



## The Influence of Knowledge Management Processes on Intellectual Capital and Innovation Performance

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### ABSTRACT

**Objective** – Low amounts of management research have taken into account the link between knowledge management processes and intellectual capital in innovation success. This study empirically investigates the mediation role of intellectual capital in the relationship between knowledge management processes and innovation performance.

**Methodology/Technique** – The research questionnaires were distributed to 297 small and medium enterprises wearing apparel companies in Indonesia. The primary statistic methodology for data analysis was Partial Least Square.

**Findings** – The study found that knowledge management processes and intellectual capital significantly influence innovation performance. Furthermore, intellectual capital mediated knowledge management processes impact on innovation performance partially

**Novelty** - IC partially mediates the impact of knowledge management processes on innovation performance.

**Type of Paper:** Empirical.

**JEL Classification:** L67, L25, M19.

**Keywords:** Knowledge Management Processes; Intellectual Capital; Innovation Performance; Small and Medium Enterprises; Wearing Apparel Companies.

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### 1. Introduction

In the current new economy, as characterised by global competition and rapidly changing consumers' needs and preferences, innovation has become a performance-related issue. Some academics and professionals believe that innovation is the driver for strategic renewal and market adaptation, where both of them are crucial for competitive advantage (Stieglitz & Heine, 2007; Delgado-Verde, Navas-Lopez, Cruz-Gonzalez, and Amores-Salvado, 2011). Given the value of innovation to companies, researchers have been searching for ways to understand how innovation can be enhanced.

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Using a Resource-based View (RBV) of the firm approach, researchers proposed the role of knowledge management to improve innovation (Ode & Ayavoo, 2019). According to the RBV approach, knowledge is a valuable, rare, inimitable and non-substitutable (VRIN) resource (Kraaijenbrink, Spender, & Groen, 2010; Arend, 2015). Those characteristics are essential to support organisational performance (Ferreira & Hamilton, 2010; Wang, Wang, & Liang, 2014; Hussinki, Ritala, Vanhala, & Kianto, 2017).

There are 2 streams of academic discussion relating to knowledge within an organisation. Those are intellectual capital (IC) literature, and knowledge management (KM) literature (Kianto, Ritala, Spender, & Vanhala, 2014; Ramadan, Dahiyat, Bontis, & Al-dalahmeh, 2017). The first stream considers IC as static resources or materials for organisational value creation. While the later considers KM as a process to create organisational value.

Even though many studies have considered the important role of KM Processes (KMPs) and IC in creating values, there are only limited studies examining KMPs and IC interaction to support innovation performance (IP) (Cabrilo & Dahms, 2018; Wendra, Sule, Joeliaty, & Azis, 2019). Most of the existing studies focus on assessing IC or KM value levels and then correlating them to IP. There are far fewer studies exploring the degree to which KMPs within organisations affect the quality of IC and IP and are actively enforced (Wendra et. al., 2019). Thus, the research question for this study is: How do KMPs and IC influence IP?

The current paper bridges the existing research gap by examining how KMPs impacts on organisational IC and IP. This study suggests that IC as static resources could be considered as a mediator of KMPs influence on IP. The idea is that KMPs can renew IC, thereby supporting organisational IP. Using the Resource-based View (RBV) approach, this study aims to develop a conceptual model of the causal relationship between KMPs-IC-IP and provide empirical evidence on the model. This research is intended to lead to a wider understanding of the degree to which KMPs and IP relationships can be mediated by IC.

The remainder of this paper is arranged in the following way. In order to establish the research hypotheses, the paper discusses the literature on information management systems, intellectual capital and innovation from the perspective of the RBV. The paper outlines the research methods in the next section. The paper represents the results, discussion and conclusion, respectively, in the last 3 sections.

## 2. Literature Review

The Resource-Based View (RBV) approach was first proposed by Penrose in 1959, based on the Richardian theory of rent (Barney & Arikan, 2001). RBV states that organisational excellence comes from unique and intangible internal organisational inputs, such as knowledge, leadership and culture (Peteraf, 1993 in Wang, 2014). Stemming from the RBV approach, a company's Knowledge-Based View (KBV) focuses on how organisations seek to develop, obtain, secure, transfer and use knowledge (Grant, 1996; Nonaka & Toyama, 2005) to support the organisational competitive advantage (Cabrera-Suárez, Saá-Pérez, & García-Almeida, 2001).

