

# Interplay of Knowledge Creation Capability and Organizational Forgetting on Absorptive Capacity and Innovation Performance among SMEs: A Symmetrical Approaches

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## Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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## ABSTRACT

Organizations needs knowledge creation capability and organizational forgetting to enrich their innovative performance in ever-changing business setting. The purpose of this article is to explore the influence of knowledge creation capability, organizational forgetting and absorptive capacity on Firm's innovative performance. We test the model using Partial least squares structural equation modeling (PLS-SEM) to analyze empirical data collected from 194 SMEs listed in Sri Lanka inventors' commission. The findings of the study show that in addition to their individually positive impact of knowledge creation capability and organizational forgetting on firm's innovative

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performance, the absorptive capacity mediates the relationship between knowledge creation capability, organizational forgetting and innovation performance. As one of the first studies to integrate the capabilities of creating internal new knowledge and unlearning outdated knowledge for advancing firm innovativeness through the mediating effect of absorptive capacity. A major implication of this finding is that absorptive capacity enhances the effect of knowledge creation capability and organizational forgetting on firm's innovativeness and affects the types of innovation strategies adopted by firms.

*Keywords: Knowledge creation capability; organizational forgetting; absorptive capacity; innovation performance; SMEs.*

## 1. INTRODUCTION

Businesses are progressively accentuating innovation in order to gain countless opportunities for growth, differentiation, and competitive advantage [1]. It is whispered that firm's innovation is allied with the ability to afford and assimilating new knowledge [2]. Firm can attain new knowledge from both internal and outside sources [3]. Several studies to date have examined the influence of external and internal mechanisms, which impact firm's innovation performance, ranging from environmental factors, such as market and technological uncertainty [4-5] to internal mechanisms, such as organizational structure [6], culture [7] and leadership [8], organizational forgetting [9].

The knowledge creation capability (KCC), which refers to a firm's capabilities to create new knowledge internally [10]; and organizational forgetting (OF), which refers to a way for an enterprise to discard its obsolete knowledge and call into question its pre-established beliefs in order to adapt to various environmental changes [11] fundamentally instrumental for adding new knowledge (absorption). Recently, several studies began analysing the influence of firm's absorptive capacity (ACAP), i.e. the ability to identify, assimilate and commercially apply externally available information [12], using higher sets of empirical data and showing its significant importance for firm's innovation performance [13]. On the other hand, employees with their creativity and innovativeness play an imperative role in ideation as well as implementation of new and improved products and services [14].

Some of these internal and external factors have previously shown its impact on firm's innovation performance either as distinct factors or in connection with other internal and external factors. However, the investigation of the synergies and (in) compatibilities among internal and external factors is still incomplete, because

the research has not provided yet an optimal organizational combination of internal and external factors and resources that would predict greater innovation performance [15-17].

Absorptive capacity and KCC positively influence firm innovation performance. Still, research that examines the interrelatedness among the two concepts is scarce [18,8]. Thus, the aim of this study is to narrow this gap by conceptualizing and empirically testing a model that integrates the organizational aspects, such as KCC and absorptive capacity, and their mutual impact on a firm's innovation.

The enterprises action to forget obsolete knowledge and intemperance the established thoughts and core rigidity (organizational forgetting). It can abandon some of the existing organizational inertia, and afford new cognitive space for innovation and, therefore, generate new knowledge in the organization to be recognized and nurtured, and, then, inspire innovation. It looks well accepted that, organizational forgetting may lead to the ability of an enterprise to innovate and may even directly impact the firm's survival. A reasonable theoretical framework and more empirical tests in needed to provide evidence [19]. Despite growing interest in the topic, researchers in the field of organization forgetting still identify a serious overall lack of conceptual and empirical research. Mainly in comparison to absorptive capacity, the concepts of organization forgetting have received very little attention in scholarly research [19-21].

Managers of many SMEs find huge difficulties in managing their organization in an efficient way due to the difficulties in attaining new knowledge and unlearning impracticable outdated knowledge. Organizational knowledge-base is attuned by firm's abilities to create new knowledge internally (Knowledge Creation Capability), devaluation of knowledge (forgetting)

and adding new knowledge (absorption) to accomplish a new dynamic balance. Hence, it is essential and an extension of natural logic to construct an analysis based on such interactive process in order to answer the intrinsic mechanism of KCC and organizational forgetting on innovation performance of SMEs [8,22]. Absorption capacity is considered to include identifying, assimilating, and integrating new knowledge; it is a dynamic process capability. KCC and Organizational forgetting has an impact on knowledge cognition, conversion and integration approach in the process of innovation. Therefore, this study believes that absorptive capacity may be the important explanatory variables with respect to KCC, organizational forgetting and innovation performance. Although prior researches have mentioned that KCC and organizational forgetting may correlate with absorptive capacity [8,18,22-23]. There is practically dearth of empirical evidence in this regard.

