


Article

The Impact of Managerial and Adaptive Capabilities to Stimulate Organizational Innovation in SMEs: A Complementary PLS–SEM Approach

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Abstract: The aim of this study is to empirically explore and propose a rigorous model for the positive impact of managerial capability (in terms of decision-making, management style, people development, and succession planning) and adaptive capability (in terms of horizon scanning, change management, and resilience) on organizational innovation in the context of small and medium-sized enterprises (SMEs). The study uses partial least squares structural equation modeling (PLS–SEM) to test the model hypotheses, and importance-performance matrix analysis (IPMA) to provide information regarding the significance and relevance of the dimensions of managerial and adaptive capability in explaining organizational innovation in the proposed model. The empirical data is gathered through questionnaires from 210 SMEs. The results show a strong and significant relationship between managerial capability, adaptive capability, and organizational innovation. This study found that all of the dimensions of managerial capability and adaptive capability help to develop and improve the performance of organizational innovation in SMEs. The study concludes with a comprehensive discussion of the research limitations, and provides suggestions for future research.

Keywords: managerial capability; adaptive capability; organizational innovation; small and medium-sized enterprises (SMEs); partial least squares structural equation modeling (PLS–SEM)

1. Introduction

Innovation drivers of small and medium-sized enterprises (SMEs) originate from a spectrum of scattered factors, including severe competition from globalization, which exposes SMEs to new competitors, new market niches, rapid technological progress, and customers' demands for new high-quality products and services at a low price [1]. To sustain increased competitive pressure, SMEs are continuously forced to rethink, reshape, and synchronize their existing competitive sources and capabilities. Innovation studies, especially on SMEs, have sought to explain and explore how to create an innovation-friendly environment, and highlight the key determinants of organizational innovation. However, how innovation occurs, the capabilities within a firm that stimulate organizational innovation, and the relationship between the two still remain challenging areas. Although there is a wide range of organizational capabilities and related variables, many studies have failed to integrate all of the relevant capabilities comprehensively. An integrated and comprehensive framework is thus needed to transform the SMEs.

These new circumstances are compelling SMEs to analyze, integrate, build, and reconfigure their resources and organizational capabilities in order to achieve and sustain a competitive advantage in the form of organizational innovation. Organizational capabilities are now being considered a vital

ingredient for competitiveness. Therefore, building organizational capabilities is the key success factor to stimulate organizational innovation in SMEs. However, past research has offered moderately little in terms of comprehensive explanations concerning organizational capabilities and how they can stimulate organizational innovation, particularly in SMEs [2–8].

Indeed, innovation capability is considered the most valuable and inevitable source of growth, competitiveness, and long-term sustainability. Researchers and practitioners have shown that innovation is not merely dependent on research and development (R&D), but also on having an enabling environment within a firm [9]. Seamless and continuous innovation is the only way to sustain competitive performance, which is among the most important factors that provide unique competitive advantages. Therefore, the ability to innovate not simply at times, but rather frequently, rapidly, and with a firm success rate is one of the most profound variables affecting a firm's ability to compete [10]. Day [11] proposes that organizations can become more market-oriented by recognizing and developing special capabilities. The research defined the term “capabilities” in a rational manner as: an aggregate learning and complex group of skills achieved via organizational processes that guarantee the predominant coordination of functional activities. The resource-based view (RBV) theory [12] and dynamic capabilities (DC) [13] perspective have also highlighted the vital role of capabilities development for sustainable competitive advantage. However, most of the literature on dynamic and organizational capabilities consists of descriptive studies rather than empirical findings [4,6,14–18]. The majority of empirical studies are case studies [15,19,20]. Empirical studies that feature more quantitative approaches are still needed to provide more academic rigor to this concept, especially in developing countries.

Integrative capability as highlighted by Jian Yu [21] is a kind of systematic capability to collect, configure, and reconfigure all of the resources that can provide competitive advantages, and can be divided into four capabilities: (1) scanning capability; (2) gathering capability; (3) organization capability; and (4) innovation capability. Therefore, integrative capability is a prerequisite for sustainable organizational innovation, which enables the firm to identify and absorb knowledge from both internal and external sources in order to compete in the ever-changing market [22]. Integrative capability is the vital determinant of a firm's growth as it integrates different tangible and intangible resources. Adaptive capability can guide the way a firm interacts with external entities such as market scanning [14,23], customers, competitors, and technology scanning [14,24,25], and also help manage and reshape internal entities such as change management and resilience [26–28]. Furthermore, the reconfiguration of resources is focused through adaptive capabilities, which in turn enable processes to respond to peripheral changes [29]. Under this perspective, dynamic managerial capability plays a vital role, as the management seeks to reconfigure and modify existing organizational capabilities in an environment where limited and time-bound information is available both on the firm's capabilities and on the nature of environmental change [30]. Therefore, the development of a firm relies on the existing experience and learning of the managers, since they are the enablers of organizational capability [31]. Managerial capability relies on more than just cognition; it also requires the understanding of human emotions, and non-cognitive processes that develop and enable strategic adaption behaviors (adaptive capability) in volatile environments [32,33].

Against this background, the prime concern of this study is to explore the relationship between organizational capabilities—specifically managerial capability and adaptive capability—and the related key elements that are essential to stimulate organizational innovation in SMEs. A rigorous capability model is also proposed and validated using structural equation modeling. This study makes three contributions. First, this study sheds light on the conceptualization of managerial capabilities as the consideration of four dimensions, i.e., decision making, management style, people development, and succession planning. Second, adaptive capability is conceptualized as the consideration of three dimensions, i.e., horizon scanning, change management, and resilience. Third, the objective of this study is to investigate the relationship between organizational capabilities and the related key elements that are essential to stimulating organizational innovation in SMEs. In particular, the purposes of this

study are: (1) to examine the relationship between managerial capability (in terms of decision-making, management style, people development, and succession planning) and adaptive capability (in terms of horizon scanning, change management, and resilience); (2) to examine the relationship between adaptive capability and organizational innovation; and finally, (3) to examine the relationship between managerial capability and organizational innovation. Essentially, this study aims to integrate two vital aspects related to firms, which provide the theoretical framework and the research model for this study. The work presented here examines the antecedent part of a resource-based view (in this case, managerial and adaptive capabilities) in the development of dynamic capabilities, and its effect on achieving capabilities-based resources (in this case, organizational innovation) using a theoretical capabilities-based view as a theoretical framework.

