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ANTECEDENTS AND PERFORMANCE OUTCOMES OF INNOVATION CAPABILITY IN SMALL-MEDIUM ENTERPRISES

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ABSTRACT

To achieve sustainable competitive advantage in the contemporary business environment organizations are continually demanded to develop the propensity to innovate. Accordingly, this has led to increased interest in understanding the factors driving innovation capability in organizations. Nevertheless, the Sri Lankan manufacturing sector has a laid-back approach pertaining to innovations. This study examines the antecedents of innovation capability and performance outcomes of innovation capability in SMEs by integrating the resource-based view and dynamic capability view. To achieve this objective this study adopted an explanatory research design and collected data from 190 manufacturing sector SMEs in Sri Lanka. Structural equation modelling was used to analyze the relationship between antecedents of innovation capability and its impact on product innovations and process innovations. Accordingly, the empirical findings of the current study contributed to the innovation management literature by validating a new framework based on seminal arguments of RBV and dynamic capability view to determine the antecedents of innovation capability in the manufacturing SME sector. Moreover, the findings of the study theorized that the identified antecedents of innovation capability will positively influence product innovation capability and process innovation capability.

Keywords: Antecedents of innovation, Dynamic capability view, Innovation capability, Resource-based view, SME innovation capability

1. Introduction

Innovation management theory and practice have recognized the increasing importance of innovations as the new frontier of competitive advantage for organizations and economies alike (Kyrgidou & Spyropoulou, 2013; Schneckenberg et al., 2015). Notably, globalization has intensified competitiveness (Francis & Bessant, 2005), thereby demanding countries and organizations to nurture innovation as a priority to survive (Quinn, 2000; Wang & Ahmed, 2004) and generate a sustainable competitive edge (Tajeddini, 2011; Mendoza- Silva, 2020). Hence, organizations are actively seeking resources and capabilities that would drive innovation performance (Saunilla & Ukko, 2012; Saunila, 2017; Szłapka et al., 2017; Mendoza-Silva, 2020). Meanwhile, SME literature has also focused on innovation capability as a determinant of SME innovation

performance (Saunilla & Ukko, 2012). Thus, the research on innovation capability has flourished recently. Despite the contribution of existing studies on innovation capabilities in enhancing innovation performance, several gaps remain.

First, existing studies theorise innovation capability as an outcome of a range of antecedents, yet literature lacks consensus and coherence in the conceptualisation of different antecedents leading towards innovation capability. Also, a large body of research has been devoted to either resource-based view (Mendoza-Silva, 2020; Lofsen, 2017; Abrantes et al., 2014; Kyrgdiou & Spyropoulu, 2013; Terziovski, 2009; Capaldo et al., 2003) or dynamics capability view (Daranco et al., 2022; Otache & Usang, 2021; Hanchi & Kerazi, 2020; Siahaan and Tan, 2020; Hermwati, 2019; Lawson & Samson, 2001). Notably, the existing literature does not identify the moderating role of the dynamic capability view in determining the innovation capability of organizations. Yet, dynamic capabilities will drive organizations to reform, renew and transform the existing organisational resources and capabilities to be compatible with the changes in the business environment (Teece et al., 1997). On the other hand, most of the studies conducted on antecedents of innovation capability (Daranco et al.,2022; Hanchi & Kerazi, 2020; Mendoza-Silva, 2020; Saunila, 2019; Saunila, 2015) lack empirical validity.

Second, a large body of work articulates the outcomes of innovation capability in relation to financial and/or operational performance. Hence, most of these outcomes are randomly picked from subjective and/or objective organizational performance measurements. Only a limited number of studies (Wang & Ahmed, 2004; Kyrgidou & Spyropoulou, 2013) have focused on the impact of innovation capability on product and process innovations. Thus, there are inconsistencies in the findings of outcomes of innovation capability.