The paper contributes to the literature in the field of innovation management, showing how KCC positively influence a firm's innovation and in this way accompaniments existing evidences on the effects of internal factors on innovation performance. The acumens from the paper are beneficial for the open innovation literature, expounding how to successfully manage internally developed knowledge and ideas.

This study also contributes to the literature on organizational forgetting by clarifying the boundary conditions under which organizational forgetting enhances innovation performance. Moreover, this study contributes to the literature on absorptive capacity by providing evidence on the antecedents of this capability, as well as dynamic capabilities perspective showing how different dynamic capabilities mutually affect a firm's innovation. Finally SMEs would find the means for improving their innovation performance by the adoption of this model.

## 2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

### 2.1 KCC and Innovation Performance

Innovation process can be enthused via KCC, exploiting the knowledge and ideas of employees who are not involved in R & D activities [24]. Firms need to regularly create new knowledge through the leverage of knowledge creation capability in order to sustain them in the

competitive environment. [25], found that innovative information is important to business innovativeness. [26], reported that learning capability positively impacts product innovativeness. Similarly, [9] found that knowledge creation capability is positively related to the number of new products and services. Employees can facilitate new innovations via internal collaboration among divisions that stimulate sharing and borrowing of ideas [27]. Another approach for boosting innovation is stimulation of all employees for searching patentable ideas in and outside the organization [28]. Hence, we propose:

**Hypothesis 1.** KCC has a positive impact on innovation performance of a firm.

### 2.2 KCC and Absorptive Capacity

Several Studies found a stronger link between Organisational knowledge and ACAP [29-31]. Majority of the SMEs also are represented as hooked in to tacit form of knowledge that is commonly troublesome to capture and disperse [32]. This could considerably demotivate workers and stop them from several learning opportunities. It will influence and form each outside and intrinsic motivation of workers in their ability and enthusiasm to find out and share learning that is preponderant to the success of ACAP [8]. Therefore it is proposed:

**Hypothesis 2.** KCC has a positive impact on Absorptive capacity.

### 2.3 Organization Forgetting and Innovation Performance

Martin de Holan et al. [33] highlight the importance of managing knowledge loss to improve competitive advantage. Undoubtedly, managing forgetting processes is vital for firm innovation performance. Organizational forgetting is the driving force for innovation [34], because it can promote innovation by improving organizational reactivity and adaptability to the environment [33], and the more organizational forgetting, the stronger the innovation performance [35].

**Hypothesis 3.** OF has a positive impact on Innovation performance.

### 2.4 Organization Forgetting and Absorptive Capacity

Organizational forgetting is to reshape business qualities or practices by evolving convictions,

standards, qualities, techniques and schedules, the psychological models [36], intellectual structures [37], prevailing rationales [38] and center suspicions which control conduct [39] to accomplish an upper hand. Subsequently, the Organizational forgetting isn't just an instrument for overlooking obsolete knowledge, yet additionally the manner by which firms can create and make space for new learning. Its impact, is related with its capacity to set up the ground for absorptive capacity.

**Hypothesis 4.** OF has a positive impact on Absorptive capacity.

**2.5 Absorptive Capacity and Innovation Performance**

SMEs are described to be less ready to exploit innovation [40-41] with the absent of ACAP [41-42]. Moreover, Absorptive capacity promotes the enterprise's innovation performance from innovation speed, innovation frequency and innovation level [12]. Forgetting is a required process to erase certain routines and rules before new organizational knowledge can be acquired and assimilated [34]. Therefore, the organizational forgetting provides a fostering space for the generation and cultivation of absorption capacity through reconstruction of organizational knowledge system.