Finally, this study sheds light on business sustainability in relation to ever-changing competitive forces by providing a robust and holistic capability-based view framework to diagnose weak capabilities and ineffective resources. Business sustainability is not just about environmental, social, and economic needs; it also guarantees the responsible, ethical, and continuing success of the business. Innovation is also considered to be vital for securing long-term sustainable development [34]. Business sustainability is also a holistic approach, as it is linked with three strategies: (1) to maximize profit through achieving competitive advantage; (2) to develop employees (people); and (3) to preserve the environment by recycling/reusing natural resources. Embracing sustainable principles can boost workforce morale and innovation. Sustainability can be the driver for innovation [35]. The proposed framework help SMEs' management work on these approaches by developing people and other key capabilities that will enable the achievement of a sustainable competitive advantage and overall organizational innovation.

The study proceeds as follows. Section 2 provides an overview of the development of the conceptual model and research variables. Section 3 presents the development of the hypotheses. Section 4 comprises a description of the research methodology. Section 5 presents the analysis and the results from the empirical data. Finally, Sections 6 and 7 bring together the discussion, conclusion, and implications.

2. Conceptual Model Development and Research Variables

The intersection of the resource-based view (RBV), dynamic capability, and the organizational capability perspectives of a firm provides the theoretical foundation for this study. RBV has the capacity to convey a more precise way to deal with firm-level investigation by portraying the firm as an accumulation of resources and capabilities [2,36], but does not contain the particular resources required for transformation. The dynamic capability point of view conquers that downside by characterizing the firm as the collection of aggregated tangible and intangible resource stocks [12,37], which can be converted to capabilities. To achieve this viewpoint, firms must recognize, adjust, participate, and reorder their resources on a frequent basis, in order to adapt and respond to the varying market trends [13].

SMEs can identify the potential to change, but most of the time, the management does not know how to react to that change. Instead, they fail to build the organizational capability, which is the firm's ability to deploy or reconfigure its tangible and intangible resources in order to improve performance [13,38,39]. The most recent study by Inan and Bititci [6] that focused on SMEs further divided organizational capabilities into two categories: dynamic and operational.

2.1. Managerial Capability

Adner and Helfat [30] described managerial capabilities as the abilities of management to integrate and reconfigure organizational resources and competencies. In this study, managerial capability refers to the strengths of managers to generate a healthy and friendly workplace that not only attracts employees, but also facilitates and motivates them. Furthermore, it also encourages employees towards personal growth, which in turn enhances business performance and helps in achieving targeted goals.

Managerial capability is conceptualized as the consideration of four dimensions: decision-making, management style, people development, and succession planning [33].

Decision-making is the process of making a decision that is aligned with the firm's vision and strategy. Effective and collaborative decision-making is an integral element of managerial capability [40]. Kunc and Morecroft [41] highlighted managerial decision-making processes under a resource-based paradigm, and the relationship of decision-making to resource building and organizational innovation.

Management style has been highlighted as a promoter of organizational change, because it helps to achieve the organization's values, mission, and vision. Management style is about strengthening and influencing employees to achieve business targets, and in parallel, ornamenting their individual development in a way that brings positive energies to their professional attitudes and uplifts motivation and creativity. Therefore, a positive management style acquires consensus and teamwork, rather than enforces command and control. A positive leadership style motivates employees to look beyond their own interests and think outside of the box in regards to their routine tasks [42,43]. Both transformational and transactional leadership styles are appropriate for SMEs in their own context. The relationship between a leader and their followers is very crucial and important in SMEs, because of the fewer hierarchical layers [44]. A positive leadership style encourages individuals to think further, look at problems from different angles, and innovate through providing an environment where innovative ideas are recognized and rewarded [45].

People development refers to implementing a knowledge-based atmosphere that enables managers, team leaders, and other employees to acquire sufficient information, skills, and deep insights. This development is necessary for the individual as well as for the collective transformation of a workplace, as it produces a mindful workplace. The RBV emphasis that the firm achieves competitive advantages through integrating and effectively positioning their human and organizational resources in a manner that is hard for market competitors to intimate [12,46].

Succession planning is a systematic process of recognizing and developing future business leaders to grow competitive advantage-based knowledge. Successful succession planning is a critical issue for SMEs [47]. To perform better, a firm needs more than resources and capabilities; it also requires the tacit knowledge that is embedded in firm's routine in order to successfully coordinate and mobilize existing and future resources and capabilities [39]. A knowledge-based approach helps the analysis of how firms create, acquire, apply, and transfer knowledge. Transferring knowledge internally sets the basis for innovating and improving efficiency, which is another key for succession development in SMEs [48].

2.2. Adaptive Capability

Adaptive capability is firmly connected to an organization's strategic plan to respond to changing business requirements by identifying and nurturing its key capabilities, resources, and other organizational processes [13]. Paliokaite [49] suggested that adaptive capability offers a competitive advantage, particularly in continuously changing environments. Adaptive capability is conceptualized as the consideration of three dimensions: horizon scanning, change management, and resilience.

A varying resource base is a crucial antecedent to adaptive capability. The dynamic examining and scanning of market conditions is an integral part of adaptive capability [50], which consists of investigating strong and weak tie sources [51]. Horizon scanning is the continuous process of gathering information about customers, suppliers, competitors, society, and technology, and using this information to make informed decisions.

Change management is associated with amendments to objectives, plans, structures, and governance systems [52] based on the horizon-scanning information. The magnitude of adaptive capability depends on changes in market/product expectations [53], and the firm's ability to meet those expectations with its existing resources and capabilities [54]. Change management is a structured

process for managing organizational and/or technological change. Therefore, any change in the firm's previous resource base and new resource combinations correlate with a change in its adaptability [53].

Resilience is the firm's ability to endure disruptions of all types [55,56]. It could be viewed as adaptability, responsiveness, and the ability to vigorously revamp the business and strategies as the circumstances change before the case for change becomes desperately obvious [28,57].

