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A MODEL OF KNOWLEDGE MANAGEMENT PERFORMANCE FOR SMALL AND MEDIUM-SIZED ENTERPRISES ENGAGING IN ALLIANCES

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Abstract: *Considering knowledge management (KM) in alliances has become increasingly important regarding the key role of knowledge as an essential resource shared through collaboration. However, alliance partners always find it challenging to successfully manage the knowledge acquired by cooperation. In particular, small and medium-sized enterprises (SMEs) that suffer from resource and expertise scarcity encounter more challenges. In this regard, identifying major factors influencing KM success in alliances between SMEs may contribute to a better understanding of the issue and provide practical solutions. Hence, this study aims to propose and develop a model of KM performance focusing on SMEs that have built alliances. This model incorporates insights on the role of KM practices during and after the formation of alliances. Identifying relevant components, we attempted to promote a framework providing a measurement instrument for assessing the success of KM initiatives in SMEs engaged in alliances.*

Keywords: *knowledge management (KM), performance evaluation, measurement, small and medium-sized enterprises (SMEs), alliance management*

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INTRODUCTION

Inter-firm coopetition strategies referring to simultaneous collaboration and competition between organizations has attracted the attention of scholars researching on cooperative strategies (Bunger et al., 2014; Gnyawali, and Park, 2011). Alliances as one of these major strategies, has been the main focus of many previous studies. The idea of strategic alliances is interesting for firms because of major motives. Lorange et al. (1992) point out four generic motives for a firm to engage in alliances: to sustain its competitive advantage over time (defend), to strengthen a firm's competitive position by forming an alliance with a leader in its business segment, helping it move toward becoming a leader (catch up), to get the maximum efficiency out of a firm's position where the business plays a peripheral role in the portfolio of a firm and the firm is a leader in its business segment (remain) and finally to go to the point of actually exiting a business where the firm is a follower and the business is peripheral in its portfolio**.**

However, reviewing literature reveals that studying alliances from the viewpoint of KM has been undertaken less. An alliance is defined as a cooperation agreement between two or more organizations held to accomplish private and common goals via the sharing of resources and coordinating value chain activities (Street and Cameron, 2007; Bicen and Hunt, 2012). Granted that enterprises are always willing to accumulate and apply knowledge in order to create economic value and competitive advantage (Lee et al., 2005; Van Wijk et al., 2012), incorporating KMP into the investigation of alliances can be worthwhile. Thereby, the main objective of this research is to extend the alliance literature into the domain of KMP through proposing a model and developing a measurement tool.

Reviewing the alliance literature more extensively reveals that studying this strategy has been recently undertaken in the field of small and medium-sized enterprises (SMEs) (e.g., Blind and Mangelsdorf, 2013; Brouthers et al., 2014). Based on *the Recommendation of the European Commission* in 2003*,* SMEs are defined as enterprises which: I) Employ fewer than 250 persons, and II) Have an annual turnover not exceeding EUR 50 million, or III) An annual balance sheet total not exceeding EUR 43 million. Regarding the increased need of businesses to specialize more, large firms are impelled to build alliances with networks of small businesses (Dana et al., 2001). Small-scale firms, on the other hand, find it beneficial to develop relationships with larger firms through approaches like alliances in order to

compete against large companies (Dana et al., 2008). In this regard, a key issue is for alliance partners, especially SMEs, to evaluate their fulfilment of KM tasks. This suggests the need for further research to clarify the dimensions and items of KMP construct for SMEs engaged in alliances. Hence, bridging the gap in the alliance literature, the current research intends to identify factors affecting KM success during and after the formation of alliances between SMEs.

According to the objectives of this study, the following questions have been the focal points of research:

- What is the contribution of KM performance to the SME alliance literature?
- What are the main components determining KM performance of SMEs engaged in alliances?
- What are the main alliance-related factors influencing KM performance of SMEs engaged in alliances?
- How the alliance-related factors affect the relationships between KM performance elements?

LITERATURE REVIEW

Knowledge management

Due to significance of knowledge management and the intricacy of its nature, knowledge management is known as the a core competency that each organization must take it into consideration and make an effort to develop it in order to have a successful performance and gain sustainable competitive advantage in dynamic business world (Skyrme and Amidon, 1998; Haslinda and Sarinah, 2009). Grant (1996) expressed that considering knowledge as a resource and make an attempt to create and put it into use is so called knowledge management (Villar et al., 2014). Many attentions have focused on this concept and both scholars and organizational experts have done many researches and studies in this discipline.