Subramaniam and Youndt (2005) suggest that knowledge can be accumulated within individuals (human capital), relationships and networks (social capital), and the systematisation of knowledge through processes and systems (organisational capital). The accumulation of that knowledge is called intellectual capital (Youndt, Subramaniam & Snell, 2004). Inkinen, Kianto, Vanhala, and Ritala (2017) state that, more recently, researchers have expanded the IC element by adding entrepreneurial capital. The integration of all knowledge resources is crucial to support innovation (Martelo-Landroguez & Cegarra-Navarro, 2014).

### 2.1 Knowledge Management Processes

The American Productivity and Quality Center (2016) formulated knowledge management as a set of strategies and approaches to create and protect knowledge assets, so that knowledge will flow within organisation to the right people at the right time. Knowledge that has been implemented will drive the creation of organisational value. Inkinen (2016) states that knowledge management is a conscious effort and

action taken by organisations, and managers to achieve organisational goals. Similarly, Sigala and Chalkiti (2015) define knowledge management as a structured process for creating, using, collect, transferring, evaluating and maintaining knowledge to answer environmental challenges and create added value. Correspondingly, Chang and Lin (2015) propose that knowledge management aims to produce, represent, store, transfer, transform, apply, glue, and maintain organisational knowledge.

Based on these descriptions, this research formulates the knowledge management processes construct as activities to create, transfer, and implement knowledge to solve problems at work and to achieve organisational goals.

## **2.2 Intellectual Capital**

Intellectual capital is a static element of knowledge (Kianto et. al., 2014; Wu & Chen, 2014; Marzo, Stefano Zambon & Scarpino, 2016). Intellectual capital is the company's passive, measurable, and grouped assets. It has the potential to add value to the company. Kianto et. al. (2014, p. 364) define intellectual capital as the total of intangible resources and knowledge utilised by organisations to create value.

Dost, Badir, Ali, and Tariq (2016) further state that intellectual capital is an intangible resource that can support organisations to achieve sustainable performance. Intellectual capital is the collective intangible resources consisting of know-how, know-why, experience, networking, data and information, organisational structure, innovation, and social values (Khalique, Bontis, Nassir bin Shaari, & Isa, 2015), and entrepreneur behavior (Inkinen et. al., 2017).

Based on the description above, this study defines intellectual capital construct as a collection of knowledge embedded within human resources, organisational, relationships, and entrepreneurial behavior, which can support the company's efforts to achieve high performance.

## **2.3 Innovation Performance**

Performance is the final result of an activity (Wheelen, Hunger, Hoffman, & Bamford, 2015). In comparison, innovation is the production or emergence of new ideas (Gupta, Tesluk, & Taylor, 2007), the development and implementation of something new (Anderson, Potočník, & Zhou, 2014), in the eyes of consumers (Schumpeter, 1934). Innovation is defined by the OECD (2005) as the introduction of products, processes, marketing methods and organisational methods which are new or undergoing very significant changes.

Thus, innovation performance can be defined as the achievement or success of innovations carried out by companies to achieve a desired target (Aryanto, Fontana, & Afiff, 2015). Rijdsdijk, Langerak, and Jan Hultink (2011) argue that the extent to which a new product line reaches financial goals and market sales is the performance of innovation.

Based on the description above, this research defines innovation performance as the final result of new or a significant change in product development, production processes, marketing efforts, and organisational management.

## **2.4 Knowledge Management Processes and Intellectual Capital Relationship**

Nonaka and Takeuchi (1995) suggest that the process of knowledge management influences the accumulation of intellectual capital dimensions. Similarly, Marr, Gupta, Pike, and Roos (2003) state that knowledge management can be viewed as a management process activity carried out by companies to increase intellectual capital effectiveness. Shih, Chang and Lin (2010) and Gholamhossein, Jamal, Peyman and Hamid (2014) argue that knowledge management is a flow of knowledge and management skills that are directed systematically to create knowledge, which can be developed and restructured into intellectual

capital. Similarly, Kianto et. al. (2014) state that intellectual capital is an output of knowledge management. The first proposed hypothesis is:

Hypothesis 1: Knowledge management processes influence intellectual capital positively.

