



INFORMATION TECHNOLOGY CAPABILITIES AND SMEs PERFORMANCE: AN UNDERSTANDING OF A MULTI- MEDIATION MODEL FOR THE MANUFACTURING SECTOR

Rana Nabeel-Rehman* University of Engineering and Nabeel_um@hotmail.com
Technology, Lahore, Pakistan

Mohammad Nazri University of Malaya, Kuala Lumpur, Nazrri@um.edu.my
Malaysia

* Corresponding author

ABSTRACT

Aim/Purpose Despite the fact that the plethora of studies demonstrate the positive impact of information technology (IT) capabilities on SMEs performance, the understanding of underlying mechanisms through which IT capabilities affect the firm performance is not yet clear. This study fills these gaps by explaining the roles of absorptive capacity and corporate entrepreneurship. The study also elaborates the effect of IT capability dimensions (IT integration and IT alignment) upon the SMEs performance outcomes through the mediating sequential process of absorptive capacity and corporate entrepreneurship.

Methodology This study empirically tests a theoretical model based on the Dynamic Capability View (DCV), by using the partial least square (PLS) technique with a sample of 489 manufacturing SMEs in Pakistan. A survey is employed for the data collection by following the cluster sampling approach.

Contribution This research contributes to the literature of IT by bifurcating the IT capability into two dimensions, IT integration and IT alignment, which allows us to distinguish between different sources of IT capabilities. Additionally, our findings shed the light on the dynamic capability view by theoretically and empirically demonstrating how absorptive capacity and corporate entrepreneurship sequentially affect the firms' performance outcomes. At last, this study contributes to the literature of SMEs by measuring the two levels of performance: innovation performance and firm performance.

Accepting Editor Salah Kabanda | Received: February 18 2019 | Revised: May 21, August 3, August 20, August 25, September 2, 2019 | Accepted: September 3, 2019.

Cite as: Nabeel-Rehman, R, & Nazri, M. (2019). Information technology capabilities and SMEs performance: An understanding of a multi-mediation model for the manufacturing sector. *Interdisciplinary Journal of Information, Knowledge, and Management*, 14, 253-276. <https://doi.org/10.28945/4429>

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- Findings** The results of the analysis show that the absorptive capacity and the corporate entrepreneurship significantly mediate the relationship between both dimensions of IT capability and performance outcomes.
- Keywords** information technology capabilities, IT integration, IT alignment, absorptive capacity, corporate entrepreneurship, innovation performance, firm performance

INTRODUCTION

Around the globe, the economic system of developed as well as developing nations proportionally comprises of small and medium enterprises (SMEs). These countries are achieving economic growth targets by bringing SMEs into the mainstream in most of their economic activity concerns (Tambunan, 2008). In the current era of advanced technology, the role of information technology (IT) for the SMEs sector is considered as a source of oxygen because it greatly helps in survival of such firms, is essential to enhance performance and is vital for gaining the competitive advantage (Neirotti & Raguseo, 2017; Raymond, Bergeron, Croteau, & St-Pierre, 2016). Although studies on the use of IT in SMEs are numerous, most scholars target SMEs in the developed economies; or large and multi-national firms. As a consequence, there are few studies in developing countries that examine the phenomenon of IT and SMEs from the perspective of IT capabilities.

The literature of IT capabilities demonstrates that IT capabilities have a positive effect on innovation performance (Lyver & Lu, 2018) and firm performance (Uma & Roger, 2013). The IT capabilities of any firm are defined as the ability of the firm to deploy and mobilize the IT-based resources along with the combination of the firm's other resources and capabilities with an aim to enhance the various key performance indicators of the firm (Bharadwaj, 2000). Despite the breadth of research on the direct relationship of IT capabilities with innovation performance and firm performance, the mechanisms through which IT capabilities influence innovation performance and firm performance are not well understood. Understanding this mechanism would potentially provide a means of predicting the circumstances under which IT capability indirectly affects SMEs performance (Melville, Kraemer, & Gurbaxani, 2004). This would be valuable for SMEs in developing countries that face a series of contextual challenges that negatively influence their performance. Previous studies have used the Dynamic Capability View (DCV) Framework as a means of explaining the procedures and processes that a firm uses to redeploy and reconfigure its other capabilities to utilize various business opportunities in order to achieve competitive advantage in this rapidly changing business environment (Teece, Pisano, & Shuen, 1997). A dynamic capability framework helps firms to assess the external knowledge which then allows them to engage in entrepreneurial activities; and in return, improve the innovation performance and the firm performance of SMEs. Yet, most studies focus on a single dimension of IT capability (Kim, Shin, Kim, & Lee, 2011) or some aggregate level (Chen & Tsou, 2012; Chen, Wang, Nevo, Benitez-Amado, & Kou, 2015) which does not give a comprehensive view of how IT capabilities influence performance. Therefore, the multi-dimensional role of IT capabilities is rather unclear in theory and practice. With this background, this study seeks to examine how IT capabilities affect the performance outcomes of SMEs, in a dynamic business environment, indirectly. The Dynamic Capability View (DCV) Framework will be used as the sensitizing framework for the study.

The remainder of this paper has been organized as follows; section two briefly explains the theoretical support and literature of IT capabilities, absorptive capacity, and corporate entrepreneurship in order to give the conceptual foundation and theoretical boundaries at the level of the firm. Section three explains the theoretical relationship between the variables and their sequential role. The methodology of this study is described in section four of this paper and section five presents the empirical findings of the current study. In the end, section six explains the theoretical contribution, managerial contribution, and limitations of this study.