Third, the existing literature predominantly recognizes the antecedents and subsequent contribution of innovation capability in the context of large-scale organizations. However, SMEs are not miniaturing large companies. Therefore, the antecedents determining the innovation capability of large-scale organizations may not be generalizable to SMEs. Therefore, a gap exists in the literature related to antecedents of innovation capabilities in SMEs. On the other hand, the few studies conducted on SMEs have investigated SMEs in developed countries such as Australia (Terziovski, 2009), China (Liu, 2020), Sweden (Lofgren, 2014), Finland (Saunila et al., 2014), and United Kingdom (Romijin & Albaladejo, 2002). Thus, the antecedents pertaining to a developing country context of SMEs have been unexplored and under-researched. However, there are studies that have been conducted in Indonesia (Sihan & Tan, 2020; Purwati et al., 2021) and Ghana (Otache & Usang, 2021). Yet, the conceptualisation of antecedents was based on a single theory rather than evaluating the interaction between different theories.

Subsequently, to address the above gaps in the literature, this study's objectives are twofold. First, the authors unify the resource-based view and dynamic capability view to conceptualise antecedents of innovation capability, thereby, proposing a novel theoretical framework for determining the antecedents of innovation capability. Accordingly, the proposed framework contributes to both SME and innovation literature by developing a unified framework of innovation capability by integrating a resource-based view and a

dynamic capability view. Second, the outcomes of innovation capability were measured using product innovations and process innovations in the context of manufacturing SMEs in Sri Lanka. Hence, the findings contribute to the literature on SMEs in developing country contexts.

2. Literature Review

2.1. Theoretical background

Innovation capability has gained a wider recognition within innovation management literature (Saunila & Ukko, 2014) to exemplify the variations of innovation performance between organisations (Lawson & Samson, 2001; Lin, 2007). Nevertheless, the articulation of antecedents of innovation capability has been challenging due to a lack of consensus within the literature (Saunila & Ukko, 2012). Predominantly, the theorisation of innovation capability has been based on the resource-based view (RBV) or dynamic capability view (DCV). Notably, innovation management literature borrows RBV from strategic management literature which theorises the dominant role of organisational resources in determining organisational competitiveness (Barney, 1991). Nevertheless, mere possession of resources fails to guarantee innovation capability, thereby demanding organisational capabilities enabling the organisation to respond to environmental dynamisms (Pisano, 2015). Yet, the literature on innovation management has continuously focussed on adopting one of the lenses, RBV or DC view. However, the strategic management literature theorises the complementary contribution of these two perspectives that will promote the organisational activities that will achieve a competitive edge (Lin & Wu, 2014). RBV will assist organisations in determining the resources to be acquired (Barney, 1991), whilst DCV will enable organisations to create, extend and modify this resource base (Teece et al., 1997).

2.2. Conceptual framework and hypothesis

Building on prior knowledge, this study proposes six antecedents of innovation capability based on a resource-based view and dynamic capability view as emphasised in the conceptual model in Figure 1.

First, strategy is known as a plan which has a consciously directed action towards dealing with a situation (Mintzberg, 1987). Similarly, innovation strategy determines the direction of organisations towards innovation management. Thus, innovation strategy is viewed as part of the organisation's development strategy. In fact, innovation strategy determines the product and process development potential of the organisations to differentiate themselves compared to the competitors. Hence, the innovation strategy will be future-oriented and will assess the emerging trends of customer requirements and evolving market opportunities to determine the organisational innovation direction. Therefore, innovation strategy is theorised as an antecedent of innovation capability.

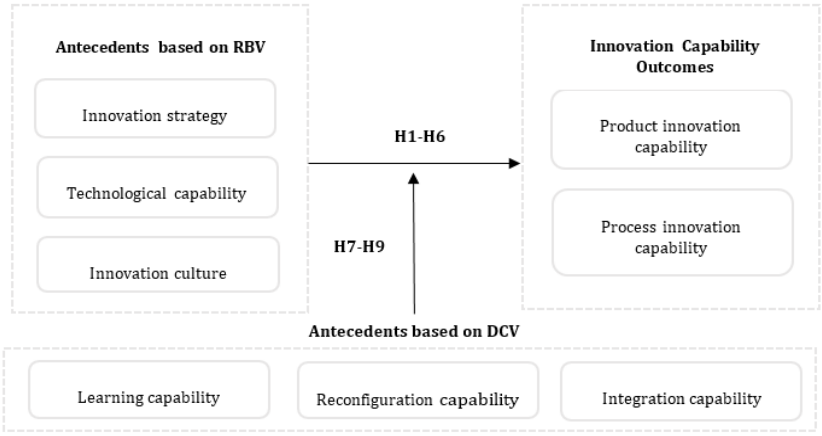

Figure 1. Conceptual framework.