There are different viewpoints of knowledge and their effect on knowledge management. Alavi and Leidner (2001) introduced five categories of viewpoints including: a state of mind; an objective; a process; a situation of availability to information; and a capacity (Alavi and Leidner 2001). In “state of mind (Knowledge is the state of knowing and understanding)” and its implication for KM is the enhancement of individual learning and realizing by

providing information. In "objective (Knowledge is an object to be stored and manipulated)" view, the main KM matter is to build and manage Knowledge repositories. The "process (Knowledge is a process of applying expertise)" view, KM's center of attention is on knowledge flows that contain the whole process of creating, sharing, distributing knowledge. In "access to information (Knowledge is a condition of access to information)" perspective, KM involves organizing content accessibility and retrieving is the focal point. Finally in "capability (Knowledge is the potential to influence action)" view, KM's focus is on building core competencies (Lee et al., 2004).

Although there is no common consent on knowledge management definition (Earl, 2001; Manovas, 2004), the most welcomed definition of knowledge management is relevant to organizational process capabilities, which bring about development and put knowledge into practice in order to improve organizational performance in long term by adding value to it (Nguyen and Neck, 2010). As a process knowledge management according to system theory includes four classes contains 1-acquiring or building knowledge, capturing, accumulating and retrieving knowledge 2- transferring and sharing knowledge4- putting into practice knowledge (Kongpichayanond, 2009; Massa and Testa, 2009). In capability view knowledge management defines as the ability of the organization to productively (efficiently and effectively) manage (creating, acquiring, sharing and applying) organization's knowledge which enables the firm to gain innovative agility that leads to improvement of organizational performance (Singh et al., 2006; Wan, 2009; Sun, 2010).

The same as KM definition, researches have not mutual consent on the knowledge management process too. Many of them bring up various types of knowledge management processes. For instance, Lee and Sunoco (2007) considered knowledge process capabilities as follow: knowledge production, acquisition, facilitation, presentation, storage, application, transfer, and measurement. Moreover, Seleim and Khalil (2007) mentioned these processes as knowledge acquisitions, documentation, transfer, creation, and application. Gold et al. (2001) stated four phases for knowledge management processes. These stages are knowledge acquisition, knowledge transfer, knowledge application, and knowledge protection. Knowledge acquisition is the ability of a firm to recognize and gather both internal and external knowledge which is useful and essential for its functions and activities (Gold et al, 2001; Zahra and George, 2002). Acquiring knowledge can contain many variety

aspects such as creation, sharing, and distribution (Matin and Sabagh, 2015). Knowledge transfer refers to alteration the acquired knowledge from internal and external resources to organizational required knowledge, which leads to effective usage of the knowledge. Indeed this conversion process is transitory cycle in which data converts to information and then to knowledge (Bhatt, 2001). Knowledge application indicates value creation in organization by actuating knowledge, which manifested in innovations, inventions and creations such as new products and services (Mills and Smith, 2010). Knowledge protection is about maintaining the organizational knowledge from misuses by employing copyrights and patents, which is essential for keeping organization's competitive advantage (Lee and Young, 2000; Emadzade et al., 2012; Matin and Sabagh, 2015).

Lee et al. (2004), also classify knowledge management studies into five groups. First group as "general" that contains several managerial and social issues related to KM in terms of KM strategies and culture of organizations, and particular activities and procedures in the bounds of KM. Second group includes studies about learning organizations which indicates how firms preserve organizational knowledge, improving their learning capability and designing the suitable methods and processes for this purpose due to achieve sustainable competitive advantage. "Role of IT" is the title of third group of studies that investigate the knowledge management systems (KMS), general and particular role of IT in KM activities and how IT support and contribute KM which leads to improvement in organizational performance. Forth group labeled as "success and failure factors" comprises factors that will use in formulating Km strategies. The fifth and indeed the last group is given name as "evaluation of KM performance." This group includes studies, which their purpose is valuing, and in fact evaluating knowledge management performance as an intangible asset of organization. Researches on Intellectual capital, Balanced score card, strategic organizational learning and organizational capabilities are place in this category (Lee et al., 2004). Regarding to this classification, this study is placed in the last category (i.e., evaluation of KM performance).