2.3. Organizational Innovation

Organizational innovation is a holistic process of innovation that involves generating, selecting, developing, and implementing ideas [58]. Organizational innovation is not just innovation as discussed in the literature, which focuses primarily on either a new product or process development, but rather a system-wide approach that examines innovation at the strategic level [59]. Organizational innovation is the "ability of [a] firm to introduce some new process, product, or idea in the organization [60,61] that leads to strategic outcomes which are beyond mere innovation" [62]. According to this point of view, innovative and agile organizations always keep themselves ahead of their competitor and rivals by focusing on and developing key organizational capabilities and resources [7,9,63].

In this study, organizational innovation represents holistic innovation activities ranging from the participatory creation and implementation of new products, services, and ideas in the marketplace, to developing an ability to foresee customer requirements and respond better than competitors. Organizational innovation is also measured according to how the business is managing the innovation process.

3. Hypothesis Development

In the light of the past research discussed above, our underlying model was developed by categorizing managerial capability, adaptive capability, and organizational innovation. The dimensions of both managerial and adaptive capabilities are proposed to influence organizational innovation in the context of SMEs. Investigating these variables within a causal model sheds light on the interrelationships between these variables, in addition to helping explain organizational innovation in greater detail. The proposed model is presented in Figure 1.

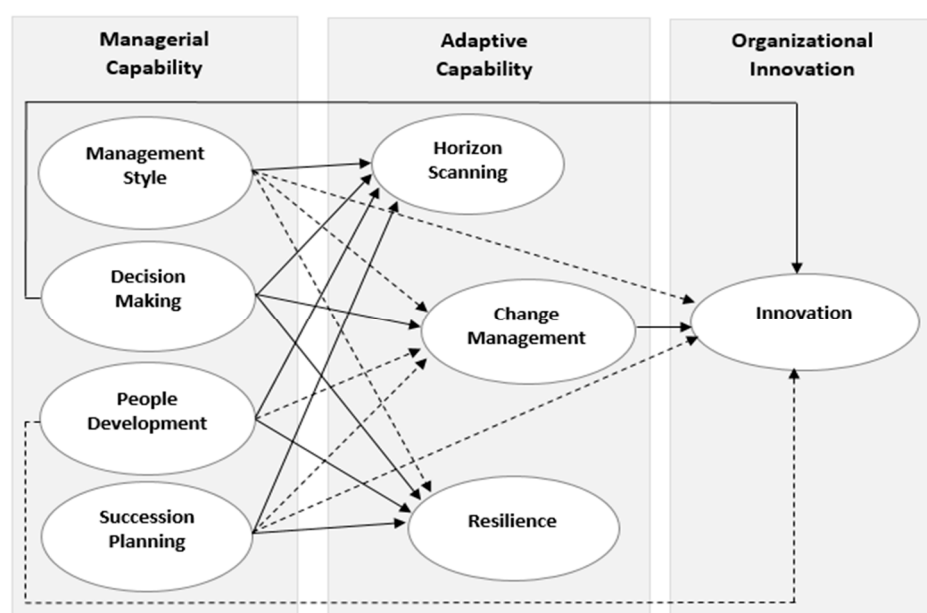


Figure 1. Proposed research model (with significant and non-significant paths). Note: All arrows indicate hypothesized positive relationships. —→ Suggested relationship confirmed in the model. - - - - -→ Suggested relationship rejected in the model.

3.1. Managerial Capability and Adaptive Capability

Managerial capability encourages management to accumulate and analyze information from internal and external sources in order to mine the evolution of technologies as well as changing customer needs and requirements [64]. This involves observing and examining both internal and external technological advancements and business techniques. Here, managers' capabilities that have been developed through training and skill development help management anticipate change, as well as which parts of the firm will be affected by approaching change. Change is accompanied with crises that need timely and well-contextualized decisions. Pal [65] argued that the three major responsibilities of leadership are to envision change, engage and tackle the change, and act as resilient as possible.

Many studies under the umbrella of RBV and DC emphasize employee training and qualifications as ways of achieving competitive advantages [46,66–68]. Empirical studies show that firms use training and skill enhancement programs to develop human resources that can respond to the changing business environment by scanning the market and other external sources [69]. Better-trained workers perform more productively, and they are also more motivated, valuable, and ready to take on more responsibility [70]. Human capital is one of the pivotal types of knowledge resource that resides within individual workers [71]; it encompasses both tacit and explicit knowledge, which enhance their ability to generate knowledge that could be used to achieve organizational innovation [68]. Other essentials of human capital include experience, industry knowledge, creativity [69], teamwork, competence, training, loyalty, and contributions and commitment to business missions, goals, and objectives [68,72]. Also, the management has to develop future leaders based on the gathered information in order to anticipate future needs and continue the competitive advantage based on knowledge acquired over time.

To summarize, after considering the three elements of adaptive capability, we consider that managerial style, decision-making, people development, and the succession planning of managerial capability are strongly associated.

Hypothesis 1 (H1). *Managerial capability will affect adaptive capability. In particular:*

Hypothesis 1a (H1a). *Management style is positively linked to change management, horizon scanning, and the resilience of adaptive capability.*

Hypothesis 1b (H1b). *Decision-making is positively linked to change management, horizon scanning, and the resilience of adaptive capability.*

Hypothesis 1c (H1c). *People development is positively linked to change management, horizon scanning, and the resilience of adaptive capability.*

Hypothesis 1d (H1d). *Succession planning is positively linked to change management, horizon scanning, and the resilience of adaptive capability.*

3.2. Adaptive Capability and Organizational Innovation

SMEs are highly vulnerable in times of crisis [73], and their relative strength is measured in terms of adaptability, resilience, and innovation. Extreme rivalry and technological development make it difficult to point out the specific external resources that facilitate innovation for current or emerging markets [13]. Therefore, firms need scanning capabilities to figure out valuable sources in order to gain competitive advantages and the knowledge required for creativity. Hence, to achieve and stimulate organizational innovation, firms require the continuous observation and monitoring of business markets and technological advancements [13].