LITERATURE REVIEW

IT CAPABILITIES

Earlier studies have analyzed the concept of IT capabilities from different perspectives including strategic management (Brynjolfsson & Hitt, 2000), organization theory (Karimi, Somers, & Gupta, 2001), and economics (Chesbrough & Schwartz, 2007). This study analyzes the concept of IT capabilities with two dimensions: IT integration and IT alignment. These both dimensions of IT capabilities deals with the internal and external activities of firms, as IT integration helps to integrate IT within departments and also other business for IT support (Zhu & Kraemer, 2005). Similarly, those firms perform well when key internal IT resources – physical IT infrastructure components, technical IT skills, and knowledge assets are aligned with business strategy (Pérez-López & Alegre, 2012).

IT integration is defined as to what extent, the firms link IT along with their business partners; either by supporting the partners to communicate and exchange information by establishing collaborative relationships (Chen et al., 2015; Shook, Ketchen Jr, Hult, & Kacmar, 2004). With the help of integration capability of IT, a firm develops its ability to respond to the market opportunities and to business process integration (Shook et al., 2004). An integrated application helps the firm in gathering and analyzing required information, increasing the process efficiency and assessing the market risks and needs.

The IT business alignment refers to the extent to which IT and business operations share congruent goals and maintain a harmonious relationship (Luftman & Brier, 1999). The IT alignment focuses on maintaining an IT strategy that is consistent with the business strategy of a firm and in turn, that supports in the realization and formulation of the innovation goals of the firm (Luftman & Brier, 1999). Firms can increase profitability and gain a competitive advantage by refining the alignment between IT strategies and business strategies (Aydiner, Tatoglu, Bayraktar, & Zaim, 2019). Whereas, the firms face an adverse position in terms of financial outcomes and wasted resources if they fail to align their IT and business strategies (Ravishankar, Pan, & Leidner, 2011). Table 1 presents the key literature related to IT capabilities and performance outcomes with the intervening role of dynamic capabilities.

Table 1: Summary of Key Literature

Author(s)	Independent Variable	Mediating Variable	Dependent Variable	Findings
Francalanci and Morabito (2008)	IT Integration	Absorptive capacity	Firm performance	Results indicate that organizational absorptive capacity has a mediation effect between IT integration and firm performance.
Crossan and Apaydin (2010)	Technology variable	Corporate entrepreneurship	Organizational performance	Technological variable (antecedents of corporate entrepreneurship) and that corporate entrepreneurship influence organizational performance.
Uma and Roger (2013)	IT capabilities	Absorptive capacity	Firm performance	Results show that IT capabilities directly influence the absorptive capacity and in return, absorptive capacity affects the performance of firm.
García-Morales, Bolívar-Ramos, and Martín-Rojas (2014)	Technology variable	Absorptive capacity Corporate entrepreneurship	Organizational performance	Technology variable increases corporate entrepreneurship with the help of firm's absorptive capacity.
Chen et al. (2015)	IT capabilities	Corporate entrepreneurship	Innovation performance	IT capabilities have a positive impact on innovation performance through corporate entrepreneurship.

Author(s)	Independent Variable	Mediating Variable	Dependent Variable	Findings
Tzokas, Kim, Akbar, and Al-Dajani (2015)	Technology capabilities	Absorptive capacity	Firm performance	Firm's absorptive capacity leads to better performance in terms of new product development, market performance and profitability when used in combination with the firm's capability to engage state of the art technologies in its new product development program.
García-Sánchez, García-Morales, and Martín-Rojas (2018b)	Technology skills	Absorptive capacity Corporate entrepreneurship	Organizational performance	Absorptive capacity significantly influences organizational performance through corporate entrepreneurship.
Rehman, Nor, Taha, and Mahmood (2018)	IT capabilities	Corporate entrepreneurship	Firm performance	Dimensions of corporate entrepreneurship significantly mediate the relationship between IT capabilities and firm performance.
D'Este, Mahdi, Neely, and Rentocchini (2012)	Information technology	knowledge ambidexterity	Innovation performance	The empirical analysis suggests that IT infrastructure enables the firm to explore new knowledge and exploit existing/new knowledge to innovate more and better.
Graham, Hofer, Donaldson, MacKinnon, and Schafer (1997)	Information technology	Knowledgebase	Innovation	The results present that information technology influence firm performance.

IT CAPABILITIES AND ABSORPTIVE CAPACITY

With an aim to sustain competitive advantage, firms are investing heavily in their IT capabilities as they greatly facilitate the firms in improving the knowledge and information flow across the departments and also inter-organization. Therefore, IT capabilities influence the absorptive capacity of a firm. According to Cohen and Levinthal (1990), absorptive capacity can be defined as the firm's ability to acquire, assimilate, transform and exploit knowledge-based resources. Absorptive capacity is a capability of a firm that helps in the firm's long-term existence and makes remarkable accomplishments because it can create a strong and well-balanced environment for the firm's knowledge base (Zahra & George, 2002). It increases the firm's ability to predict the market trends accurately and to take advantage of emerging opportunities (Cohen & Levinthal, 1994).

IT INTEGRATION AND ABSORPTIVE CAPACITY

IT integration helps a firm develop an effective information and communication exchange environment within and outside the boundaries of the firm, thereby improving absorptive capacity. For example, in order to deliver the relevant, desired and fast design to its clients and partners, the firm connects with its corporate partners with the help of computer-supported design and new knowledge linkages. In addition, integrated applications and systems facilitate the firms in information sharing through different channels, which in turn helps them to manage the activities and related processes to craft an effective response to counter competitors' moves (Grover & Saeed, 2007). The IT integration of a firm tends to increase its functional coordination by disseminating the operational information from suppliers to the firm's various business divisions in an efficient manner (Francalanci & Morabito, 2008; Kotabe, Jiang, & Murray, 2011).

