidence and efficiency respectively. Third, the analysis of the correlation between knowledge management strategy and the type of electronic payment is conducted to explore potential benefits which are relevant to the trust and security problems. Finally, I identify the critical knowledge management factors which should be applied on the electronic payment mechanism to improve the confidence and efficiency.

IV. Knowledge Based Electronic Payment Approaches

It is clear that the two key important factors for electronic payment are confidence and efficiency in payment transaction. As indicated before, a good combination of confidence and efficiency in electronic payment is essential element in order to avoid the classical problems of having a poor transaction scheme between stakeholders. This means that knowledge management strategy must be able to apply managing confidence and efficiency in electronic payment transaction.

To classify knowledge management approaches I propose several classification criteria. In accordance to previous research, I present following model

categories: Royalty oriented trust focusing (ROT), Market oriented trust focusing (MOT), Technology oriented security focusing (TOS), and Market oriented security focusing (MOS) as shown in Figure 3.

In this typology, the concept of both trust and security are added for elaborating four components based on the two dimensions such as confidence and efficiency. The level of confidence and efficiency is used to identify the types of electronic payment system emerging from the traditional and rising payment transaction. I note that the level of confidence is a crucial factor affecting the settlement of payment system through building trust and security. Another important factor is an efficiency which is concerned with making market or individual performance of payment media. Thus, the knowledge management target of electronic payment settlement across the payment transaction should be focused on the recognition of trust and security with a attitude towards a whole market performance starting from individual performance such as royalty and technology manner.

| | | | |
|------------|------|---------------------------------|---------------------------------------|
| Efficiency | High | Market-oriented trust focusing | Market-oriented security focusing |
| | Low | Royalty-oriented trust focusing | Technology-oriented security focusing |
| | | Low | High |
| | | Confidence | |

Fig. 3. A proposed KM-ePAY typology
 그림 3. 지식관리-전자지급결제 분류모형도

This presented classification focuses on the development and applying of specific knowledge management strategies to accomplish the goals of the each payment scheme.

1. Royalty oriented trust focusing (ROT)

Payment process in this category can be initiated and completed regardless of the way the confidence and efficiency is generated and used. An electronic payment transaction process can be managed using the basic knowledge management, especially focused on knowledge sharing strategy between the payer and payee in this category.

Knowledge sharing networks management enables payer to validate payee's trust potential, helping to increase access to information about payee's ability for guarantying own electronic payment media such as tokens and coupons, etc. By using the knowledge sharing capabilities the payer can understand better what transaction media is more available in order to acquire real value through electronic payment transaction.

The knowledge and information concerning the payee's trustiness, guarantying ability, and transaction process should be available and shared even to those who are not participated at this payment process for increasing royalty to the payee. The payee is basically confronted with the problems associated with royalty promotion caused by the relationships between stakeholders. This relationship will be reinforced with providing a more guaranteed value, supplying more guaranteed tokens over transaction process.

2. Market oriented trust focusing (MOT)

In order to increase the confidence of payment media in this category, market trust should be emphasized through transaction. These tasks and problems can be solved by increasing both payment media's performance and acceptability. The most important component of performance is function of media of exchange that enables trust based payment transaction. This is achieved by using knowledge sharing approaches combined with trust recognition in market. In regard to trust recognition, knowledge management should

facilitate the accessibility of knowledge on the issues payee's management activities, financial structure, and value-added services.

To identify which payee can be considered as a reliable partner, it is necessary for payer to understand the characteristics of payment media of this category. According to these findings, it is possible to define reliable payee and future development of payment media for continuous use. Generally the market trust is based on the relationships between payer, payee, and bank which are three key elements of payment transaction system. This relationship is the key success factor in particular for the involvement of payer with a very reasonable attitude towards trust sharing.

For this purpose the added value based on the relationship commitment as a practical payment media should be given, so that the payer involved in market transaction can find the motivation for using this payment media. Knowledge sharing allows a better understanding for the benefits from this transaction which provides both incentive and payment media's function as an added value for payer.

3. Technology oriented security focusing (TOS)

From the payer point of view, they could be provided with the opportunity to acquire high confidence by using payment media in this category. The confidence opened for payer is relatively higher in this category when compare to other components. This means that the knowledge sharing approach must be able to apply and improve the acquired efficiency through a payment transaction. Efficiency is strongly related with the settlement of payment process quickly and safely at a reasonable cost.

The main purpose of adapting knowledge sharing strategy in this category is to make a difference in the nature of the security process among the stakeholders as it would change the

way they settles their whole payment process by optimizing payment structure. The knowledge sharing focused on the optimization among the stakeholders facilitates the exchange of information and coordination of payment process for solving sophisticated security mechanisms. Effective knowledge sharing approaches enable payers to validate a structure of payment process quickly, helping to reduce fraudulent orders in electronic payment. Furthermore, this optimization eliminates the possibility of entering wrong payment data supplied by the third party.