Hamel and Valikangas [57] suggested that being proactive required resilience, which is the ability to change before the case for change becomes desperately inevitable. External systems and sources can furnish firms with access to new information and technological advancements [23]. Scanning the environment can increase the amount of ideas; therefore, the more a firm scans the external environment, the more access it will obtain to new knowledge, which can stimulate organizational innovation. Horizon scanning is positively related to product innovation in SMEs [49]. Gracht [74] stated that horizon scanning better contributes to organizational innovation, provided two requirements. First, the gathered information can inspire and create new ideas; second, it can help evaluate the exciting products and processes. Many other studies have also explored the relationship between resilience and innovation. Gunasekaran [28] argued that resilience is positively related to competitive advantage and innovation. Based on the above literature discussed, we hypothesize that adaptive capability is positively linked to organizational innovation.

Hypothesis 2 (H2). *Managerial capability will affect organizational innovation. In particular:*

Hypothesis 2a (H2a). *Change management is positively linked to organizational innovation.*

Hypothesis 2b (H2b). *Horizon scanning is positively linked to organizational innovation.*

Hypothesis 2c (H2c). *Resilience is positively linked to organizational innovation.*

3.3. Managerial Capability and Organizational Innovation

Organizational innovation is an extensive and multifaceted process, and managerial capability plays a crucial role in its accomplishment, as leaders can affect employees' innovative behaviors through their thoughtful engagement, which can stimulate idea generation [45]. Therefore, to leverage the innovative and creative potential of employees, and motivate them to think outside of the box, there must be an innovation-friendly culture that supports as well as rewards every initiative regarding innovation [42].

Leadership plays a vital role in the success of product innovation [45,75], whereas process innovation requires the capability to manage resources efficiently [9]. Leadership style and human resources both have a positive relationship with achieving organizational innovation [76,77]. Many other studies also argue that leadership is positively linked to organizational innovation [78–80].

Participatory decision-making accelerates the decision-making process, and imparts a sense of ownership in involved employees. Zehir [81] argues that decision-making is positively related to the innovative performance of employees.

Hypothesis 3 (H3). *Managerial capability will affect organizational innovation. In particular:*

Hypothesis 3a (H3a). *Management style is positively linked to organizational innovation.*

Hypothesis 3b (H3b). *Decision-making is positively linked to organizational innovation.*

Hypothesis 3c (H3c). *People development is positively linked to organizational innovation.*

Hypothesis 3d (H3d). *Succession planning is positively linked to organizational innovation.*

4. Research Methodology and Measurement

4.1. Data Collection and Sample

This study is based on quantitative and causal research, which involved hypotheses and theories that test the causal relationship between predictors and criterion variables [82]. We investigated manufacturing SMEs in light of firm-level information gathered from two different regions of Pakistan. This study adopted the cross-sectional method to gather data over a single period of time. An online survey was designed to collect information about the organizational innovation performance of the firms in the context of the managerial and adaptive capability of individual manufacturing firms. The data provided relevant information about the firms' innovation processes, and how the innovation processes were being managed. We focused on the most developed part of Pakistan in terms of industry in order to get the insights of SMEs in that particular region. At the completion of the data collection phase, 210 responses from managers were found to be usable for the analysis within this study. Therefore, structural equation modeling (SEM) was adopted for both measurement analysis and testing hypotheses, by using partial least squares structural equation modeling (PLS-SEM) and path modeling.

4.2. Measurement Variables

An attempt was made to adapt measurement items from existing scales wherever possible. For new scale items, established procedures for new scale development were used [83,84]. To start, a theoretical model was created based on an extant literature review. Organizational innovation was treated as a dependent variable, whereas managerial and adaptive capability were independent variables, incorporating all research hypotheses (Figure 1). Next, the content domains of the constructs were specified, followed by selecting scales from a pool of potential items gathered from relevant studies, as shown in Table 1. The underlying pool was refined in light of feedback and criticism from specialists in the field, and the results are in the final draft of the questionnaire. Based on the arguments of Churchill, Gerbing and Mowen [85–87], the validity was preserved in a rigorous process. Several discussions and reflections on the initial draft with a professor, five Ph.D. students, and one professional in the study matter, ensured the instruments' content validity. A pre-test was carried out by 10 professionals who discussed and reflected in order to verify the validity of each question, and suggested some modifications or enhancements. Also, the five academic specialists evaluated the questionnaire and offered remarks. Therefore, a few adjustments were made to the questionnaire as indicated by their remarks to guarantee a consistency across the language and the general meaningfulness of each question. After going through this processing, the questionnaire was ready for the pilot study. The questionnaire items associated with all of the constructs of the theoretical model are shown in Table 1. A pilot study was administered to a convenience evaluation sample of 10 potential executives who were excluded from the final sample, in order to assess the content validity and other unpredictable problems related to field work (e.g., timing). Finally, after making some minor corrections, it was confirmed that all of the items were understandable, and respondents filled out the questionnaires successfully. To assess the four dimensions of managerial capability, the current methodology used six items to measure management style, five items to measure decision-making, eight items to measure people development, and four items to measure succession planning. Three dimensions of adaptive capability were assessed through using five items to measure horizon scanning, four items to measure change management, and five items to measure resilience. Finally, organization innovation was measured through 10 items. Since the respondents were fluent in the English language, and the past research has effectively employed English-language questionnaires in Pakistan [88,89], the questionnaires are not translated into Urdu. Five-point Likert-type scales (ranging from 1 = No to 5 = Yes) were used for every construct.

Table 1. A brief summary of definitions and literature sources for the main constructs.