Integrated IT capability enhances absorptive capacity by helping a firm in acquiring and assimilating knowledge from within and from outside the firm's boundaries (Fabrizio, 2009). Firstly, integrated IT capability supports a firm in acquiring knowledge to enhance IT coordination. This integration is critical for synchronization and connecting communication networks across the firm. With more IT technical coordination, the knowledge acquisition becomes easy, effective and reliable. The infor-

mation coordination helps the managers in increasing their ability to assimilate knowledge and to identify the shifts in the dynamic business environment. Based on these arguments, we propose that:

H1: IT integration has a positive effect on absorptive capacity

IT ALIGNMENT AND ABSORPTIVE CAPACITY

Alignment of fundamental IT business systems is an enabling agent of knowledge activities as it increases the capacity of the knowledge channels to evolve (Roberts, 2015). The firm's absorptive capacity is helpful, as it is related to its capability of assimilating new knowledge and entails a fast pace of learning speed, which increases the adaptability of the firm in the context of external environment (Cohen & Levinthal, 1990). The IT business alignment helps to diffuse the voice of customers into the voice of an engineer by enhancing the collaborative spirit along with sound communication amongst all working units of a firm. Hence, it supports and promotes the research and development in coordination with all the working units to better design and develop new products and services for customer's convenience. Therefore, we hypothesize that:

H2: IT Alignment has a positive effect on absorptive capacity

IT CAPABILITIES AND CORPORATE ENTREPRENEURSHIP

Corporate entrepreneurship is defined as "a vision-directed, organization-wide reliance on entrepreneurial behavior that purposefully and continuously rejuvenates the organization and shapes the scope of its operations through the recognition and exploitation of entrepreneurial opportunity" (Ireland, Covin, & Kuratko, 2009). By recognizing its inevitable significance to a firm's survival, performance and growth; corporate entrepreneurship has appealed by many strategy scholars (Simsek, Lubatkin, Veiga, & Dino, 2009) as a process through which the firms seek to innovate, create new businesses and transform domain of the business or its fundamental strategic processes and methods in order to have an impact on firm's various performance-related outcomes (Simsek et al., 2009). Corporate entrepreneurship comprises of firm-related formal as well as informal activities that focus on discovering and pursuing new business opportunities through innovation, strategic renewal and business venturing (Chua, Chrisman, & Sharma, 1999; Guth & Ginsberg, 1990). It is established that corporate entrepreneurship effectively contributes to enhancing the performance of small- and medium-sized enterprises (Heavey & Simsek, 2013).

IT INTEGRATION AND CORPORATE ENTREPRENEURSHIP

IT capabilities play a vital role in bridging the gaps between consumers and competitors by establishing sound communication within and outside the firms for seeking maximum involvement from the participants, sponsors, and related stakeholders. This would further reinforce communication and networking for the compliance of successful entrepreneurial ventures. Facilitated by the excellence of the communication, the collaborative efforts of the firm's agents with respect to growing customer preferences and their willingness to purchase products, allow the firms to incorporate innovative design and engineering of the products (Pavlou & El Sawy, 2010). In this way, the acceleration of new products and their target market compatibility will help to promote corporate entrepreneurship activities (Cordon, Seifert, & Everatt, 2003). Therefore, we propose that:

H3: IT integration has a positive effect on corporate entrepreneurship

IT ALIGNMENT AND CORPORATE ENTREPRENEURSHIP

The IT business alignment enhances the collaboration and communication amongst all working units of a firm, hence promotes the research and development (R&D) to formulate better understanding about designing and developing the new products and services for customer's convenience. The promptness efficiency of changing mechanisms and transformations in products and processes are significant contributors to IT capabilities of a firm's corporate entrepreneurship. IT Alignment al-

allows a firm to enhance the prompt availability of new products, new applications, ease in accessing data and development of networking in a firm (DeLone & McLean, 1992). The “frequent flyer program” is one example, for instance, a USA airlines reservation system aims to make arrangements for hotel booking and car hire, which enhanced the flexibility as well as integration in the market for the current business customers (Karimi et al., 2001). The enhancement of IT alignment supports the implementation of new systems in line with ongoing business trends (Bhatt, Emdad, Roberts, & Grover, 2010). Accordingly, we propose that:

H4: IT Alignment has a positive effect on corporate entrepreneurship

ABSORPTIVE CAPACITY AND CORPORATE ENTREPRENEURSHIP

One of the very noteworthy aspects of corporate entrepreneurship is its Knowledge activities (Agarwal, Audretsch, & Sarkar, 2010; Francalanci & Morabito, 2008) which are considered vital in the exploration of alternative ways to get things done as and when are required in the modern era. The knowledge aspect in corporate entrepreneurship requires the integration of external resources with value creation processes if a firm intends to minimize the risks associated with emerging business opportunities and the same is accomplished by promoting the development of new products, technologies, and systems (Gregor, 2006). In this way, by investing in the capacity building and facilitation for maximum utilization of external new knowledge, the firms become capable of reaping optimum benefit from such new external knowledge (Laursen & Salter, 2006). This highlights the importance of absorptive capacity of a firm in meeting upcoming challenges for corporate entrepreneurship. In addition, the absorptive capacity allows the influx of rich processes, bridges knowledge gaps and ensures the outbursts of new knowledge to enhance corporate entrepreneurship (Lane, Koka, & Pathak, 2006). Such external knowledge acquisition and assimilation support the firm in its innovation activities (García-Sánchez et al., 2018b). Similarly, external knowledge transformation and exploitation helps to engage in self-renewal and business venturing activities of a firm (Baruch & Holtom, 2008). We thus propose that:

H5: Absorptive capacity has a positive effect on the corporate entrepreneurship

ABSORPTIVE CAPACITY AND INNOVATION PERFORMANCE

Absorptive capacity of a firm is very important for innovative activities and it supports to enhance its innovation performance (Bell, Bryman, & Harley, 2018). In a dynamic business environment, knowledge acquisition capacity, a dimension of absorptive capacity, makes it possible for a firm to quickly recognize its external environment (Lei, Hitt, & Bettis, 1996) and assists the firms to increase the breadth and depth of available knowledge (Yli-Renko, Autio, & Sapienza, 2001). In addition, the knowledge acquired from outside of the organization can enhance the capacity of the firm and makes it capable of creating the novel links (Mishra, Gunasekaran, Papadopoulos, & Childe, 2018). Several earlier scholars have associated knowledge acquisition with innovation performance (Chen & Huang, 2009; Zhou & Li, 2012). The other dimension of absorptive capacity, assimilation of external knowledge helps a firm to increase its problem-solving rate and reduce the time period of the new product development cycle. Furthermore, external knowledge assimilation can evade monotonous work as it keeps the firm's knowledge reserves up-to-date (Atuahene-Gima, 2003) and improves a firm's competitiveness and innovativeness (Hoarau & Kline, 2014). Therefore, high level of a firm's knowledge assimilation capacity helps the firm in shape of innovation performance (Inkpen, 2000). While on the other hand, the firms who do not possess enough ability of knowledge assimilation, tend to waste its important intellectual resources (Huber, 2001).

Knowledge transformation speeds up the new knowledge absorption and realizes efficient innovation and integration, leading the firm to considerably higher business performance (Yli-Renko et al., 2001). The transformation of knowledge becomes more important for the firm, when the firm finds differences between new knowledge and current knowledge, as the firm cannot comprehend external knowledge instantly. With the help of knowledge transformation, the firms can rebuild their cogni-

tive structure from a new angle (Todorova & Durisin, 2007), thus improving their performance of innovation. Furthermore, high level of knowledge exploitation capacity of a firm can constantly translate new and current knowledge into services and products innovation (Alavi & Tiwana, 2002). Additionally, a firm's knowledge exploitation can support to promote its outcomes of innovation through developing individual creativity performance (Cheung, Chau, & Au, 2008). Hence, the firms should expand the outside knowledge application to attain a higher level of innovation performance (Majchrzak, Cooper, & Neece, 2004). Therefore, we propose that:

H6: Absorptive capacity has a positive effect on innovation performance

ABSORPTIVE CAPACITY AND FIRM PERFORMANCE

The firms gain a competitive advantage by developing internal knowledge effectively and using external knowledge efficiently (De Zubielqui, Jones, & Lester, 2016; Fabrizio, 2009). According to Jiménez-Jiménez and Sanz-Valle (2011), firms should increase their efforts to acquire new knowledge by developing activities that would enhance sharing, distribution, and interpretation of knowledge, as these knowledge activates directly affect the firm performance. According to Harvey, Skelcher, Spencer, Jas, and Walshe (2010), the absorptive capacity is directly influenced by the internal and external conditions of business and in return, it enhances the performance of firm. Likewise, Lichtenthaler (2016) established an inverted U-shaped association between absorptive capacity and financial performance of the firm.

Bolívar-Ramos, García-Morales, and Martín-Rojas (2013) and García-Sánchez, García-Morales, and Martín-Rojas (2018a) analyze the two-dimensional role of absorptive capacity and find out that the potential absorptive capacity of a firm is directly linked with the realized absorptive capacity and the realized absorptive capacity significantly influence the firm performance. The knowledge transformation and exploitation of such knowledge provide avenues into the creation of new goods, systems, processes and knowledge (Spender, 1996; Zahra & George, 2002). As a result, firms will find themselves in a better position to promote business activities and achieve better firm performance. According to Kotabe et al. (2011), the firms, that lack knowledge transformation, and exploitation, do not have the capacity to internalize knowledge into their existing applications, procedures, and routine work to improve its market performance. According to Mishra et al. (2018), absorptive capacity provides financial benefits to a firm by transforming and translating the knowledge into products and services. Therefore, we propose that:

H7: Absorptive capacity has a positive effect on firm performance

CORPORATE ENTREPRENEURSHIP AND INNOVATION PERFORMANCE

Corporate entrepreneurship helps to explain the variations in performance indicators of the firm (Zahra & Covin, 1995). For instance, corporate entrepreneurship activities support the managerial expertise and financial resources to develop a new product or services (Zahra & Covin, 1995). A firm's entrepreneurial venture is considered as a proactive attitude in observing the business environment, leverage the competitions and provide better market insights to help in making better decisions regarding new product innovation (Dess & Lumpkin, 2005).

In addition, by focusing the innovation performance, a firm with high of level corporate entrepreneurship tries to find novel ideas, improve the operational processes and engage in the thinking of innovation that direct the firm in creation of new technologies and insights (Chen et al., 2015; Laursen & Salter, 2006), which are essential for gaining high level of returns from the efforts of innovation. Additionally, a high level of self-renewal abilities of firms frequently embraces and strives the combination of a new resource, which helps in the advancement of processes of innovation and enhancement of innovation performance. It is important to note that corporate entrepreneurship and innovation performance is conceptually and empirically different concepts despite their apparent similarity in terms of being the dimensions of innovation (Crossan & Apaydin, 2010; Lyver & Lu,

2018; Nambisan, 2013). According to Wang and Ahmed (2004), innovation performance refers to introducing the new products into the market or opening up new markets by combining strategic orientation with innovative behavior and process. Accordingly, we propose that:

H8: Corporate entrepreneurship has a positive effect on innovation performance

CORPORATE ENTREPRENEURSHIP AND FIRM PERFORMANCE

Corporate entrepreneurship is an antecedent of firm performance and is an important strategic variable for a firm's process of survival in a competitive business environment (Stoffels & Leker, 2018). In the current world and in an environment of animosity, financial crisis and less opportunities for business, it is necessary for the firms to enhance their entrepreneurial corporate activities (Del Giudice & Straub, 2011; Simsek & Heavey, 2011) to achieve a first-mover advantage, which affects the firm performance positively (Pearce, Fritz, & Davis, 2010). The firms can achieve the targets of growth and profitability by recognizing the weakness and threats they face and figure out solutions through corporate entrepreneurship activities (Antoncic & Hisrich, 2001; Bianchi, Glavas, & Mathews, 2017).