An important guideline for the efficient payment transaction is set by the knowledge sharing approach integral to the payee's optimization strategy, which includes technical operation. Developing integrated approaches to secure payment cycle for efficient transaction including well developed payment scheme, which provides increased transaction with payee are the main goal of knowledge sharing in this category. Moreover, particular attention can be paid to the transaction cost of the payment scheme and related operations. In doing this, the cost of circulation of payment media over full payment mechanism has to be considered when modifying present solutions and developing new payment scheme.

4. Market oriented security focusing (MOS)

An electronic payment media in this category require both high level of confidence and high degree of efficiency throughout circulation process. A major need is to better understand the barriers to keep both level of confidence and efficiency, and to develop appropriate solutions by using knowledge sharing approaches. Knowledge sharing strategy should contribute to enrichment in the integration both relationship commitment and optimizing payment process between payer and payee and should be used to prevent several kinds of problems including miscommunications

and technical errors.

The focus of knowledge sharing is on delivering new payment channel and payer's value that fit the payer's emotional and technical requirements. This role may require additional expenses and strategic changes in the way that stakeholders do their business based on the knowledge management. The most advanced payment media as shown in this category is closely related to the exploiting the opportunities offered through knowledge sharing management which provides customized solutions that carefully match customer's needs.

The knowledge interactions that take place in this category are initiated and promoted by the both payer and payee, who are basically connect the knowledge management system exploiting the storage, sharing, and retrieval capabilities.

V. Conclusions

This paper has discussed some critical issues related to the knowledge sharing approaches, and in particular electronic payment domain. Electronic payments are particularly important parts which contain the means to make it possible for stakeholders to exchange confidential information through electronic commerce. More proper strategy is needed in order to enable the stakeholders to accomplish transactions with the recent developments of various types of electronic payment scheme.

One of the most important tasks related to this strategy is the design and implementation of knowledge sharing. The reason is that knowledge sharing for electronic payment improves the communications between payer and payee and increases process efficiency by using knowledge management tool. Thus, electronic payment mechanism should be carefully designed and implemented using both proper technologies and strategies based on the knowledge sharing

approaches.

In this paper I have combined insights from theories of knowledge management and electronic payment to sketch the role of knowledge sharing in electronic payment domain. This study of the KM-ePAY typology revealed that the knowledge sharing approaches in electronic payment domain have a significant effect on the electronic payment transactions. Especially, this paper illustrates the successful factors of electronic payment transaction that integrates knowledge sharing approaches and electronic payment mechanism. I found that knowledge sharing approaches give the opportunities to improve quality of payment transaction in two very significant ways.

First, it increased the relationship commitment by making it easier for stakeholders to have a more active involvement in the electronic payment cycle. An active involvement may come from the higher awareness of the benefits and trust recognition through knowledge based electronic payment approaches. Knowledge sharing serves a crucial role for validating a payee's ability related to the confidence of payment media which is circulated based on the trust recognition.

Second, it served as a guideline to determine the important factors for optimizing payment process. A concept of knowledge sharing successfully applied to the process optimization has an important role to play towards the establishment of efficient payment systems. Activities emerged from the knowledge sharing in optimizing process include several types of benefits such as low cost, high security and low risks. This is because well applied knowledge management approaches better suited for the electronic payment transaction.

Due to the characteristics of electronic payment service, increasing confidence and efficiency is a critical issue. I have examined the links between knowledge sharing approaches and electronic payment practice by presenting the KM-ePAY

typology which covers some appropriate strategies in each component. Although previous studies have shown that knowledge sharing management has been an important factor contributing to the performance of organization, few studies included specific domain such as electronic payment transaction.

In my knowledge, this study is the first step towards the establishing of knowledge based electronic payment process, especially when dealing with issues concerning rising various types of electronic payment media which are heavily drawn by Internet and information technologies. I have also provided the rich descriptions of the characteristics of the electronic payment media in each component and the requirements for knowledge sharing approaches.

By doing this, I have identified the relationship between the settlement of the new payment media in market transaction and knowledge sharing approaches as an enabler. This is a quite early work on the knowledge based electronic payment approaches. Nevertheless, I believe that the implications are important for expanding knowledge management research scope, and give a solution to an electronic payment implementation. Future research should address limitations of this study such as designing depth case studies and conducting more feasibility analysis. In addition, a more complete understanding of knowledge sharing as an enabler of the settlement and development of electronic payment transaction might go along way towards improving my understandings.

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