Construct	Item No	Operational Definition	Sources
<i>Managerial capability</i>			
Management style	6	The management style of leaders/managers inside the business regarding their approach, needs, priorities, and communication with workers.	[43–45,77–79,90–92]
Decision-making	5	How and why decisions are made inside the business, and which stakeholders are involved.	[41,93,94]
People development	8	The business’s approach to developing its employees.	[46,95–98]
Succession planning	4	The selection and training of new leaders; also, how the succession plan works in the business.	[47,99–101]
<i>Adaptive capability</i>			
Horizon scanning	5	How the business comprehends what happens in the external business environment, and how this data is utilized.	[23,25,64]
Change management	4	How the business acts/reacts to internal/external changes, and how it manages the process of change.	[102–104]
Resilience	5	The business approach when things go wrong; also, how it survives and flourishes during crises.	[28,65,105–107]
<i>Organizational innovation</i>	10	How the innovation process is developed and managed.	[43,61,108–115]

5. Empirical Results and Analysis

This study employed a multivariate analysis technique, i.e., a PLS–SEM tool. More specifically, SmartPLS 3 [116,117] was used to estimate the research model (for detailed reasons of why and when to use PLS–SEM, see for example, Richter, Cepeda, Roldán, & Ringle [118]). Despite a surprising level of animosity towards PLS–SEM [118–121], PLS–SEM has been widely accepted by the scholarly community, including authors, reviewers, and editors [122–125]. The following points summarize why this study adopted PLS–SEM instead of Linear structural relations (LISREL) or Analysis of a moment structures (AMOS) as more suitable statistical techniques: (1) the structural model is complex, and contains four series of dependent relationships [118,126]; (2) the research objective of the structural model is prediction oriented, and explaining the variance in key target constructs [126,127]; (3) this study analyzes the relationships between managerial capability, adaptive capability, and organizational innovation; which is being considered in the initial stages of theory development, therefore motivated us to investigate the related phenomena in this emerging area [118]; (4) the sample size ($n = 210$) is also believed to be relatively small [127], finally; (5) this study also takes advantage of PLS–SEM in terms of its less rigorous requirements for restrictive assumptions, which motivates researchers to develop and estimate such models through enabling them to avoid additional limiting constraints [117,128].

5.1. Model Evaluation of PLS–SEM

The study embraces a two-step approach to examining and interpreting the PLS–SEM results: (1) evaluation of the measurement model; and (2) evaluation of the structural model.

5.2. Evaluation of the Measurement Model

The measurement model when employs PLS–SEM, the assessment of the individual reliability of the reflective items depends on examining the factor-loading values. In this study, in order to assess the validity and reliability of all of the reflective first-order items, an exploratory factor analysis was carried out, which confirmed the unidimensionality of the constructs. Generally, the factor loading of all of the reflective items was found to be above 0.70 or 0.50 which are significant at the 0.001 level (Table 1), except for the items: DM4, MS2, MS3, SP2, HS2, RE3, IN3, IN5, and IN7, which are less than 0.50, and were dropped in the final analyses to guarantee the convergent validity of the scales.

The measures for construct reliability (CR) and convergent validity (CV) represent measures of internal consistency reliability and validity for reflective items. Generally, measures of construct

reliability include Cronbach's alpha and composite reliability. This study reported both Cronbach's alpha and composite reliability, because Chin [129] recommended that researchers examine Cronbach's alpha, composite reliability, and average variance extracted (AVE) to assess reflective construct properties. Table 1 shows that all of the values of Cronbach's alpha and composite reliability are greater than or equal to 0.70, suggesting acceptable reliability.

Convergent validity (CV) is assessed by examining the average variance extracted (AVE), which provides the sum of variance that a construct gains from its items in relation to the amount of the variance due to the measurement error [130]. Table 2 shows that the values of average variance extracted (AVE) of all the constructs are greater than 0.50 at the construct level. Hence, the measurement model's convergent validity is acceptable.

This study uses three common approaches to examine discriminant validity: (1) the Fornell-Larcker criterion; (2) cross-loading; and (3) the heterotrait-monotrait (HTMT) ratio. Based on the results, the Fornell-Larcker criterion was examined by comparing the square root of average variance extracted (AVE) with the correlations between the focal construct and all of the other constructs. All of the the variables fulfill this criterion, because the square roots of each AVE are higher than the correlations between the other latent variables.

The cross-loadings of each item's outer loading on the related construct are greater than all of its loadings on other constructs (i.e., the cross-loadings) [131]. Finally, the results of the heterotrait-monotrait (HTMT) ratio confirm that none of the HTMT criteria are greater than 0.85 or 0.90 [116].

Table 2. Measurement model.

Constructs	Code	Items	SL	α	CR	AVE
<i>Managerial capability</i>						
Decision-making				0.72	0.82	0.54
	DM1	Leaders/managers delegate decision-making power to employees within their scope of responsibility.	0.82			
	DM2	All of the concerned stakeholders are involved, consulted, and asked for their opinion/feedback during decision-making.	0.74			
	DM3	All employees feel that their feedback/opinions are taken into consideration when decisions are made.	0.74			
	DM4 *	The management team becomes a bottleneck in decision-making.	0.44			
	DM5	Decisions are made with the vision of the business in mind.	0.63			
Management style				0.70	0.81	0.52
	MS1	Leaders/managers encourage open communication and feedback among all employees.	0.79			
	MS2 *	All employees can talk to their managers about any aspect of the business without fear of consequences.	0.49			
	MS3 *	Leaders/managers give all employees the opportunity to try new ways of doing things for the benefit of the business.	0.49			
	MS4	All employees are given responsibility/ownership for the delivery of key goals and objectives.	0.73			
	MS5	All employees know how their role contributes to the success of the business.	0.67			
	MS6	Leaders/managers regularly give praise to all employees for the work they have done.	0.70			
People development				0.83	0.87	0.50
	PD1	All employees have been adequately trained to do their job.	0.71			
	PD2	All employees are assessed for training or development needs.	0.69			
	PD3	All employees can suggest training or development opportunities for themselves.	0.64			
	PD4	There is a budget for the training and development of all employees.	0.61			
	PD5	Managers discuss career development with all employees.	0.65			
	PD6	All employees are given the opportunity to become multi-skilled.	0.69			
	PD7	All employees have regular staff appraisals (annual, biannual, etc.).	0.67			
	PD8	There is a formal appraisal process for all staff.	0.71			
Succession planning				0.70	0.77	0.53
	SP1	The management knows where there may be skill gaps in the business in the next two to five years.	0.67			
	SP2 *	The management team assessed the risk to the business of losing key employees at all levels.	0.34			
	SP3	The leader/manager has identified people in the business who can be developed into higher roles.	0.82			
	SP4	The management team discussed how the risk of losing key employees at all levels could be minimized, or how to react if it occurs.	0.69			
<i>Adaptive capability</i>						
Change management				0.77	0.85	0.60
	CM1	Once made, all changes are sustained.	0.83			
	CM2	There is continuous communication during change processes.	0.77			
	CM3	The change(s) happen quickly and effectively.	0.65			
	CM4	Following a change in the business, does the management team discuss how well it was executed?	0.80			

Table 2. Cont.