Corporate entrepreneurship provides support in preparing various departments for upcoming business enhancement and therefore, making it possible for organizations to attain success in business ventures (Bierwerth, Schwens, Isidor, & Kabst, 2015; Lin & Lee, 2011). The inclination of businesses towards venturing activities helps in improving overall performance in order to have a better competing position in the industry (Benner & Tushman, 2003). The entrepreneurial innovation encourages firms to take a competitive edge over their rivals (Antoncic & Hisrich, 2001; Rehman et al., 2018). Moreover, innovation-related activities enable the firms to comprehend preliminary performance outcomes as an essential component to strengthen its financial performance. In recent times, business is giving consideration to explore new opportunities and to become aware of global trends, therefore, the business inclination towards adopting a strategic renewal process has increased (Phan, Wright, Ucbasaran, & Tan, 2009). In the strategic renewal process, organizations redefine themselves in terms of routine tasks, operational activities, and performing actions according to the base approach they follow. Accordingly, we propose that:

H9: Corporate entrepreneurship has a positive effect on firm performance

INNOVATION PERFORMANCE AND FIRM PERFORMANCE

In modern economy and an era of advanced knowledge, innovation is considered as the main source of competitive advantage (Daghfous, 2004; Prajogo & Ahmed, 2006). Innovation helps to create "isolation mechanisms" which shield the firm's profit margins and bring financial benefits (Lavie, 2006). It is represented in existing literature that innovation outputs have a significant positive effect on the firm performance and it also suggests that innovating firms are highly profitable as compared to non-innovators (Leiponen, 2000; Zehir, Can, & Karaboga, 2015). According to Roberts (1999), with the consistency of innovation-related achievements, the firms show persistent and considerably high level of profits in their balance sheets. Gopalakrishnan (2000) observed that innovation speed and magnitude positively influenced firm's financial performance. Innovation has also presented a positive effect on sales growth of service firms (Mansury & Love, 2008). Furthermore, in a study of Canadian manufacturing firms, Thornhill (2006) has highlighted that for high-technology firms where the knowledge assets were more, the effect of new innovations on revenue growth was greater. Innovation enables the firms to deploy and create their capabilities that help in long-term business performance (Teece, 2007). Based on successful innovation, the other competing firms cannot easily imitate, which allows the innovation-focused firm to sustain their advantages (García-Morales, Ruiz-Moreno, & Llorens-Montes, 2007). Therefore, we propose that:

H10: Innovation performance has a significant positive effect on firm performance

Based on the above research hypotheses, Figure 1 presents the research model.

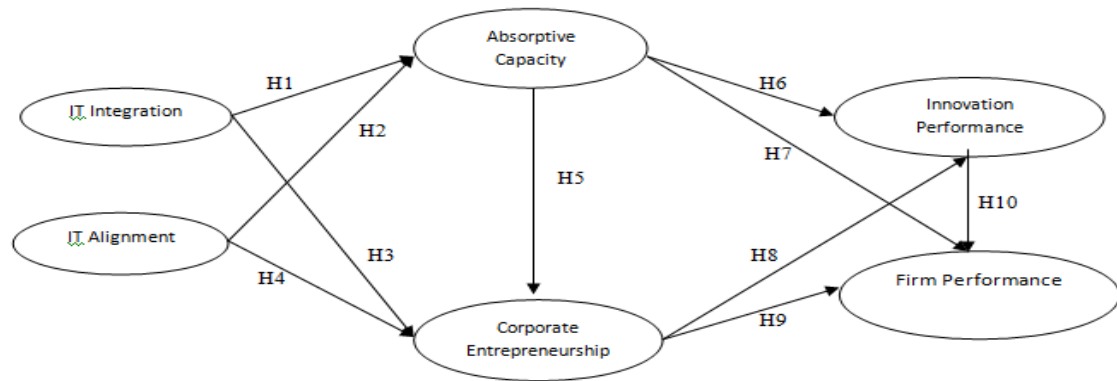


Figure 1: Research Model

METHODOLOGY

SAMPLE AND PROCEDURE

The SMEs in the Pakistani manufacturing sector constitute the research population for this study. According to small and medium enterprises development authority (SMEDA), the firms with more than 50 employees but less than or equal to 250 employees are considered to be medium-sized manufacturing firms. A list of top management/CEOs was developed based on the registered medium-sized firms in SMEDA. In our study, CEOs were the main informants, as they deal with all the information from departments. Furthermore, they are an important source of information for the evaluation of all the variables of this study (Bolivar-Ramos, García-Morales, & García-Sanchez 2012).

The most appropriate sampling technique used in the context of our study is cluster sampling. According to SMEDA, there are clusters of industries in major cities of Pakistan (Punjab). This study has selected seven major cities (Lahore, Faisalabad, Multan, Gujranwala, Sialkot and Gujrat, Sheikhpura) of Punjab province. These cities are said to have sixty-five percent of all industries in Punjab. Furthermore, we selected industries with the maximum contribution in GDP, exports, and employment.

RESEARCH INSTRUMENT

The research instrument was developed based on prior studies work. IT integration was measured using the four items developed and refined by Rai and Tang (2010) on the 7 points Likert scale. IT business alignment constructs were adopted from the works of Kearns and Lederer (2003). Absorptive capacity was measured by using the scale developed by Jiménez-Barrionuevo, García-Morales, and Molina (2011). Specific measurements include knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation. Researchers obtained a four-item scale of absorptive capacity by taking the arithmetic mean of all items of absorptive capacity. Corporate entrepreneurship was measured by using the scale developed by Collinson (2003) and De Vaus (2001). These measurements include business venturing, self-renewal, innovation, and proactiveness. Researchers obtained a four-item scale of CE by taking the arithmetic mean of all items of corporate entrepreneurship.