Nowadays most of the organizations are involved in one or more knowledge management projects. Davenport et al. (1999) identify four kinds of knowledge management project including: 1- creating knowledge banks (to make an effort to acquire knowledge and distinguish knowledge creator from its user); 2- Enhancing knowledge transfer and sharing

in order to facilitate the accessibility; 3- Improving knowledge environment (Implementing sense-making activities in order to build awareness and cultural attention to share knowledge); 4- Consider knowledge as an asset like the other assets on the balance sheet, on the other world using the appropriate methods of evaluating knowledge management performance (Shannak, 2009). There are a few methods of measuring knowledge management performance, on the other hand finding appropriate method is critical too. These two points make significant challenges for organizations and this can be sense in context of alliances of SMEs as well. Therefor it is necessary to do research work in this field.

KNOWLEDGE MANAGEMENT PERFORMANCE

The importance of KM practices within organizations has induced managers to allocate considerable amount of time, resource and budget evaluating the performance of KM activities (Chen et al., 2009; Karatop et al., 2014). KM performance assessment empowers firms to more effectively detect the strengths and weaknesses of their KM system that, in turn, provide them with increased capacity for integration and cooperation, enables them to build more formal and informal ties within the organization, and broadens the awareness of personnel about KM-related activities and procedures (De Gooijer, 2000; Lo and Chin, 2009). It also facilitates the supervision of strategic organizational learning capabilities which are necessary for competitiveness enhancement (Tseng, 2008). Recognizing the knowledge-based view of a company from the perspective of resource-based strategic theory, KM performance specifies the extent to which knowledge as a strategic asset develops inside the firm (Lee et al., 2005). The importance of KM performance, therefore, has raised a wide range of interest, in particular, in recent studies. Zhang and Zhang (2014) emphasizing the role of KM in organizations' competitive advantage enhancement through new product development (NPD) practices, assert the positive impacts of both financial and non-financial incentives of internal team-based projects on firms' KM performance. In fact, collective practices within organizations improve their KM capabilities through knowledge creation, accumulation, sharing, and utilization. Investigating the effect of KM practices on organizational performance, Valmohammadi and Ahmadi (2015) point out the roles of several critical success factors including the leadership role, organizational culture, KM strategy, internal procedures, employees' training, information technology competences, and motivation and rewarding system. An et al. (2014) shed light on the pursuit of

collaborative innovation from KM perspective and conclude that KM practices in organizations support collaborative innovation community capacity building. They accentuate the competitive advantages gained by collaboration and in this regard, major factors such as trust building, effective communications and synergy that contribute to sustainability in the environment are recognized.

KM performance is the extent to which the knowledge is effectively create, accumulate, share, and utilize by organizations (Lee et al., 2005; Ho et al., 2014). It is also defined as a means to distinguish firms' performance improved by KM capabilities from their performance enhanced by other organizational capabilities (Tseng, 2008). Evaluating KM performance, managers can monitor and understand to what extent their KM practices coincide with their expectations. This evaluation incorporates several indicators such as new product development, frequency of ideas generated, speed of response to customer needs and requests as well as market changes, employee empowerment resulting in their safety and health, organizational culture and behavior development, internal business functioning excellence and financial measures (Chen et al., 2009; De Gooijer, 2000; Zhang and Zhang, 2014). A generally acknowledged fact in KM performance evaluation is the role of KM system which is designed and implemented inside organizations in order to support KM-related functions including creation, record, retention, transfer, and application of the knowledge acquired by personnel (Yu et al., 2009; Tseng, 2008).

The concept of KM performance has been engaged across various perspectives resulting in different conceptualizations from scholars. Exploring the KM system performance indicators, Tseng (2005) recognizes KM system as a process encompassing three components namely KM strategy, the plan of KM, and the implementation of KM plan. In Tseng's proposed model, these three elements determine KM performance measured by both financial and non-financial indicators. Viewing KM performance as a process of input, output, throughput, and feedback also is popular among researchers. Yu et al. (2009) developing a knowledge value-adding model, acknowledge the creation of raw knowledge in the input phase and the accumulation of value-added knowledge as an output of the process. In addition to these approaches, the application of balanced scorecard in the performance evaluation of KM activities is widely recognized by scholars and practitioners. Adapting the balanced scorecard approach (Kaplan and Norton, 1996), De Gooijer (2000)

design a KM performance scorecard covering four major areas: financial performance, internal business procedures, customers/stakeholders, and firm growth. This KM performance framework, in particular, identifies the core result areas of a successful KM system in strategy, products/services, information technology, internal processes, external relationships, and organizational culture and behavior.