Constructs	Code	Items	SL	α	CR	AVE
Horizon scanning				0.71	0.82	0.54
	HS1	The information is gathered in a structured and deliberate way.	0.71			
	HS2 *	The information is stored in a location where relevant employees have access to it.	0.47			
	HS3	The information is communicated to the management team on a regular basis.	0.72			
	HS4	Opportunities and threats are identified from the information.	0.69			
	HS5	The management team knows the key trends and changes in the environment that could impact the business.	0.80			
Resilience				0.70	0.81	0.52
	RE1	The business has strong social connections.	0.72			
	RE2	The business finds it easy to adapt to changing situations.	0.74			
	RE3 *	The management team is optimistic, even when things are difficult.	0.49			
	RE4	The management team is usually calm in high-stress situations.	0.69			
	RE5	The leader/manager feels confident in the abilities of employees to tackle problems.	0.72			
Organizational innovation				0.86	0.90	0.55
	IN1	Employees in the business are always looking for new ways of doing things.	0.75			
	IN2	The business (management team) is open to making a change or implementing something new if an opportunity arises.	0.76			
	IN3 *	The business (management team) enter new markets/create niches in existing markets.	0.44			
	IN4	The information from the external business environment (e.g., customers, new technology, social trends, etc.) is used to initiate new products, services, or improvements.	0.76			
	IN5 *	The business (management team) invests (above the industry average) in new technology, research, and development or new product development.	0.46			
	IN6	Employees are rewarded for coming up with ideas.	0.67			
	IN7 *	The ideas are evaluated for their relevance/benefit to the business.	0.43			
	IN8	When an idea is deemed useful, it is taken to the development stage on a priority basis.	0.76			
	IN9	The one (employee) who suggested an idea(s) is also involved in the idea evaluation phase.	0.75			
	IN10	The one (employee) who suggested an idea(s) is also involved in the idea development phase.	0.74			

Note: SL = Standard loadings; α = Cronbach's Alpha; CR = Composite reliability; AVE = Average variance extracted. * Items have low factor loadings, and were deleted accordingly.

5.3. Evaluation of the Structural Model

This study draws the results of the structural model on Hair et al. [131]. First, to examine the structural model is to evaluate every set of predictors for possible collinearity. The results exhibit minimal collinearity with the variance inflation factor (VIF). Therefore, the collinearity among the predictor constructs is not an issue in the structural model, as all VIF values are below the threshold of five.

Second, the standardized beta values (β) of path coefficients were computed by using the PLS algorithm function in SmartPLS 3. Further, to test the research model hypothesis, and to measure the direction, strength, and significance level of the path coefficients, we used the PLS-SEM technique called bootstrapping to generate standard errors and t -values [129,131]. The estimated path relationships between the latent variables in the model are assessed through the sign, magnitude of path coefficients, and 95% bias-corrected and accelerated (BCa) bootstrap confidence intervals. Table 3 shows the results.

Table 3. Construct reliability, convergent validity, and discriminant validity through Fornell–Lacker and heterotrait–monotrait (HTMT) criterion.

	Mean	SD	1	2	3	4	5	6	7	8
<i>Managerial capability</i>										
1. Decision-making	3.09	0.66	0.74	0.48	0.56	0.36	0.78	0.58	0.57	0.66
2. Management style	3.12	0.79	0.35 **	0.72	0.73	0.27	0.46	0.56	0.52	0.43
3. People development	2.96	0.59	0.43 **	0.56 **	0.67	0.23	0.45	0.60	0.62	0.48
4. Succession planning	2.70	0.64	0.23 **	0.16 *	0.15 *	0.73	0.26	0.4	0.52	0.32
<i>Adaptive capability</i>										
5. Change management	3.08	0.66	0.58 **	0.34 **	0.36 **	0.16 *	0.77	0.46	0.60	0.64
6. Horizon scanning	3.01	0.66	0.41 **	0.40 **	0.46 **	0.25 **	0.34 **	0.73	0.71	0.57
7. Resilience	3.13	0.60	0.41 **	0.37 **	0.47 **	0.33 **	0.44 **	0.50 **	0.72	0.60
<i>Organizational innovation</i>										
8. Innovation	3.11	0.67	0.53 **	0.34 **	0.41 **	0.22 **	0.53 **	0.45 **	0.47 **	0.74

Note: * Correlation significance levels: $p < 0.05$ *; $p < 0.01$ **; SD = Standard deviation; italicized values on the diagonal are the square roots of the AVE (average variance extracted) and represent Fornell–Lacker’s criteria; values below the diagonal are the correlations between the constructs. Values above the diagonal are the HTMT values.

Third, in general, the values of R^2 for the endogenous constructs can be interpreted as substantial (R^2 0.75), moderate (R^2 0.50), and weak (R^2 0.25), [128]. Following these rules of thumb, Table 4 reports the values of R^2 of change management (0.42), horizon scanning (0.31), resilience (0.38), and innovation (0.50), which are considered as moderate values. These R^2 values were relatively high and acceptable.

Fourth, this study assesses the relative predictive relevance of the structural model by using the Stone–Geisser criterion (Q^2), which was derived through the blindfolding technique in PLS–SEM with an omission distance of eight [131]. All of the Q^2 values are considerably greater than zero, which provides support for the model’s predictive relevance concerning the reflective endogenous latent variables. The results are given in Table 4. Finally, as additional analysis, this study also reports a recently introduced overall goodness-of-fit measure—standardized root mean square residual (SRMR)—as an index for PLS–SEM model validation [123]. The difference between the observed correlation and the predicted correlation is defined as the absolute measure of model fit. A value of less than 0.08 is considered as a suitable level for this indicator. The composite model of SRMR analysis produces a value of 0.07, which confirms the overall model fit of the PLS–SEM model.

Table 4. Significant testing results of the structural model path coefficients.

