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The Relationship between Knowledge Management Strategy and Information Technology Strategy

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***Abstract*—**Recently, a great number of theoretical frameworks have been proposed to develop the linkages between knowledge management (KM) and organizational strategies. However, while there has been much theorizing and case study in the area, validated research models integrating KM and information technology strategies for empirical testing of these theories have been scarce. In this research, we try to develop a research model for explaining the relationship between KM strategy and IT strategy and their effects on performance. Finally, meaningful propositions and conclusions are derived, and suggestions for future research are proposed and discussed.

***Keywords*—**Knowledge management strategy, information technology strategy, knowledge management performance, information technology performance

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I. Introduction

In the unpredictable and turbulent business environment, even large, successful organizations are facing severe challenges in the global environment. Executives who don't closely monitor changes in their circumstance and don't take the specific characteristics of complementary resources into considerations as they plan, organize, apply, and control are likely to struggle to achieve sustainable competitive advantage. Therefore, it is critical for business to discern what kinds of skills or capabilities they owned and, further, how to create the resources that are valuable, rare, and difficult to imitate or substitute [6], [7]. In this vein, integrating the firms' various kinds of advantaged weapons that are costly-to-copy as a whole is seen as the fundamental driver of performance [7], [15], [20], [49].

Drucker [20] argues that knowledge is a significant resource, more important than other assets (e.g., land, capital and labor, etc.) in the post-capitalist society. He also indicates that with the growth of knowledge work in the developed economies, the proportion of knowledge workers in the workforce is increasing, thus making the productivity of knowledge workers form a basis for economic growth. In the new era of complicating and rapidly changing business environment, therefore, Knowledge management (KM) is regarded as pressing issues in contemporary business, as corporations have found that knowledge is the organizational critical asset and potential strategic resource that gives a basis for competitive advantage [2], [18], [24]. More specifically, the implementation of KM projects compliant with various KM strategies would provide organizations dynamic capabilities of improving knowledge quality and quantity as well as consolidating the value and practicability of knowledge [26], [30], [31], [36].

Recently, both researchers and practitioners have started to realize the importance of the information technology (IT) for effective KM activities [3], [12], [32] or interorganizational learning facilitating [50]. It is found that an organization which has high quality in both KM and IT will achieve high KM performance and satisfaction more frequently than those whose quality fitted low [34], [51]. That is, effective KM project alone can't lead to success without the support of IT [35], [45], [56]. Accordingly, the high relationship between KM and IT in managing business activities must be considered for business performance [5], [63]. In other words, it is critical and necessary for a firm to choose the right IT salutations in KM activities [35]. In a more practical perspective of how knowledge management may be implemented stated by Hendriks and Vriens [29], three objectives or problems into goals and measures for knowledge management can be found, they are: the organizational measures, the humane resources management measures, and the technical measures. These three descriptions have been viewed as feasible measures or means for KM effectiveness [19], [58], [59]. Therefore, a linkage of effective IT strategy and KM strategy is the key to reduce costs, which in turn, a higher performance achieved [18], [33], [55].

In the practical terms, the basic alignment mechanism is "strategy" [40], and it is though that a match between strategy and organization is the key driven to effectiveness at realizing intended strategies [25]. Therefore, this study focused on providing empirical evidence of the relationship between knowledge management (KM) strategy and information technology (IT) strategy. We posit that performance variables including business performance, KM performance, and IT performance are affected by these two strategies respectively.

II. Theoretical Background and Hypotheses

A. KM strategy and KM performance (H1, H2 and H3)

Since knowledge has been regarded as a strategic resource for organizations [1], [12], [16], [36], it is important to know

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how to effectively manage other resources (e.g., people, process, IT) to comply with knowledge. KM strategy is the right tool to determine how to employ these various resources to enhance knowledge quantity and quality, thus, are regarded as the facilitators for KM outcomes [9], [26], [53], [54], [61].