By following the work of Sekaran and Bougie (2016) this study measures the innovation performance by five items. Sekaran and Bougie (2016) conceptualized the innovation performance by five dimensions: (I) product; (II) process; (III) strategy; (IV) behavior and (V) market innovation. A five-item short scale was developed by Parida and Örtqvist (2015), by following the conceptualizations of

Sekaran and Bougie (2016). Scholars have used the objective and subjective perception of firms' managers to measure the firm's related outcomes (Venkatraman & Ramanujam, 1987). The firm performance is measured by the five-item scale established by (Murray & Kotabe, 1999).

All the constructs were measured by employing a seven-point Likert scale, having the range from 1= strongly disagree to 7= strongly agree. Previous researchers have analyzed these constructs in the context of SMEs in developing economies (Iyengar, Sweeney, & Montealegre, 2015; Lyver & Lu, 2018). For this study, in order to ascertain the validity further, the constructs have also been validated by the academic and industry experts in Pakistan. Table 2 presents the measures of constructs.

Table 2: Measures

	IT Integration
1	Our firm transfers data with our partners.
2	Our firm provides a seamless connection between our partner systems and our systems.
3	Our firm easily aggregates relevant information from our partner databases.
4	Our firm easily accesses data from our partners.
	IT Alignment
1	Our firm's IT plans to reflect the business plan goals
2	Our firm's IT plans to support business strategies
3	Our firm's IT plans recognize external business environment forces
4	Our firm's plans refer to IT Plans
5	Our firm's plans refer to specific information technologies
	Absorptive Capacity
	Knowledge Acquisition
1	Close personal interaction exists between the two organizations.
2	The relationship between the two organizations is characterized by mutual trust.
3	The relationship between the two organizations is characterized by a high level of reciprocity.
	Knowledge Assimilation
1	The organizational cultures of the two organizations are compatible.
2	The operating and management styles of the two organizations are compatible.
	Knowledge Transformation
1	Interdepartmental meetings are organized to discuss the development and tendencies of the organization.
2	The important data are transmitted regularly to all units.
3	When something important occurs, all units are informed within a short time.
4	The organization has the capabilities or abilities necessary to ensure that knowledge flows within the organization and is shared among the different units.
	Knowledge Exploitation
1	The division of functions and responsibilities regarding the use of information and knowledge obtained from outside is clear
2	The organization has the capabilities and abilities needed to exploit the information and knowledge obtained from outside.
	Corporate Entrepreneurship:
	New Business Venturing
1	The firm has stimulated new demands on the existing products/ services in current markets through aggressive advertising and marketing.
2	The firm has broadened the business lines in current industries.
3	The firm has pursued new businesses in new industries related to current business.
4	The firm has entered new businesses by offering new lines and products/services.
	Organization Innovation
1	Our firm has significantly increased spending on new product/service development activities.
2	Our firm has significantly increased the number of products/services added by the firm and already existing in the market.
3	Our firm has significantly increased the number of new products/services that the firm introduces for the first time in the market.
4	Our firm has significantly increased the emphasis on R&D, technological leadership, and innovations.

<i>Pro-activeness</i>	
1	In dealing with competitors, the firm is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc.
2	In general, the top managers at this firm have a strong inclination toward high-risk projects (with chances of very high returns).
3	In general, the top managers at this firm believe that owing to the nature of the environment, bold wide-ranging acts are necessary to achieve the firm's objectives.
4	When confronted with decision-making situations involving uncertainty, this firm typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.
<i>Self-renewal</i>	
1	The firm has reorganized units and divisions to increase firm innovation
2	The firm has coordinated activities among units to enhance firm innovation.
3	The firm has adopted flexible organizational structures to increase innovation.
4	The firm has trained and encouraged the employees to be creative and innovative.
Innovation Performance	
1	In our firms, we are often the first to introduce new ways of working.
2	In our firm, we often introduce new products and services that are at the cutting edge of technology.
3	In our firm, we are constantly improving our business processes.
4	In our firm, we are often first to market new products and services.
5	In our firm we are willing to try new ways of doing things and seek unusual, novel solutions
Firm Performance	
1	Our firm has been able to increase its return on assets.
2	Our firm has been able to increase its return on equity.
3	Our firm has been able to increase its return on sale.
4	Our firm market share increased as compared to major competitors in the market.
5	Our firm sale growth increased as compared to major competitors in the market.

DATA COLLECTION

The firms in the sample include textile, leather, sports, food and beverages, metal and wood, furniture and others. In order to confirm the characteristics of each industry, we performed a pilot study and simple random sampling was performed, based on each cluster. We obtained data from 10 firms of each targeted city. We sent the questionnaire to all 60 CEOs to analyze the variables, by ensuring the confidentiality of data. After that, the characteristics of business were compared with non-responding business to decrease the non-response bias. The results showed that there was no significant difference between non-respondents and respondents based on the question equity return, assets return, sales return and market growth. The reliability result of the pilot study shows that Cronbach alpha value is higher than 0.70 for all constructs. In addition, to overcome the common method bias we applied Harman's test.