H1: Innovation strategy positively influences the product innovation capability.
H2: Innovation strategy positively influences the process innovation capability.

Second, technical skills and technological advancements are integral in determining the exploitation of environmental opportunities in a timely manner. Therefore, organisational investments in technological advancements are likely to be a catalyst for driving the innovation capability of organisations. This is because enhancing the organisational technological capability will assist the internal knowledge transformation of organisations to be consistent with the ongoing market trends. Similarly, technological capability will be a driving force for enhancing the research and development capability of organisations as well. Hence, the organisations that are likely to exploit the advancement of technological capabilities are likely to yield higher rests pertaining to organisational innovation capability.

H3: Technological capabilities positively influence product innovation capability.
H4: Technological capabilities positively influence process innovation capability.

Innovation capability is nurtured within the organisation through creating a culture that promotes innovation. In fact, culture theorises the shared values, beliefs, and norms of the members of the organisation. Hence, through internalising innovation within organisational culture, the organisational members will be more receptive to new ideas and behaviours. Subsequently, the members of innovative organisational cultures will be open to change and will appreciate creativity and risk-taking which will eventually propel innovations within the organisation.

H5: Innovation culture positively influences product innovation capability.
H6: Innovation culture positively influences process innovation capability.

On the other hand, the organisational learning capability is determined as a key driver of driving innovations. This is because; the learning capability will enable the organisation to generate new knowledge that will enhance the existing resources of the organisation. Importantly, learning capability focuses on knowledge acquisition, assimilation, and

exploitation which would drive the new knowledge creation ability, thereby driving the organisational innovation potential.

H7: Learning capability will moderate the relationship between organisational resources, (a) innovation strategy, (c) technological capability, (e) innovation culture and product innovation capability.
H7: Learning capability will moderate the relationship between organisational resources: (b) innovation strategy, (d) technological capability, (f) innovation culture and process innovation capability.

Complexities and volatilities associated with the contemporary business environment demand organisations to rapidly change the existing resources to be compatible with environmental dynamism. Organisations which pursue the reconfiguration capability are likely to create new knowledge to meet the challenges postulated by the environmental dynamics. Subsequently, the rapid organisational responses to market changes drive the organisational ability to create new knowledge, thereby leading to organisational innovation capabilities.

H8: Reconfiguration capability will moderate the relationship between organisational resources, (a) innovation strategy, (c) technological capability, (e) innovation culture and product innovation capability.
H8: Reconfiguration capability will moderate the relationship between organisational resources: (b) innovation strategy, (d) technological capability, (f) innovation culture and process innovation capability.

Meanwhile, to deploy the reconfigured resources it is essential that organisations perceive integration capability. This is because; integration capability captures synergies amongst tasks and resources and interrelates between diverse inputs to jointly execute a collective activity thereby driving innovations.

H9: Integration capability will moderate the relationship between organisational resources, (a) innovation strategy, (c) technological capability, (e) innovation culture and product innovation capability.
H9: Integration capability will moderate the relationship between organisational resources: (b) innovation strategy, (d) technological capability, (f) innovation culture and process innovation capability.

3. Methodology

3.1. Measurement of the variables

All research constructs were borrowed or adapted from prior scholarly work. Accordingly, to measure the antecedents derived from the RBV lens the measurement scale was adapted from Chuang and Lin (2017) and Terziovski (2009). Likewise, the scale to measure the DCV constructs was borrowed from Farzaneh et al. (2020). Meanwhile, the performance outcomes of innovation capability were adapted from Wang and Ahmed's (2004) measurement scale and modified to the context of manufacturing SMEs.