In addition to the identification of KM performance elements and dimensions, previous studies on KM performance suggest multifarious measures and categorizations. Developing a new metric, Lee et al. (2005) introduced the knowledge management performance index (KMPI) for evaluating the performance of a firm in its KM at a point in time. Their index includes five components namely, knowledge creation, knowledge accumulation, knowledge sharing, knowledge utilization, and knowledge internalization. Similarly, Chen and Chen (2005) used the KMPI for measuring knowledge management performance. Their research focuses on four perspectives including knowledge creation, knowledge conversion, knowledge circulation, and knowledge application. Adopting analytical network process (ANP) approach, Chen et al. (2009) developed a measurement for KM performance from competitive perspective. Their ANP model incorporates the balanced scorecard (BSC) into measurement and comprises four levels. In particular, the third level of their model relates to knowledge circulation process comprising five components of the Lee et al. (2005)'s KMPI. Del-Rey-Chamorro et al. (2003) provided a framework measuring KM performance. Their framework consists of three stages including strategic level focusing on the fulfillment of firms' objectives, intermediate level that links strategic level to operational level, and operational level that represents the measurable indicators of KM performance. Choy et al. (2006) adopting a case study approach, propose a measurement scale for KM outcomes consisting of five dimensions relating to systematic knowledge practices, personnel empowerment, customer satisfaction, external relationship development, and organizational success. Customer/user satisfaction as one of the dimensions of KM performance construct has been even more emphasized in some researches. Lo and Chin (2009) underlining some critical success factors of KM process, propose a user-satisfaction-based KM performance measurement model which highlights several major outcomes including knowledge-user expectation recognition outcomes, KM design outcomes, KM delivery outcomes, knowledge-user perception outcomes, and knowledge-user expectation

outcomes. The proposed model by Lo and Chin incorporates the notion of customer satisfaction into KM performance evaluation. Table 1 outlines key elements and components of KM performance (KMP) stemming from various perspectives and approach/methods applied in prior studies.

Table 1. Key components defining KM performance (KMP)

Elements/measures of KMP	*Perspective/Approach/Method*	*Scholars*
- Stock price - Price earnings ratio (PER) - R&D expenditure	Providing the KMPI metric (KM performance index) for assessing the knowledge circulation process	Lee et al. (2005)
- Financial performance - Customer intimacy - Operational excellence - Improvement of learning capabilities	Conducting a case study to analyze the use of intellectual capital reports and the balanced scorecard in a software company	Mouritsen (2002)
- Systematic knowledge practices - Personnel empowerment - Customer satisfaction - External relationship development - Organizational success	Systematic literature review followed by case studies	Choy et al. (2006)
- KM strategy - Plan of KM - Implementation of KM plan	Making a connection between knowledge management system (KMS) and KMS performance.	Tseng (2005)
- Financial performance - Internal business procedures - Customers/stakeholders satisfaction - Firm growth - New products/services - Information technology excellence - Development of external ties -Organizational culture improvement	Adoption of the balanced scorecard approach and a KM behavior model to design a KM performance framework	De Gooijer (2000)
- Generation of ideas about new products - Generation of ideas about new production procedures - Development of high-quality products - Response to customer/market needs - Sharing of complementary resources	Focus on the driving impact of incentive mechanism (non-financial and team-based financial incentives) on KMP	Zhang and Zhang (2014)
- Knowledge-user expectation recognition outcomes - KM design outcomes - KM delivery outcomes - Knowledge-user perception outcomes - Knowledge-user expectation outcomes	Incorporating knowledge-user satisfaction into KM performance evaluation	Lo and Chin (2009)

KNOWLEDGE MANAGEMENT PERFORMANCE IN ALLIANCES BETWEEN SMEs

Although the more general literature on KM performance suggests several dimensions and indicators measuring this construct (e.g., De Gooijer, 2000; Huang et al., 2007; Thompson, 2014), there is a need to identify factors relevant to SMEs who have built alliances, because on the one hand, SMEs face specific obstacles in the creation and accumulation of knowledge because of their characteristics hindering the leverage of the required competencies (Gils and Zwart, 2004), and on the other, leveraging information and knowledge across each stage of the alliance process is crucial to its success (Parise and Sasson, 2002). These reasons suggest that SMEs are bound to make more benefits through building 'knowledge-sharing' alliances.