Structural Path	Path Coefficient	Significant Difference ($p < 0.05$)?	95% BCa Confidence Interval	Conclusion
SRMR composite model = 0.07				
$R^2_{\text{Horizon scanning}} = 0.31$; $R^2_{\text{Resilience}} = 0.38$; $R^2_{\text{Change management}} = 0.42$; $R^2_{\text{Innovation}} = 0.50$;	$Q^2_{\text{Horizon scanning}} = 0.15$ $Q^2_{\text{Resilience}} = 0.18$ $Q^2_{\text{Change management}} = 0.22$ $Q^2_{\text{Innovation}} = 0.20$			
H1: Managerial capability → Adaptive capability				
Management style → Change management	0.10 ^{n.s}	No	(−0.04, 0.23)	H1a partially supported
Management style → Horizon scanning	0.14 *	Yes	(0.01, 0.27)	
Management style → Resilience	0.05 ^{n.s}	No	(−0.10, 0.18)	
Decision-making → Change management	0.47 ***	Yes	(0.34, 0.59)	H1b supported
Decision-making → Horizon scanning	0.22 ***	Yes	(0.10, 0.34)	
Decision-making → Resilience	0.14 *	Yes	(0.00, 0.26)	
People development → Change management	0.01 ^{n.s}	No	(−0.12, 0.15)	H1c partially supported
People development → Horizon scanning	0.28 ***	Yes	(0.11, 0.43)	
People development → Resilience	0.23 **	Yes	(0.08, 0.38)	
Succession planning → Change management	−0.03 ^{n.s}	No	(−0.15, 0.08)	H1d partially supported
Succession planning → Horizon scanning	0.12 *	Yes	(0.01, 0.22)	
Succession planning → Resilience	0.19 ***	Yes	(0.06, 0.30)	
H2: Adaptive capability → Organizational innovation				
Change management → Innovation	0.27 ***	Yes	(0.13, 0.40)	H2a supported
Horizon scanning → Innovation	0.14 **	Yes	(0.01, 0.26)	H2b supported
Resilience → Innovation	0.15 *	Yes	(−0.01, 0.31)	H2c supported
H3: Managerial capability → Organizational innovation				
Management style → Innovation	0.02 ^{n.s}	No	(−0.16, 0.20)	H3a not supported
Decision-making → Innovation	0.19 **	Yes	(0.05, 0.33)	H3b supported
People development → Innovation	0.08 ^{n.s}	No	(−0.08, 0.27)	H3c not supported
Succession planning → Innovation	0.03 ^{n.s}	No	(−0.11, 0.15)	H3d not supported

Note: ^{n.s} = Not significant (based on $t(4999)$, one-tailed test); BCa = bias-corrected and accelerated; Sig. = Significance; SRMR = Standardized root mean square residual; * $|t| \geq 1.65$ at p 0.05 level; ** $|t| \geq 2.33$ at p 0.01 level; *** $|t| \geq 3.09$ at p 0.001 level. R^2 = Determination coefficients; Q^2 = Predictive relevance of endogenous (omission distance = 8). Threshold for R^2 value: ≥ 0.25 (weak); ≥ 0.50 (moderate); ≥ 0.75 (substantial). Threshold for Q^2 value > 0 indicates predictive relevance.

5.4. Predictive Validity of PLS Path Model Using Holdout Samples

The coefficient of determination or R^2 value shows how well the proposed structural model explains the outcome of interest, while the Stone–Geisser criterion (Q^2) value shows the adequacy of the predictive validity of the structural model. Yet, the model is not indicative of how independent variables predict dependent variables (outcome of interest). A fit is not always a good way of assessing predictive validity [132]. Therefore, recently Shmueli, Ray, Estrada, & Chatla [133] opened a discussion about the different dimensions of prediction and their effect on predictive performance assessment with PLS path models. To address this limitation, this study follows the recommendations in Woodside [134] to perform predictive validity assessment. To perform cross-validation tests with holdout samples, this study follows Cepeda–Carrión et al. [135] by dividing the sample number ($n = 210$) randomly into a training sample (two-thirds of the sample, $n = 140$) and a holdout sample (the remaining sample, $n = 70$). Then, the training sample is used to estimate the parameters in the PLS path model (weights and path coefficients). Then, using the holdout sample, each observation is standardized, and the

construct scores are formed as linear combinations of the respective observation by using the weights, which are obtained from the training sample. The construct scores are then standardized. For all of the endogenous constructs (in the PLS path model) in the case of the holdout sample, the predictive scores are created by using the path coefficients obtained from the training sample. For the four endogenous constructs, the correlations between their predictive scores and construct scores (change management, $r = 0.68$, $p < 0.01$; horizon scanning, $r = 0.49$, $p < 0.01$; resilience, $r = 0.55$, $p < 0.01$; and innovation, $r = 0.79$, $p < 0.01$) suggest that the PLS path model in this study has acceptable predictive validity.

5.5. Importance-Performance Matrix Analysis (IPMA)

This study employs an importance-performance matrix analysis (IPMA) [136,137] to further elaborate the PLS-SEM results by considering the performance of each individual construct. For a particular target construct, the IPMA exhibits the structural model's total effects (importance) on the x-axis, and the average values of each latent variable scores (performance) on the y-axis, in order to highlight the significant areas that need special attention for improvement. From a management point of view, the results help to identify the keys strengths and weakness, and also distinguish between determinants of high importance and relatively low performance. Performing an IPMA requires determining a target key construct, which is organizational innovation in this study.

The IPMA results in Table 5 and Figure 2 show that a one unit increase in the performance of decision-making is expected to increase the performance of organizational innovation by the value of the total effect (0.39). Furthermore, change management (0.28), people development (0.21), horizon scanning (0.15), and resilience (0.14) have the most importance in regard to organizational innovation as well.

Table 5. Importance-performance matrix analysis (IPMA) results at the construct level.

Criterion: Organizational Innovation	Total Effect	Performance
Decision-making	0.394	52.538
Management style	0.068	53.567
People development	0.212	50.117
Succession planning	0.084	47.203
Change management	0.276	52.935
Horizon scanning	0.146	49.872
Resilience	0.142	52.710

Note: All of the values of total effects larger than 0.10 are significant at the $\alpha \leq 0.10$ level, according to Schloderer et al. [136].