3.2. Sample selection and collection

The population of the current study was the manufacturing sector SMEs in Sri Lanka. Accordingly, the sample frame consisted of 8734 manufacturing sector SMEs, operating in the Western province, listed in the Ceylon Chamber of Commerce. The managers, entrepreneurs or chief executive officers were selected as the key informants to gather the information in the sample of 369 organisations.

The questionnaire was developed in two phases. First, it was developed and pretested using eight independent respondents which included managerial-level individuals and business management academics. Afterwards, the questionnaire was modified to improve its structure, clarity, and applicability in the context of manufacturing SMEs.

Second, all 369 organisations were contacted through telephone to identify the key informants (Morgan et al., 2004) as well as to ensure that there were no changes in the business. Afterwards, the questionnaire and cover letter which included the purpose and objectives of the study were emailed to the key informants. Subsequently, the initial email was followed up by two email reminders and a telephone reminder resulting in 219 surveys completed representing a 59.34% response rate. Afterwards, the data was screened for absence bias using the ANOVA test (Armstrong & Overton, 1977) at a significant level of 5%. The results concluded that there was no significant difference between the three groups, the first emailing, the first follow-up, and the second follow-up, analysed. Further, considering the inequality of the responses in three groups considered post-hoc Turkey's b-test was performed at a significant level of 5% and results inferred that all variables were homogeneous between the groups considered.

Upon analysing for non-response biases, the data was screened for missing values and responses which included less than 2 missing values were replaced with the mode of the variable. Next Mahalanobis distance was calculated to clear out outliers. Accordingly, in two rounds of outlier cleaning 29 responses were removed thereby resulting in a final sample of 190 responses. Table 1 summarizes the characteristics of respondents in relation to turnover, number of employees and industry classification.

4. Results and Discussion

Data analysis was performed using structural equation modelling (SEM) and SPSS.PROCESS macro modelling which has been widely acknowledged for its utility and accuracy. Accordingly, the data was analysed using three phases: (a) the measurement model was analysed for confirmatory factor analysis (CFA); (b) the structural model was used for hypotheses testing; and (c) SPSS.PROCESS macro was used to evaluate the moderating impact of variables on innovation outcomes.

Table 1. Respondent characteristics.

Demographic Criterion	Frequency	Percentage
a) Turnover		
Less than LKR Mn. 15	23	12.11%
LKR Mn. 16-250	167	87.89%

LKR Mn. 251-750	0	0%
b) Number of Employees		
Less than 10	18	9.47%
11-50	172	90.53%
51-300	0	0%
c) Industry Classification		
Textile and apparel industry	48	25.26%
Surgical gauze industry	15	7.89%
Leather and footwear industry	18	9.47%
Edible products, including milk/fish-based products industry	97	51.05%
Gem and jewellery industry	12	6.32%

4.1. Measurement model

Prior to the assessment of the structural model, the measurement instrument must be validated for path significance and R-square measures. Accordingly, Table 2 presents the standardized loadings and other series of statistical analysis deployed to validate the measurement model. All items in the measurement model exhibited factor loadings ranging from 0.701-0.843 revealing a high degree of influence on the latent variables. Hence, the variables were considered acceptable for the remainder of the analysis. Likewise, composite reliability metrics of all first-order constructs, ranging from 0.772-0.789, were above the recommended threshold of 0.7 (Straub et al., 2004), hence, were acceptable. Similarly, Cronbach's alpha was used to assess the instrument reliability and Nunnally (1978) suggested a threshold of 0.7 as acceptable as these instruments were borrowed from previous studies. Accordingly, Table 2 shows that all constructs were above the threshold of 0.7, ranging from 0.837-0.915.

Table 2. Factor loadings of the measurement model.