Accordingly, reviewing the KM literature with a focus on alliances of SMEs, We found several dimensions as well as indicators for measuring the business benefits of KM that SMEs gain through alliances. These factors are as follows:

- *Skill, knowledge, and capability complementarity* that refers to the acquirement of new competencies through alliances for partners who cannot obtain those competencies by themselves. In fact, SMEs do need to observe, learn and internalize the know-how of their partners via establishing alliances. This implies that out of the four kinds of inter-partner resource alignment including supplementary, surplus, complementary, and wasteful, SMEs are often impelled to choose complementary.

- *Managing knowledge resources during the formation of alliances* which is a key criterion as it is considered the main reason for high failure rates in knowledge-sharing partnerships. Specifically, for SMEs, their knowledge and information in the form of know-how need to be managed appropriately as they determine their distinguishing competitive advantages.
- *Partner's KM status* that concerns the situation of knowledge and information in alliance partners. Indeed, SMEs are more willing to build alliances with firms who have the knowledge and other competencies that they need and can disseminate them. In particular, prior experiences can help partners to have a better understanding of their KM status.

- *Types of learning in a partnership*: Partners may require different KM practices depending on various types of learning that they expect from alliances including content learning, partner-specific learning, and alliance management learning.
- *Alliance conditions* that can be categorized in three groups including collective strengths of the alliance, inter-partner conflicts, and the pattern of interdependencies among the alliance partners. Depending on the conditions that determine alliance success, each partner can adopt specific KM approach. These conditions are derived from collective strengths of the alliance, inter-partner conflicts, and the pattern of interdependencies among the alliance partners.
- *Alliance partner's similarities* which pertain to the relatedness or connectedness between partners' internal mechanisms such as marketing or manufacturing systems can facilitate the fulfillment of knowledge sharing between partners.

Regarding the theoretical basis and viewpoints outlined earlier, the model of KM performance in alliances between SMEs is presented in Figure 1. This model incorporates factors influencing SMEs' alliances into the KM process consisting of knowledge acquisition, transfer, application, and protection.