**Hypothesis 5.** ACAP has a positive impact on Innovation performance.

**2.6 Mediation Hypothesis**

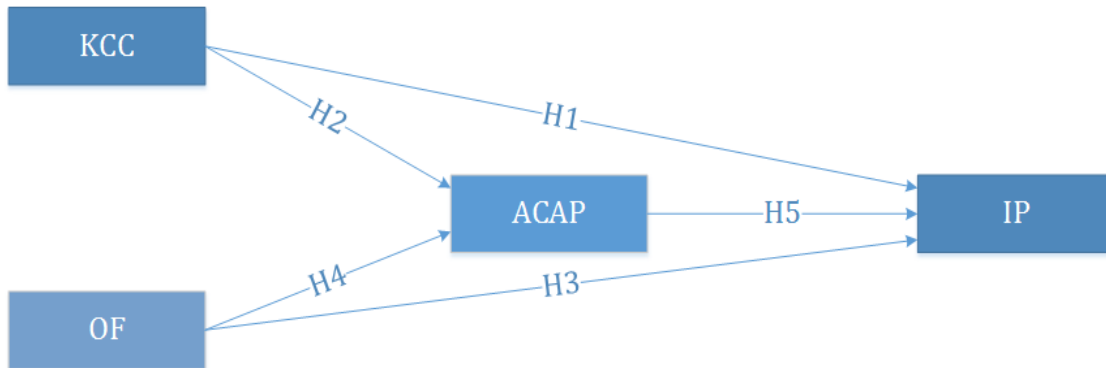
**2.6.1 ACAP mediates the relationship between KCC and IP**

Research on knowledge creation capability, absorptive capacity and innovation has found that knowledge creation capability positively impacts on innovation performance, and the relationship is mediated [43] by absorptive capacity. Considering that knowledge creation capability can directly impact on innovation results, but that when absorptive capacity is considered in the equation, the effect of creation tends to change, we formulate the following hypothesis:

**Hypothesis 6.** Absorptive capacity mediates the relationship between KCC and innovation performance.

**2.6.2 ACAP mediates the relationship between OF and IP**

Absorptive capacity is an important factor to help enterprises achieve organizational performance [44]. Most of the studies have shown that absorptive capacity has a positive impact on



**Fig. 1. Conceptual model**

**Table 1. Details of the sample and data collection procedure**

Property of the sample	Details of the sample
Target population	413
Analysis unit/sampling unit	The firm
Sample size (response rate)	194 valid surveys (46.97%)
Key informant	CEO
Confidence level	95%; $z = 1.96$ ; $p = q = 0.50$ ; $\alpha = 0.05$
Date of data collection	July to November 2018

innovation performance. Absorptive capacity promotes the enterprise's innovation performance from innovation speed, innovation frequency and innovation level [12].

**Hypothesis 6.** Absorptive capacity mediates the relationship between OF and innovation performance.

The model is shown in Fig. 1

### 3. METHODOLOGY AND DATA ANALYSES

The empirical analysis of the proposed conceptual model is carried out based on the survey instrument that was sent to the top executives of randomly selected 413 firms from the database of Sri Lanka's inventors' commission 2016. This study sent an invitation to all these 413 organizations and only 220 were interested to participate. In the second round, this study sent an e-mail to all those companies along with the questionnaire link developed in Google form. With seven reminders and five months of effort, this study managed to get 194 responses, yielding a response rate of 20.86%, which considered adequate to execute multivariate analysis. Data were collected between July to November 2018 (see Table 1).

The questionnaire was developed including measures previously developed and validated in prior research. All measures were evaluated on a 7-point Likert scale (e.g. from strongly disagree to strongly agree). The questionnaire was administered in English language. Before final execution of the survey, we pretested the questionnaire on a sample of 18 CEOs to receive feedback on the understanding and accuracy of the instrument.

Statistical power analysis was conducted for the sample using Cohen's test in G \* Power 3.1.9.2 [45]. The sample had a statistical power of 0.998, surpassing the minimum threshold of 0.80 established by Cohen [46]. To avoid potentially affecting the standard deviation of the scores reported by the CEOs, the risk of common-method variance due to single informant bias was assessed.

#### 3.1 Measures

Knowledge creation capability (KCC) was measured using six items and the items were

taken from the scale proposed by Su et al. [18]. The Appendix shows the questions that were used to measure the dimensions of KCC. Organizational forgetting (OF) was measured by five items used by Akgun et al. [26] and validated by Huang et al. [22]. The Appendix shows the questions that were used to measure the dimensions of organizational forgetting. Absorptive capacity (ACAP) was measured with a scale developed by Kotabe et al. [47]. The Appendix shows the questions that were used to measure the dimensions of ACAP. Innovation performance (IP) was measured by the items used by Jiménez-Jiménez and Sanz-Valle [48] for evaluating a firm's product and process innovation. Respondents evaluated the company's innovation performance against the major competitors in the industry in last 3 years. The Appendix shows the questions that were used to measure the dimensions of innovation performance.

#### 3.2 Symmetrical Modelling

PLS-SEM was used to test the hypotheses and analyze the mediating effect of absorptive capacity. SmartPLS v.3.2.7 was employed for the analysis [49]. The analysis was conducted in two stages to ensure the measurement scales were valid and reliable [50]. The first stage consisted of analysis of the measurement model. The second stage consisted of analysis of the structural model.