Factor loading		**AVE and reliabilities**	
Item and construct reliability for innovation strategy			
Our firm is future-oriented	0.770	AVE	0.618
Our firm tries to forecast beforehand future market trends for potential innovations in products, processes, business models and markets	0.808	CR	0.786
Our firm investigates continually for potential products that will provide competitive superiority in the future	0.750	Cronbach's alpha	0.906
Our firm's marketing research activities focus on acquiring knowledge about future customer needs	0.742		
Our firm focuses on developing the quality and performance of current products continually	0.840		
Our firm emphasises using modern management techniques	0.803		
Item and construct reliability for technological capability			
R&D activities are very important for our firm	0.746	AVE	0.606
Advanced technologies and methods are used to develop new products in our firm	0.793	CR	0.779
New technologies are integrated into our firm rapidly	0.780	Cronbach's alpha	0.837
Our firm is an initiator of the development of new technologies for product and process enhancement	0.741		
Our organisation considers the use of technology as one of the key drivers of business innovation	0.830		
Item and construct reliability for innovation culture			

Workers of our firm are supported and encouraged to participate in activities such as product development, innovation process improvement and to produce of new ideas	0.767	AVE	0.596
Our firm has an organisational culture and a management comprehension that support and encourage innovation	0.825	CR	0.772
Our employees collaborate to diagnose and generate novel solutions to problems (issues or improvements).	0.770	Cronbach's alpha	0.915
Our culture rewards behaviours that relate to creativity and innovation	0.780		
Our employees at every level are continuously encouraged to take risks to research new ways of doing things or adopting their own approach to the job	0.782		
In our company, we tolerate individuals who do things in a different way	0.701		
Item and construct reliability for product innovation			
In new product and service introductions, our firm is often first-to-market	0.772	AVE	0.622
Our new products and services are often perceived as very novel by customers	0.780	CR	0.789
Our recent new products and services include big changes from our previous products and services	0.810	Cronbach's alpha	0.862
In comparison with our competitors, our firm has introduced more innovative products and services during the past five years	0.735		
In comparison with our competitors, our firm has a higher success rate in new products and services launch	0.843		
Item and construct reliability for process innovation			
In new product and service introductions, our firm often uses cutting-edge technology	0.822	AVE	0.607
We are constantly improving our business processes	0.761	CR	0.779
During the past five years, our firm has developed many new management approaches	0.784	Cronbach's alpha	0.865
We are constantly improving our business processes to improve the quality and speed of production	0.739		
Our company changes production methods at a great speed x in comparison with our competitors	0.754		
When we see new ways of doing business activities, we are often first to adapt them	0.812		

4.2. Structural model

To test H1-H6, as in Figure 2, a structural equation model was run using AMOS 24 and examined the relationship between constructs developed by the study.

The path coefficients of the causal relationship between constructs are illustrated in Table 3. The model exhibited good overall fit: Chi-square/df = 2.321, CFI = 0.938, TLI = 0.921, RMSEA = 0.076. Subsequently, the results exhibited in Table 3 show that all construct paths are significant ($p<0.05$). Hence, it was concluded that the antecedents, innovation strategy, technological capability, and innovation culture, directly and positively influence the organisational product and process innovations.