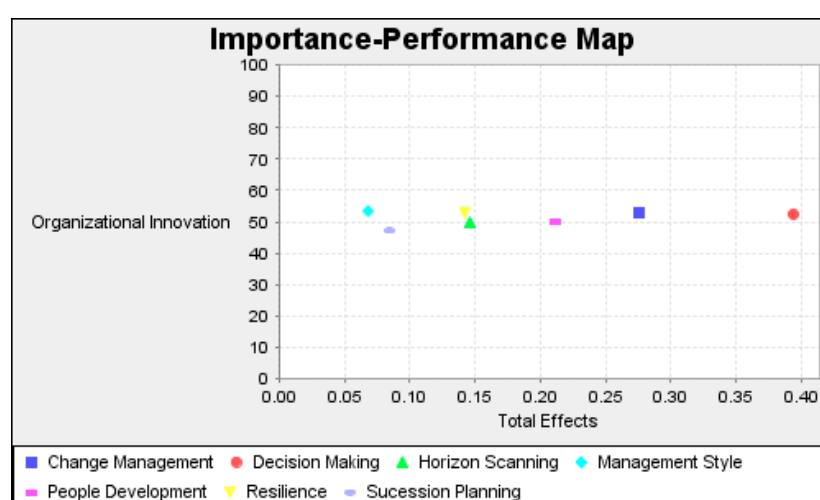


Figure 2. Graphical representation of IPMA results at the construct level.

6. Discussion and Implications

The study aimed to explore the relationship between managerial capability and adaptive capability, and their collective impact on organizational innovation in SMEs. The results from PLS–SEM reveal that management style is positively linked to horizon scanning, but its links with change management and resilience are not significant, which partially supports H1a. Decision-making is positively linked with change management, horizon scanning, and resilience, which supports H1b. People development is positively linked with horizon scanning and resilience, but not to change management, which partially supports H1c. Succession planning is positively linked with horizon scanning and resilience, but not to change management, which partially supports H1d. Similarly, change management, horizon scanning, and resilience are positively linked with organizational innovation, which supports H2a, H2b, and H2c, respectively. Finally, decision-making is positively linked with organizational innovation, which supports H3b. Meanwhile, management style, people development, and succession planning links are not significant for organizational innovation; therefore, H3a, H3c, and H3d are not supported. The results of insignificant effect do not imply that some of the insignificant independent variables are unimportant. Instead, this suggests a less pronounced importance as compared with the other significant independent variables. Bivariate correlations among all independent and dependent variables are significant and positive (Table 3), supporting this argument. This will be further explored in future works.

The study was carried out in a developing country's SMEs, which were expected to show some peculiar behavior and finding as compared with studies carried out in developed countries. Overall, the managerial capability has a positive and strong relationship with adaptive capability, which further have similar relationships with organizational innovation. However, in the case of a direct relationship between managerial capability and organizational innovation, the results are quite different from most of the literature.

First, we focused on managerial capability and adaptive capability, as the literature highlighted that firms can adapt better to business changes and create and sustain competitive advantage by developing their employees and making collaborative decisions in accordance with external and internal information [138]; managers that employ such tactics have better and more effective management capabilities. Prior studies showed that managerial capability directly stimulates organizational innovation; however, this was not supported in our study, as managerial capabilities need to be engulfed within adaptive capabilities prior in order to stimulate organizational innovation. Managerial style also showed a positive relationship with adaptive capability, which is justified by the literature [32,139], where managers sense the opportunities and threats and then reconfigure the firm's sources and capabilities in order to sustain the competitive advantage. Also, management style and people development play a vital role in organizational innovation if managers and employees are provided with such training and knowledge, which will sustain the competitive advantage by carefully scanning the competitors and anticipating future trends. Another major responsibility of management is to make decisions that are totally different in SMEs as compared with large companies. Decision-making in SMEs will not be effective and result-oriented if managers do not have the appropriate information, or if all the stakeholders are not involved in the decision-making process. The results also show that succession planning is positively related to adaptive capability, as the future leaders should be selected and developed after anticipating the future market and environment [140].

Secondly, the study empirically showed the positive and direct effect of adaptive capability on organizational innovation, which is an original and novel contribution in the context of SMEs, although it had also been confirmed by Paliokaite [24,49] in Swedish SMEs. The findings also indicate the strong and positive relationship between all of the variables of adaptive capability with organizational innovation. Horizon scanning enables the management team to have updated information about new products, services, and technology, which enables them to understand the changing market trends and customer demands. The SMEs can then prepare themselves to survive during low market periods and critical financial situations.

The important role of organizational innovation is further verified by importance-performance matrix analysis (IPMA). The results of IPMA (Table 5 and Figure 2) highlight that the areas of priority for management and their overall effects, such as decision-making, change management, people development, horizon scanning, and resilience, are highly relevant for increasing organizational innovation due to their major impact. This study also endorses that senior management should emphasize and utilize their administrative functions in order to take initiatives regarding managerial and adaptive capabilities and achieve a sustainable competitive advantage in regard to innovation. This result provides valuable and practical information for managers on the relative impact of managerial and adaptive capability on organizational innovation.

This study no doubt has some implications for the SME managers who wish to stimulate organizational innovation and transformation processes in their organizations. First, the study is grounded on data from SMEs in Pakistan, a developing country. Therefore, the findings may not be taken in, as the study is transversal, and outcomes should be examined with prudence. Second, the specimen used in this study is manufacturing sector-intensive, which includes different types of heterogeneously distributed industries. The findings may subsequently exhibit the inclinations of the subgroup of firms most demonstrative in our specimen. Third, the data collected is mostly based on the perceptions of firm managers, and could thus be somewhat subjective.

7. Concluding Remarks

The empirical findings showed that organizational innovation is directly stimulated by the adaptive capability of SMEs, and that managerial capability has an indirect relationship with organizational innovation via adaptive capability. The SMEs need to be adaptive and agile in order to survive and thrive in dynamic markets.

Future research could include the service industry, and a comparison could be conducted using the proposed model. Also, the purposed model could be validated by collecting data from developed countries such as Taiwan, China, South Korea, and Hong Kong. Other factors such as operational capability in terms of process and performance management may be included in future research. Future works could also further explore the insignificant paths of the study. In particular, the insignificant relationship between managerial capability and innovation could be explored to further highlight the mediating role of adaptive capability.

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