## 2.5 Intellectual Capital and Innovation Performance Relationship

Subramaniam and Youndt (2005) state that part of the knowledge and skills for creating innovation are live within the human. New ideas can be generated by creative and experienced staff. (Anand, Gardner & Morris, 2007), or to question current organisational practices (Amabile, 1997). Therefore, the human's skills and experience are predictors for the company's innovation performance (Kianto, Sáenz, & Aramburu, 2017).

Likewise, structural capital or codified stock of knowledge and experience can improve innovation performance because new products, processes and methods usually involve diverse parts of current knowledge (Fleming & Sorenson, 2004). Meanwhile, relational capital contributes to innovation performance because not all knowledge that is needed for innovation is readily available within the company. Even the majority of breakthrough innovations are transplanted from one industry to another (Hargadon, 2003). In general, the collaboration between organisations will facilitate knowledge sharing activities, interactive learning and will ultimately increase innovation (Pérez-Luño, Medina, Lavado & Rodríguez, 2011). The next proposed hypothesis is:

Hypothesis 2: Intellectual capital influences innovation performance positively.

## 2.6 Knowledge Management Processes and Innovation Performance Relationship

Previous research by Hsu and Sabherwal (2012) shows that the application of knowledge management in companies increases innovation performance. Similarly, Palacios, Gil, and Garrigos (2009) state that knowledge management processes are directly related to innovation and entrepreneurship. Lee, Leong, Hew and Ooi (2013) found that knowledge management processes positively effect innovation within the company. The next proposed hypothesis is:

Hypothesis 3: Besides its indirect influence through of intellectual capital, knowledge management processes influence innovation performance positively.

The research model of the study is as follows:

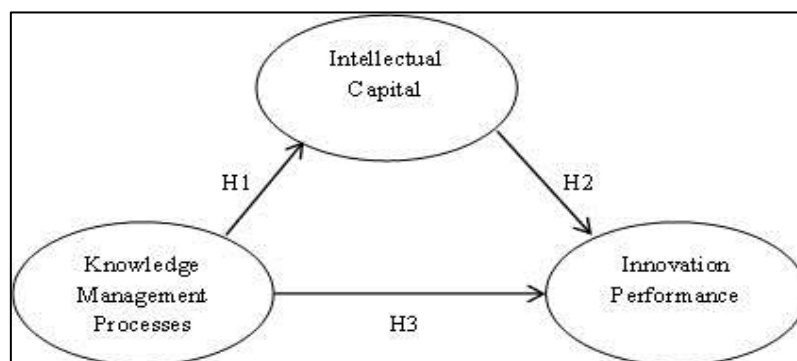


Figure 1. Research Framework

### 3. Research Methodology

Small and medium-sized enterprises (SMEs) wearing apparel companies in Indonesia made up the population in this report. The sample numbers are 297 enterprises found by G\*Power software. The observation unit is the owner and manager of each company.

This study uses survey questionnaires for data collection. Snowball sampling was the main questionnaire distribution technique. KMPs consisted of 3 dimensions and 9 indicators adapted from Wu and Chen (2014), and Gold, Malhotra and Segars (2001). Intellectual capital had 4 dimensions and 13 indicators adapted from Engelman, Fracasso, Schmidt and Zen (2017), Ramadan et. al. (2017), Agostini, Nosella and Filippini (2017), Hussinki et. al. (2017), Inkinen et. al. (2017) and Vera and Crossan (2005). Innovation performance consisted of 4 dimensions and 12 indicators adapted from OECD (2005) and Alcaide-Marzal and Tortajada-Esparza (2007).

The descriptive data analysis used was Microsoft Excel 2010. The hypotheses testing used partial least squares (PLS) method with SmartPLS software, version 3.2.8

### 4. Results

#### 4.1 Description of the Respondents

Most of the participating companies (87%) were small organisations that have existed for at least 5 years (78%). The largest percentage of the location of the respondents where business owners are (94%). Finally, 50% had more than 9 years of experience, which was the highest percentage of the respondents' comparable market experience.