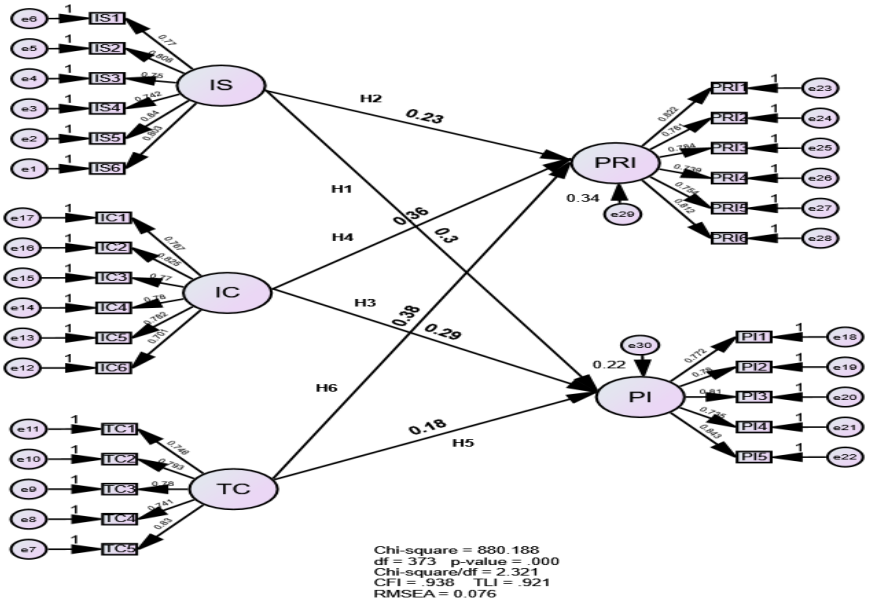

Figure 2. Structural model.

Table 3. Standard estimations of the structural model.

Hypothesis	Path	Estimate	SE	CR	p-value	Accept/reject
H1	IS→PI	0.345	0.75	4.576	0.000	Accepted
H2	IS→PRI	0.269	0.73	3.695	0.000	Accepted
H3	IC→PI	0.458	0.81	5.675	0.000	Accepted
H4	IC→PRI	0.428	0.79	5.383	0.000	Accepted
H5	TC→PI	0.120	0.51	2.359	0.018	Accepted
H6	TC→PRI	0.230	0.79	2.898	0.004	Accepted

4.3. SPSS.PROCESS model

To test H7-H9 SPSS.PROCESS modelling was run to estimate the direct and indirect effects of moderators. Subsequently, the results, presented in Table 4, revealed a positive and significant moderating impact pertaining to the relationship between resource-based view dominant antecedents of innovation capability and product and process innovation capability.

4.4. Discussion

This study analysed the factors determining the innovation capability in SME sector organisations and the consequent outcomes of the innovation capability. Accordingly, the findings of the study suggest that innovation strategy, technological capability and innovation culture support product and process innovation outcomes. In addition, this study theorised the moderating role of learning capability, reconfiguration capability, and integration capability in influencing innovation outcomes. However, empirical evidence suggests that previous studies have adopted either RBV or DCV in determining the antecedents of innovation capability. The current study is the first to provide evidence that the impact of RBV can be positively moderated by DCV in the SME context. Therefore, to drive the innovation outcomes of organisations, SMEs must identify valuable resources

Table 4. Statistical data for assessment of moderating effect.

Hypothesis	Path	Moderator	Estimates of path coefficients	Standard errors	t-value	p-value	R-squared
H7(a)	IS→PI	LC	0.748	0.315	2.373	0.022	0.1726
H7(b)	IS→PRI	LC	0.172	0.266	2.404	0.003	0.0856
H7(c)	IS→PI	RC	0.361	0.200	2.001	0.047	0.0317
H7(d)	IS→PRI	RC	0.523	0.063	8.215	0.000	0.0498
H7(e)	IS→PI	INC	3.848	1.143	2.479	0.013	0.1386
H7(f)	IS→PRI	INC	2.606	1.051	2.023	0.026	0.1916
H8(a)	IC→PI	LC	2.223	1.881	2.817	0.033	0.0992
H8(b)	IC→PRI	LC	0.094	0.034	2.755	0.006	0.3641
H8(c)	IC→PI	RC	0.206	0.092	2.238	0.026	0.1258
H8(d)	IC→PRI	RC	1.404	0.137	2.949	0.094	0.2567
H8(e)	IC→PI	INC	2.751	0.998	2.032	0.072	0.2132
H8(f)	IC→PRI	INC	0.871	0.376	2.371	0.031	0.1238
H9(a)	TC→PI	LC	0.751	0.322	2.279	0.027	0.1134
H9(b)	TC→PRI	LC	1.368	0.145	2.478	0.087	0.1874
H9(c)	TC→PI	RC	0.427	0.274	2.034	0.036	0.1427
H9(d)	TC→PRI	RC	2.321	0.784	2.117	0.004	0.1812
H9(e)	TC→PI	INC	0.012	0.038	2.648	0.038	0.3425
H9(f)	TC→PRI	INC	1.278	0.247	4.235	0.000	0.1165

and capabilities and deploy them effectively to achieve innovation outcomes. Notably, the complementarity between RBV and DCV in innovation literature exhibits synergistic value in creating innovation outcomes.