Various KM strategies development are classified by the nature of knowledge itself, e.g., explicit or tacit [43], [49], [52]. Explicit knowledge refers to transfer information in a systematized manner, whereas tacit knowledge refers to transfer information through social networks among employees. These two concepts are similar to that of Hansen et al.'s [26] classification for KM strategy as "codification strategy" which is also called "system strategy" and "personalization strategy" which is also called "human strategy" respectively. While codification strategy of KM adopted, it seeks to retrieve and store knowledge in explicit form (e.g., in information systems or databases) that can be easily transferred and reused by individuals in an organization. The personalization strategy of KM, on the other hand, seeks to capture and share tacit knowledge that resides in human minds, behavior, and perception. It evolves from person-to-person interact extensively to obtain knowledge. In other words, various IT strategies for firms must to support for the adoption of different KM strategies.

The rapid progress of IT provides a good solution to answer the question: why does a KM project alone not always lead to enhanced business performance when firms overlook its links to other resources? That is, firms with excellent IT capabilities allow them to cope with the present competitive and dynamic environment well [11]. Accordingly, strategic IT management has been regarded an enabler in business performance, when it fits with certain aspects of the KM context, helping companies to survive in the highly-competitive business environment [3].

Choosing the right ITs for different KM strategies is critical for organizations [35]. Effective KM activities require employing KM strategies, as well as IT, appropriately [38]. Using various IT solutions to comply with KM strategy will contribute to the creation of corporate knowledge directories, via knowledge mapping or the building of knowledge networks [57]. Therefore, the relationship between KM strategy and IT strategy is highly relevant [22]. Meanwhile, according to the arguments presented by Asoh [5], as an enabler for KM and IM/IS, IT strategy serves as the delivery-oriented component (Earl, 1989) that must be aligned with KM strategy to improve both KM and organizational performance.

IT strategies can be classified into two general categories: IT environment scanning; and strategic use of IT [10]. System KM strategy requires IT tools that allow for explicit knowledge to be formalized and articulated in documents, and shared electronically through IT infrastructures such as intranets [50]. In this manner, organizations should invest in an extensive IT system to codify knowledge. Therefore, a firm's IT strategy should focus on paying more attentions to strategic use of IT internally, in order to improve the quality and quantity of electronic repositories or databases. In contrast, human KM strategy draws upon interpersonal relationships to exchange and share tacit knowledge across the organization. Thus, firms need a moderate investment in IT to connect experts in the organization. The technologies may include an e-mail system, on-line discussion networks, videoconferencing, and other collaborative tools [48]. A firm's IT strategy, therefore, should aim at scanning the external IT environment, searching for communication tools and other interactive technologies to support person-to-person knowledge-sharing.

Accordingly, a right IT strategy used will depend upon what KM strategy an organization employed. Hence, the following proposition is proposed:

P1: KM strategy has a positive direct effect on IT strategy

According to the perspectives of explicit-oriented and tacit-oriented, Choi and Lee [13] classified KM methods into four styles, labeled dynamic, system-oriented, human-oriented, and passive. After empirical test from 54 Korean firms in the manufacturing, service, and financial industries, they indicate that dynamic style integrating explicit-oriented with tacit-oriented methods is found to have a significant impact on performance. On the case study of 31 different KM projects in 23 countries, Davenport and Prusak [18] propose a four KM projects typology, namely knowledge repositories, knowledge access, knowledge environment, and knowledge assets. They further manifest the factors that lead to successful KM projects, including knowledge-oriented culture, technical and organizational infrastructure, senior management support, clarity of vision and language, linking KM to economic benefits, nontrivial motivational aids, multiple channels for knowledge transfer, and the level of knowledge structure. In sum, much evidences have been proved that develop a KM strategy provides a valuable opportunity to obtain a greater understanding of the way a business operates to foster their KM practices to success[23], [45]. Consequently, the following proposition is proposed:

P2: KM strategy has a positive direct effect on KM performance

It has been realized that successful KM projects will lead to overall organizational performance [4], [18]. However, such linkage is indefinite and difficult to validate clearly[60]. That is, it means that there is still an unexplored evidence to prove the direct relationship between knowledge-related antecedents and organizational performance, since lots of factors may contribution to the organizational performance [37], [42]. As Lee and Choi [37] describe "this incorporation may help confirm that enablers ultimately create business value." (p. 182). Thus, an intermediate outcome (e.g., knowledge quality, user knowledge satisfaction, or organizational creativity) may be introduced as a mediator in the causal relationship [37], [60].