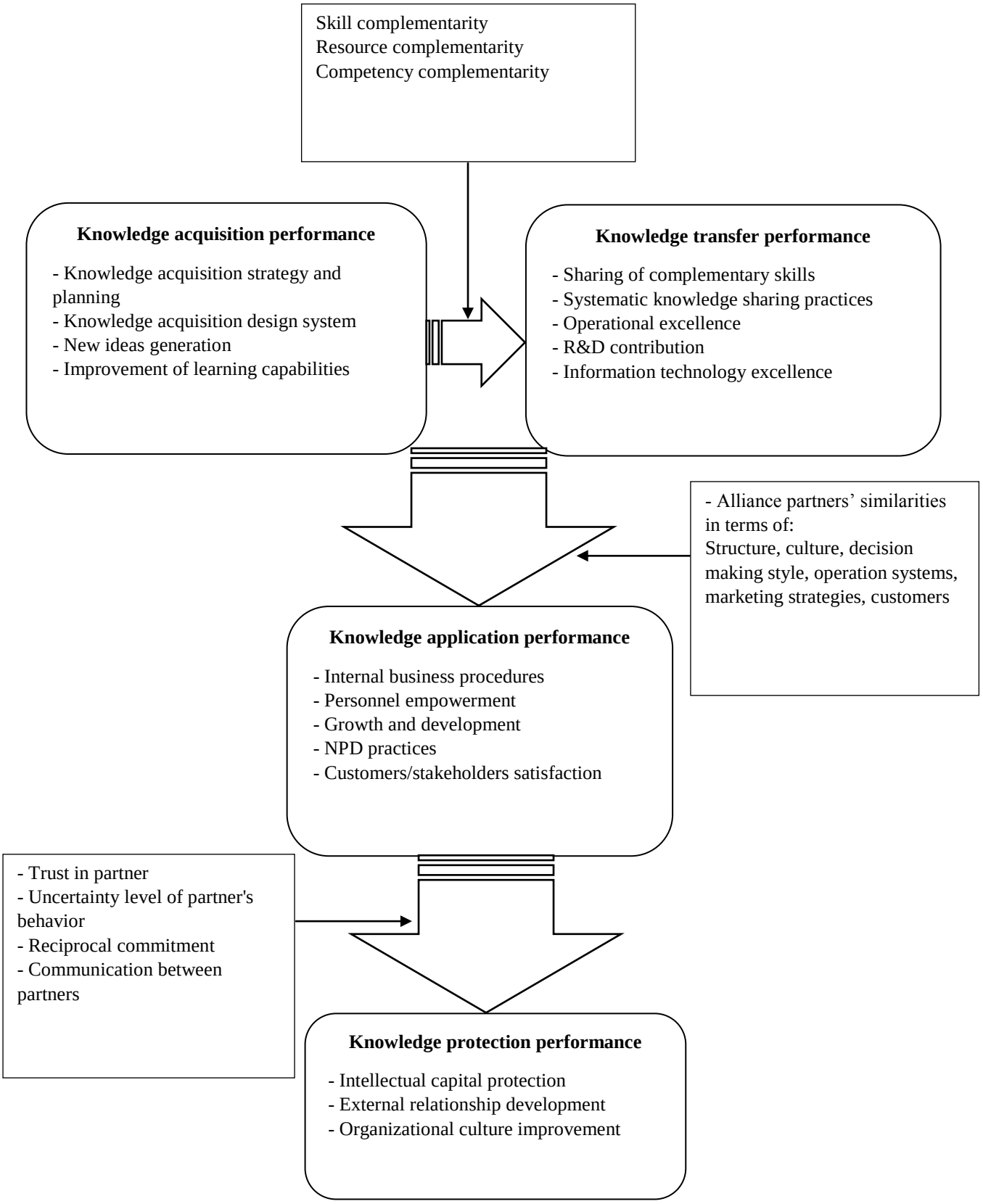

Figure 1. The proposed model of KM performance for SMEs engaging in alliance

CONCLUSION REMARKS

The present study developed a model explaining facts and figures related to the performance assessment of KM practices in alliances between SMEs. Reviewing the literature, first, the main elements of the KM process was recognized in terms of knowledge acquisition, transfer, application, and protection. Then, studying previous research on KM performance, we identified relevant measures in each component of KM process. Finally, the three alliance-related factors influencing the relationships between KM process components were added to the model highlighting key issues facing SMEs in their KM activities during and after the formation of alliances. The proposed model in this research classifies the first two stages of KM process i.e., knowledge acquisition and transfer in the phase of during-alliance formation and the two other stages of KM process i.e., knowledge application and protection in the phase of after-alliance formation.

Accordingly, SMEs' performance in knowledge acquisition phase can be evaluated through monitoring KM strategy and planning, efficiency of knowledge acquisition systems, the extent of new ideas generation inside firms, and assessing the improvement of learning capabilities. The next stage of KM process (i.e., knowledge transfer) is in particular important for SMEs' alliance management. SMEs' knowledge transfer performance can be benchmarked by the success in sharing of complementary skills between partners, the effectiveness of systematic knowledge sharing practices, operational excellence of partners after building alliances, R&D development of partners and the extent alliance parties' IT capabilities. The proposed model acknowledges the effect of alliance partners' complementarity in terms of resources, skills and competencies on the relationship between knowledge acquisition and transfer. Therefore, it is proposed that if SMEs' resources, skills and competencies are complementary to each other, they are more likely to succeed in knowledge acquisition, accumulation, and transfer through alliances.

The next phase of KM process in the proposed model is knowledge application that its performance can be evaluated by monitoring internal business procedures, employees' empowerment, SMEs' growth and development, NPD success, and customers/stakeholders satisfaction. The model suggests that alliance partners' similarities in terms of structure, culture, decision making style, operation systems, marketing strategies, and customers have determining influences on the success of SMEs' in applying knowledge acquired and

transferred through alliances. In fact, SMEs with more similarities than differences can better put the knowledge acquired through alliances in practice because many of their challenges are the same.

Finally, in line with the model, SMEs' performance in knowledge protection can be traced in their intellectual capitals' protection, their success in building external social ties, and their power in improving organizational culture for gaining better results from collaboration. Based on the model, success of SMEs in protecting the knowledge that is applied inside the organization depends on the extent of trust between alliance parties, uncertainty level of partner's behavior, reciprocal commitment to the partnership, and communication between partners. Thus, SMEs that trust each other after building alliances, can better maintain the partnership resulting in successful protection of key information, knowledge, and intellectual capital.

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