### 4. RESULTS AND FINDINGS

#### 4.1 Analysis of the Measurement Model

Following [51] recommendations, the first step was to analyze the values of the composite reliability, Cronbach's alpha, and the average variance extracted (AVE), which enabled verification of the reliability of the constructs. [52], recommend values greater than 0.7 for the factor loadings and [53] recommend values greater than 0.7, 0.7 and 0.5 for the composite reliability, Cronbach's alpha, and AVE, respectively. The corresponding values for the data in this study exceeded these thresholds. Hence, the convergent validity of the scales was confirmed (see Table 1).

The discriminant validity was verified by checking that the correlations between each pair of constructs did not exceed the value of the square root of the AVE for each construct (see Table 1).

The heterotrait–monotrait ratio of correlations (HTMT) for Mode a composites was also used (see Table 2). For discriminant validity to hold, the values of the HTMT should be less than 0.85 [54]. In this study, these conditions were met, so discriminant validity was confirmed.

### 4.2 Analysis of the Asymmetrical Modeling

After confirming the convergent and discriminant validity of the measurement model, the relationships between the variable were tested.

**Table 2. Composite reliability, convergent and discriminant validity, Heterotrait–Monotrait (HTMT) ratio, and descriptive statistics**

Composite/measure	AVE	Composite reliability	1. ACAP	2. IP	3. KCC	4. OF
1.ACAP	0.646	0.916	0.804			
2.IP	0.641	0.914	0.761	0.801		
3.KCC	0.661	0.886	0.582	0.596	0.813	
4.OF	0.697	0.920	0.725	0.758	0.6	0.835
			1. ACAP	2. IP	3. KCC	4. OF
1.ACAP						
2.IP			0.852			
3.KCC			0.65	0.669		
4.OF			0.811	0.849	0.668	
Cronbach's alpha			0.89	0.888	0.831	0.891

*The elements on the diagonal are the square roots of the AVE*

**Table 3. Summary of direct relationships and mediating effect tests**

A) Effects on endogenous variables structural path	Path coefficient <sup>a</sup>	t-valued (Bootstrap)	95% confidence interval		Status
			Lower	Upper	
KCC -> IP	0.22	3.73	0.01	0.24	H1 supported
KCC -> ACAP	0.23	3.55	0.10	0.35	H2 supported
OF -> ACAP	0.58	11.11	0.47	0.68	H3 supported
OF -> IP	0.62	11.23	0.24	0.53	H4 supported
ACAP -> IP	0.40	5.39	0.26	0.55	H5 supported
(B) Summary of mediating effect tests effect	Point coefficient	t-valued (Bootstrap)	95% bias-corrected confidence interval	Interpretation	Status
KCC -> ACAP -> IP	0.09	2.86	0.04, 0.17	Partial mediation	H6 supported
OF -> ACAP -> IP	0.24	4.72	0.14, 0.35	Partial mediation	H7 supported

*Note: aR2 ACAP = 0.56; Q2 ACAP = 0.33; R2 innovation performance = 0.68; Q2 innovation performance = 0.40. Thresholds for R2 ≥ 0.25 are weak; ≥ 0.50 are moderate; and ≥ 0.75 are substantial. A threshold for Q2 > 0 indicates predictive relevance. \* |t| ≥ 1.645 at the p 0.05 level; \*\* |t| ≥ 2.327 at the p 0.01 level; \*\*\* |t| ≥ 3.092 at the p 0.001 level. Bootstrapping was based on n = 5000 subsamples. R2 = Determination coefficients; Q2 = predictive relevance of endogenous variables (omission distance = 7); Sig. = significant; ns = not significant (based on t (5000), one-tailed test)*



To determine the effects, the steps proposed by Hair et al. [55] were followed. First, the results show minimal collinearity in the structural model as all VIF values are far below the common cut-off threshold of five to ten [55]. Second, following the rule of thumb, the  $R^2$  values of ACAP (0.56) and innovation performance (0.68), which is a satisfactory level of predictability as shown in Table 3. Third, significance levels of the path coefficients were obtained using the bootstrapping procedure (with a number of 5000 bootstrap samples and 396 bootstrap cases; using no sign changes) as shown in Table 3(A). An analysis of the path coefficients and levels of significance shows that all direct effects are significant. Therefore, 1, 2, 3, 4 and 5 are accepted. Fourth, the blindfolding procedure produces  $Q^2$  values. All  $Q^2$  values are considerably above zero, therefore providing support for the model's predictive relevance as shown in Table 3. This study followed the procedure in [56] to test the mediation hypotheses (H6 and H7). Yet again, the bootstrapping procedure was used to generate  $t$ -statistics, significance levels,  $p$ -values, as well as 95% confidence intervals (percentile) for the mediators [57]. Table 3(B) shows the results of mediation analyses. Therefore, these results support H6 and H7.