Table 3: Sample Distribution by Industry

Industry	No. of Firms	Percentage	Questionnaire Distributed	Questionnaire Received
Textile	1811	21	378	111
Leather	1207	14	252	69
Sports	1034	12	216	58
Food & beverages	1638	19	342	98
Metal	690	8	144	41
Wood and furniture	823	10	180	46
Others	1380	16	288	66
Total	8623	100	1800	489

To collect the full survey data, CEOs were given structured questionnaires. Based on the total population of 8623 medium-sized firms, a minimum sample size requirements is 372 (Lindner, Murphy, &

Briers, 2001). For the purpose of high response level from firms, a total of 1800 questionnaire were e-mailed; self-presented and services of survey firms were also rendered. The confidentiality of their responses were also assured to the respondents. Out of 1800 distributed questionnaires, we received 538 with the percentage of 29.88; whereas 49 questionnaires were incomplete and the remaining 489 were used in the final data file. Out of total received 538 questionnaires, 142 questionnaires were received through email, 192 questionnaires were self-administrated and the remaining 204 questionnaires were collected with the support of survey conducting firm. A summary of sample distribution by industry is presented in Table 3.

DATA ANALYSIS AND RESULTS

We used the method of partial least squares (PLS) to test the research framework because it can estimate the indicators loadings on constructs, thus analyzing construct validity and the causal relationships amongst constructs in multistage models (Fornell & Bookstein, 1982). Compared with covariance-based structural equation modeling (SEM), PLS regression is more robust and has fewer statistical identification issues as compare to covariance-based structural equation modeling. Smart PLS 3.2.6 was used to test the research framework. By following the two-step approach presented by Barjis, Gupta, and Sharda (2011), first this study examines a measurement model before analyzing structural model relationships.

THE MEASUREMENT MODEL

First, this study assessed the reliability of the construct with PLS's internal consistency measure. Table 4 shows that the constructs values of reliability were within the acceptable range. This study also analyzed convergent validity by investigating the AVE from the measures. AVE highlights the complete variance of indicators as explained by a latent construct (Fornell & Larcker, 1981). The values of AVE in this study are above the threshold value that is 0.50. Indicator and composite reliability (CR) (Fornell & Larcker, 1981) are measured whereas threshold values for the indicator reliability are 0.70 (Gliem & Gliem, 2003).

Table 4: Reliability and Validity

	Cronbach's Alpha	CR	AVE	Loading
ACAP	0.913	0.939	0.793	0.761 - 0.938
CE	0.876	0.915	0.730	0.782 - 0.924
FP	0.848	0.892	0.623	0.748 - 0.848
IP	0.909	0.932	0.733	0.836 - 0.913
ITALI	0.871	0.907	0.662	0.734 - 0.867
ITING	0.784	0.859	0.605	0.717 - 0.827

According to Soto-Acosta, Popa, and Palacios-Marqués (2017), construct validity can be measured by using two ways, convergent validity and discriminant validity of measurement items. It evaluates the consistency of multiple operationalizations and on the other hand significance of t-values of all factor loadings show the satisfactory value of convergent validity (Gefen, Straub, & Boudreau, 2000). Table 4 shows the outer loadings and all the measures presented significant loadings, representing convergent validity acceptability.

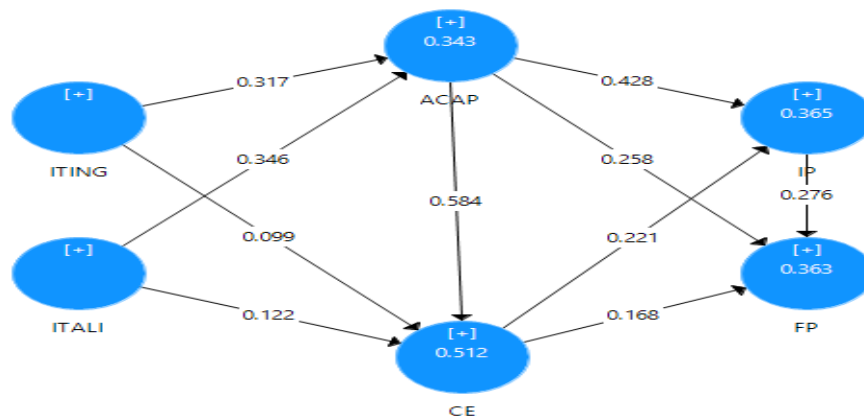
In the end, this study analyzed the measures discriminant validity of the measures. The discriminant validity of constructs is measured by assessing the values of AVE, which should be higher than squared correlation among constructs, the degree to which all constructs deviate from each other (Fornell & Larcker, 1981). The result of validity shows that all constructs fulfill the condition of discriminant validity and convergent validity. Table 5 shows the main descriptive statistics.

Table 5: Descriptive Statistics

	Mean	SD	ACAP	CE	FP	IP	ITALI	ITING
ACAP	5.446	1.018	0.891					
CE	5.731	0.934	0.698	0.854				
FP	5.929	1.168	0.536	0.492	0.790			
IP	5.663	1.093	0.583	0.520	0.514	0.856		
ITALI	5.218	0.834	0.523	0.482	0.638	0.428	0.814	
ITING	5.391	0.996	0.510	0.464	0.539	0.390	0.557	0.778

STRUCTURAL MODEL

After the appropriate and acceptable results of the measurement model, this study analyzes the research hypotheses by constructing the structural model. The empirical results of the structural model are presented in Figure 2, including the estimate path coefficient, and explanatory power. To analyze the significance of paths a bootstrap re-sample process was employed. The results of explanatory power (R^2) suggest that immense percentage on variance in FP (36.30 percent) is explained by the five constructs; furthermore, this model also accounts for 36.50 percent, 51.20 percent and 34.30 percent variance in innovation performance, corporate entrepreneurship and absorptive capacity respectively. As the main research interest of this study is performance outcomes of firm (innovation performance and firm performance).



ITING = IT Integration, ITALI = IT Alignment, ACAP = Absorptive Capacity, CE = Corporate Entrepreneurship, IP = Innovation performance, FP = Financial performance.