5. Conclusions and Implications

This study demonstrated that the RBV and DCV can complement each other to model the antecedents of innovation capability and performance outcomes of innovation capability. Accordingly, this study proposes a conceptual framework that draws on antecedents of innovation capability from RBV and DCV lenses. In fact, through adapting the theoretical lenses of RBV and DCV this study outlines the differential contingent impact on product and process innovation outcomes. Subsequently, the findings provide important theoretical and managerial implications for managing innovation in SMEs.

5.1. Theoretical implications

This study contributes to existing literature in three ways. First, this study attempts to fill the gap in the literature by determining key antecedents of innovation in developing country context SMEs and their performance outcomes. Notably, the conceptual model presented in this paper is theoretically grounded and empirically validated thereby contributing to the existing innovation management literature. Second, this paper deepens the understanding of determinants of innovation capability by identifying thematic patterns in previously theorised antecedents and synthesising them into three core determinants, namely, innovation strategy, technological capability, and innovation culture. Hence, findings lend support to prior research in achieving consensus on antecedents of innovation capability. Third, through this study, the author conceptualized the significant role dynamic capabilities will play in determining organisational

innovation performance. In fact, theorizing based on strategic management literature and innovation management literature the author conceptualized a model integrating both RBV and DCV which will be a novel contribution to the existing literature.

5.2. Managerial implications

First, this study enhances the innovation management literature by conceptualizing a novel model which emphasizes the moderating role of dynamic capability on innovation outcomes. Thus, the findings of the present study provide insights to managers of the SMEs sector in promoting product and process innovations. Subsequently, to respond to the contemporary environmental dynamism the findings of the study support as it emphasizes the moderating role of dynamic capability in positively promoting innovation outcomes. Therefore, the findings suggest that organisations are less likely to achieve innovation outcomes through embracing static resources, hence, through developing dynamic capabilities these resources can be exploited to generate positive outcomes. Similarly, the findings of the study emphasize the importance of dynamic capabilities in driving innovation outcomes. Notably, managers must embrace these dynamic capabilities by nurturing them into the organisational culture to achieve a sustainable innovation outcome for the organisation. Likewise, the findings theorise the importance of innovation strategy, innovation culture and technological capability in driving innovation performance. Therefore, SMEs need to strategize innovation activities to nurture a culture of innovation that will enhance innovation outcomes. Moreover, the strategizing will drive the ability of the organisation to adapt to modern technology as well.

5.3. Limitations and future research

In this study, the following limitations were encountered. First, Sri Lankan organisations pursue a laid-back approach pertaining to innovations. Therefore, conducting the research focused only on Sri Lanka can be identified as a limiting factor. Hence, to enhance the generalisability of the findings it is essential to replicate the study in other markets as well. Notably, this will enable results to be valid and transferable in different country contexts. Also, the primary data was collected using a cross-sectional research design, thereby gathering data based on one point in time. Hence, the ability to make causal inferences based on the conceptual model may be questionable. Therefore, this study needs to be reproduced as a longitudinal study in future. Third, the findings of the current study evaluated the outcomes of innovation capability based on product and process innovation capability. Yet, the innovation outcomes could be measured based on other forms such as market innovation capability, strategic innovation capability, and behavioural innovation capability. Hence, these could be conceptualised in future studies. Moreover, the present study focussed only on the manufacturing sector in Sri Lanka, therefore, generalizability to all SMEs is challenging. Therefore, it is important to extend and validate the conceptual model in the context of service organisations as well. Finally, the present study adopted the lenses of RBV and DCV only. In future, the study could be enhanced to include the moderating role of a knowledge-based view and to evaluate the external environmental dynamics influence on innovation outcomes of organisations.

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