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P3: KM performance has a positive direct effect on business performance

B. IT strategy and IT performance (H4, H5, and H6)

IT strategy is concerned with technology policies including questions of architecture, security levels, etc. [21]. In Henderson and Venkatraman's strategic alignment model [27], [28], IT strategy involves three components that should be articulated in terms of internal and external domains: information technology scope, systemic competencies, and IT governance. In the perspective of information-processing requirements, IT strategy has been conceptualized as a four-dimensional construct, namely competencies, role of IT, systems design and development, and infrastructures [17]. According to Bergeron et al. [10], two dimensions are identified within IT strategy, the first one is IT environment scanning, representing the capability of a firm to detect and react to external changes in technology; the second one is strategic use of IT, representing what extent a firm used IT to increase product quality and performance.

Numerous of successful stories involving strategic utilization of IT have been described in the literature [46]. While many researchers have indicated that IT has a significant positive direct effect on organizational outcome, however, enough of exceptions have been argued to contest with the argumentation [8], [14], [39], [44]. This premise is similar to the influential processes of KM process-KM intermediate outcome-organizational performance aforementioned. As Henderson and Venkatraman [27] contend "Indeed, the key strategic IT management challenge lies in the identification of those strategic dimensions that require modification under different contingencies for enhancing organizational performance". It means that IT strategy should be aligned with its business strategy or other meaningful activities, thus, the direct maximum effectiveness for organizations can be achieved, or the performance would be formed by an indirect effect form IT strategy to business performance through IT outcome.

P4: IT strategy has a positive direct effect on IT performance

P5: IT performance has a positive direct effect on business performance

Furthermore, numerous of studies have pointed out that suitable or successful IT implementations are enablers for effective KM activities [3], [12], [32], [41], [62]. It means that for achieving KM performance requires IT deployment well to enhance the KM outcome [38]. Thus, the following proposition is also proposed:

P6: IT performance has a positive direct effect on KM performance

Collectively, according to the discussion aforementioned, our research model is proposed as Fig.1, including five constructs and six propositions.

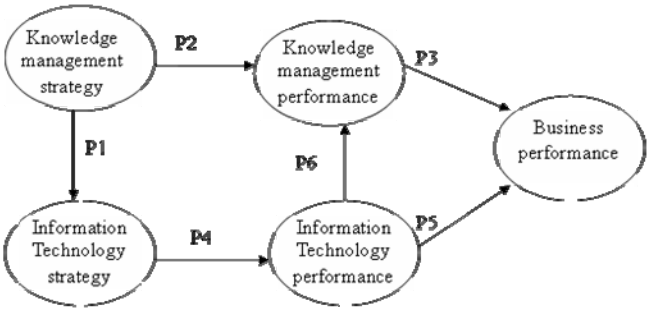


Fig. 1 The research model

III. Conclusion

To sum up, no matter for academic filed or practitioners, there is a necessity to clarify and better understand the meaning of KM and IT strategies. The field of KM is still in its infancy and the empirical study of its integration with IT to the research dominates. Based on the premise that the business value from KM and IT investments requires integration with KM strategy and IT strategy, thus, we developed a KM and IT strategy effects model for analyzing and assessing alternative strategic patterns with regard to KM performance and organizational performance.

Extension of this study would be applied with empirical data to asses this model. Through examining with statistical methods, a crystal definition of well-fitted structural equation modeling in practices filed is expected. The findings will definitely benefit academic research and industries practice.

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