## 5. CONCLUSION

Organizations need KCC and OF to enhance their innovative performance, as a matter of fact, in ever-changing business situations. This empirical study added to such innovative performance of the SMEs mainly depend on the effort to enhance the knowledge creation while unlearning outdated knowledge. Moreover, the findings suggest that both internal new knowledge and unlearning outdated knowledge can advance firm innovativeness, and they should be integrated together to maximize their effects.

This article contributes to the literature by showing that in addition to their individually positive impact of KCC and OF on firm's innovative performance, the absorptive capacity mediates the relationship between KCC, OF and innovation performance. This finding is consistent with previous studies [22,24], which have confirmed the mediating role of absorptive capacity. The findings of the study also show that absorptive capacity enhances the effect of KCC and OF on firm's innovation performance: the mediation model explained 68% of the variance

of firm's innovation performance. From a practical point of view, the research indicates that the interaction of different dynamic capabilities with KCC and OF enhance firm's innovation performance. Since absorptive capacity enable organization to absorb the new knowledge and discard outdated knowledge for the improvement of product and process innovation.

The KCC and OF are undoubtedly key factors of firm's innovation performance [18], with implication for the management of SMEs. The KCC and OF affects the types of innovation strategies adopted by firms [33,22,8,48,24].

The KCC of SMEs in terms of their employee involvement in the idea generation and value creation; the organizational forgetting of SMEs in terms of the negative effects of outdated knowledge, values, beliefs and practices and continues effort to test the validity of existing knowledge and practice, and enhance organizational flexibility. Promoting organizational forgetting behaviors among members consciously, eliminate barriers for learning new knowledge and improve the speed of searching for knowledge determine their capacity to identify, assimilate and exploit new knowledge. In this study, KCC and OF explained 56% of the variance of absorptive capacity. This study presents a new model for improving innovative performance for SMEs. The SMEs can improve their innovativeness by considering the mediating role of absorptive capacity in the relationship between KCC, OF and Innovative performance.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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**Appendix: The measures of the study construct**

<b>Concept</b>	<b>Measures</b>	<b>Sources</b>
KCC	<p>Employees meet frequently to discuss work-related ideas and new developments</p> <p>Employees do not have difficulty getting together to exchange new ideas and developments;</p> <p>Employees are always available to discuss new ideas or development;</p> <p>Employees see benefits from exchanging and combining ideas with one another;</p> <p>The most valuable ideas seem to come when employees pool their effort;</p> <p>Employees believe that, by exchanging and combining ideas, they can create value for the company</p>	[16]
Organizational forgetting (OF)	<p>The company will introduce new knowledge that conflicts with previously experience and skill</p> <p>The organization can change the new product development process according to the change of the external environment</p> <p>The organization is able to continuously optimize its team decision making process</p> <p>Organizations can change their internal information sharing mechanism</p> <p>Companies are willing to acquire new technologies from different sources</p>	[20], [24].
Absorptive capacity	<p>We have the capability to adapt acquired new knowledge to fit the firm's development need.</p> <p>We have the capability to develop new applications by applying assimilated new knowledge.</p> <p>We have the capability to find alternative uses of assimilated new knowledge.</p> <p>We have the capability to introduce product/service innovation based on acquired new knowledge.</p> <p>We have the capability to fuse assimilated new knowledge with existing knowledge.</p> <p>We have the capability to revise manufacturing/service processes based on acquired new knowledge.</p>	[8], [45].
Innovation Performance	<p>Much worse than competitors/much better than competitors)</p> <p>In the last 3 years, our firm has performed worse/better than competitors in regard to the number of new products/services launched.</p> <p>In the last 3 years, our firm has performed worse/better than competitors in regard to pioneering the introduction of new products/services (you were one of the first to introduce a new product/service).</p> <p>In the last 3 years, our firm has performed worse/better than competitors in regard to the effort invested in the development of new products/services, taking into consideration the number of hours, people, teams and trainings.</p> <p>In the last 3 years, our firm has performed worse/better than competitors in regard to the number of introduced changes in processes.</p> <p>In the last 3 years, our firm has performed worse/better than competitors in regard to pioneering newly introduced processes (you've been one of the first to introduce new</p>	[8], [46]

<b>Concept</b>	<b>Measures</b>	<b>Sources</b>
	processes). In the last 3 years, our firm has performed worse/better than competitors in regard to responding to new processes introduced by other companies in your field.	

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