#### 4.2 Validity and Reliability

All indicator factor loads and average explained variance (AVE) values of the first-order factors were higher than 0.5. As all factor loads and AVE values were above their threshold value (0.5), the measurements were valid for good convergence. All composite reliability (CR) values were higher than 0.7, thus the first-order factors had acceptable reliability. Furthermore, all factor loadings of dimensions were higher than 0.7, and AVE values of the second-order factors were above 0.5. Therefore, the measurement had good convergent validity. The CR values were also above 0.7, meaning that the second-order factors had acceptable reliability. PLS algorithm calculation showed that the square root of AVE was more significant than correlation values of latent variables. The results suggest that the instrument fulfilled the requirement for discriminant validity.

#### 4.3 Hypotheses Testing

As shown in Table 1, the hypotheses testing included path coefficients ( $\beta$ ) and T-Statistics. The study found a positive influence of KMPs on IC ( $\beta = 0.746$ ,  $t = 22.029$ ). The study also revealed that there was a positive influence of IC on IP ( $\beta = 0.707$ ,  $t = 17.185$ ). Furthermore, the hypothesis testing discovered that there was a positive influence of KMPs on IP ( $\beta = 0.685$ ,  $t = 18.018$ ). Thus, all hypotheses were supported.

Table 1. PLS Structural Model Summary

Hypotheses	Direct Effect		Partial Mediation	
	Path ( $\beta$ )	T-Statistics*a	Path ( $\beta$ )	T-Statistics*a
H1: KMPs $\rightarrow$ IC	0.746	22.105		
H2: IC $\rightarrow$ IP	0.707	17.185		
H3: KMPs $\rightarrow$ IP	0.685	18.018	0.685	17.284

Note: \*Significant level at  $T\text{-Statistics} > T\text{-Table}$  (1.96). aT -statistics obtained with 1.000 samples bootstrapping procedure.

In order to test the mediating effect of IC on KMPs and IP relationship, Baron and Kenny's (1986) mediated regression technique was used. The test found that KMPs influence on IP was reduced whenever the IC was included in the calculation ( $\beta = 0.685$ ,  $t = 17.248$ ). The results suggest that IC partially mediates the relationship between KMPs and IP.

## 5. Discussion

This study responds to calls for further research that incorporates KMPs and IC to promote success in innovation (IP) (Cabrilo & Dahms, 2018; Wendra et. al., 2019). In general, the results support the idea that KMPs are major drivers of IC and IP. The results are also consistent with previous studies identifying KMPs' main role in shaping IC.

This finding strengthens the results of Seleim and Khalil (2011), and Kianto et. al. (2014) who found that knowledge management processes drive intellectual capital within an organisation. Likewise, the results of this study also confirm the role of IC as a precursor to IP. This finding supports previous research by Hussinki et. al. (2017), and Kianto et. al. (2017) that intellectual capital positively and significantly influences IP. In addition, this study also found that KMPs partially influence IP through the mediation of IC. These result echoes earlier studies which found that knowledge management is a flow of knowledge and management skills that are directed systematically to create new knowledge which can be developed and restructured into intellectual capital (Shih et. al., 2010; Gholamhossein et. al., 2014).

As a theoretical implication, this paper presents pioneering empirical work on the impact that KMPs have on both IC and IP. Further, this study is one of the limited number of studies in the extant literature that focuses on examining the links among KMPs, IC, IP in SMEs within the context of a developing country. By demonstrating that KMPs have a real impact on IC and IP, this paper provides support for the wider implementation of KMPs into managerial practice. Thus managers need to implement KMPs consistently to improve IC and IP.

## 6. Conclusion

This paper concludes that IC partially mediates the impact of KMPs on IP. This finding indicates that the management of knowledge processes is a key managerial mechanism for companies to have high-quality IC and superior IP. This study is subject to several limitations. First, this study collected cross-sectional data. However, it may be that KMPs impact on IC and IP may increase over time. Conducting a time series study might demonstrate a stronger direct impact between KMPs, IC, and IP. Second, this study involved business owners and senior managers as its main respondents. Future studies may wish to include employees in order to provide a more comprehensive understanding of the phenomena.

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