Figure 2: Structural Model

There were ten direct relationship research hypotheses and all hypotheses of this research were supported. Moreover, the ACAP was significantly influenced by ITING ($\beta=0.317$, $p < 0.000$), thus supporting H1. Similarly, ITING has a significant effect on CE ($\beta=0.099$, $p < 0.038$) and supporting H3. The results of H2 show that ITALI has a significant positive effect on ACAP ($\beta=0.346$, $p < 0.000$). Furthermore, ITALI has a significant positive effect on CE ($\beta=0.122$, $p < 0.026$) and supporting H4. The results of H5 show that there is a significant positive relationship between ACAP and CE ($\beta=0.584$, $p < 0.000$). In addition, ACAP has a significant positive effect on IP ($\beta=0.428$, $p < 0.000$) and FP ($\beta=0.258$, $p < 0.000$), thus supporting H6 and H7. CE also has a significant positive direct relationship with IP ($\beta=0.221$, $p < 0.003$) and FP ($\beta=0.168$, $p < 0.014$) and support the hypotheses 8 and 9. The last hypothesis presents the direct relationship between IP and FP and results show that IP has a significant positive effect on FP ($\beta=0.276$, $p < 0.000$). Table 6 presents the path coefficient (β) value and significance values of all direct relations.

Table 6: Path Coefficient

Paths	β -Values	T Statistics	P Values	Results
ACAP \rightarrow CE	0.584***	12.883	0.000	Supported
ACAP \rightarrow FP	0.258***	4.159	0.000	Supported
ACAP \rightarrow IP	0.428***	6.245	0.000	Supported
CE \rightarrow FP	0.168*	2.454	0.014	Supported
CE \rightarrow IP	0.221**	3.033	0.003	Supported
IP \rightarrow FP	0.276***	4.941	0.000	Supported
ITALI \rightarrow ACAP	0.346***	5.416	0.000	Supported
ITALI \rightarrow CE	0.122*	2.232	0.026	Supported
ITING \rightarrow ACAP	0.317***	5.477	0.000	Supported
ITING \rightarrow CE	0.099*	2.076	0.038	Supported

ITING= IT integration, ITALI= IT alignment, ACAP= absorptive capacity, CE=corporate entrepreneurship, IP= Innovation performance, FP= Firm performance.

MEDIATION ANALYSIS

This study also analyzes the indirect effect of IT capability on the performance outcomes of SMEs through ACAP and CE. The results of specific indirect paths help to analyze the sequential effect of ACAP and CE. The results demonstrate that ITING and ITALI has a significant effect on CE through ACAP ($\beta=0.202$, $p < 0.000$) and ($\beta=0.185$, $p < 0.000$). Similarly ACAP significantly mediates the relationship of ITING with innovation performance and firm performance ($\beta=0.136$, $p < 0.000$), ($\beta=0.082$, $p < 0.002$) respectively, and also mediate the relationship of ITALI with innovation performance and firm performance ($\beta=0.148$, $p < 0.000$), ($\beta=0.089$, $p < 0.003$) respectively. On the other hand, results present that CE has no mediation effect between IT capability dimensions and performance outcomes of SMEs. However, the path between IT capability dimensions and performance outcomes become significant in the presence of ACAP before CE.

This study also analyzes the mediation of innovation performance, results show that ITING and ITALI has a significant effect on firm performance in the presence of ACAP and IP ($\beta=0.041$, $p < 0.007$), and ($\beta=0.037$, $p < 0.005$). However, ITING and ITALI have no significant effect on firm performance in the presence of CE and IP ($\beta=0.007$, $p < 0.106$), and ($\beta=0.006$, $p < 0.119$). In the end, this study analyzes the indirect path between ITING and ITALI and firm performance in the presence of ACAP, CE, and IP. The results show ITING and ITALI has a significant effect on FP ($\beta=0.012$, $p < 0.016$), and ($\beta=0.011$, $p < 0.016$) in the presence of path ACAP, CE, and IP. Table 7 present the results of specific indirect paths.

Table 7: Specific Indirect Mediation Paths

Paths	β -Values	T-Statistics	P- Values
ITALI \rightarrow ACAP \rightarrow CE	0.202	5.335	0.000
ITING \rightarrow ACAP \rightarrow CE	0.185	4.626	0.000
ITALI \rightarrow ACAP \rightarrow IP	0.148	3.829	0.000
ITING \rightarrow ACAP \rightarrow IP	0.136	3.839	0.000
ITALI \rightarrow ACAP \rightarrow FP	0.089	3.026	0.003
ITING \rightarrow ACAP \rightarrow FP	0.082	3.111	0.002
ITALI \rightarrow CE \rightarrow IP	0.027	1.663	0.097
ITING \rightarrow CE \rightarrow IP	0.022	1.616	0.107
ITALI \rightarrow CE \rightarrow FP	0.021	1.371	0.171
ITING \rightarrow CE \rightarrow FP	0.017	1.388	0.166
ITALI \rightarrow ACAP \rightarrow CE \rightarrow IP	0.045	2.586	0.010
ITING \rightarrow ACAP \rightarrow CE \rightarrow IP	0.041	2.499	0.013
ITALI \rightarrow ACAP \rightarrow CE \rightarrow FP	0.034	2.340	0.020
ITING \rightarrow ACAP \rightarrow CE \rightarrow FP	0.031	2.102	0.036

Paths	β -Values	T-Statistics	P- Values
ITALI \rightarrow ACAP \rightarrow IP \rightarrow FP	0.041	2.700	0.007
ITING \rightarrow ACAP \rightarrow IP \rightarrow FP	0.037	2.833	0.005
ITALI \rightarrow CE \rightarrow IP \rightarrow FP	0.007	1.619	0.106
ITING \rightarrow CE \rightarrow IP \rightarrow FP	0.006	1.560	0.119
ITALI \rightarrow ACAP \rightarrow CE \rightarrow IP \rightarrow FP	0.012	2.411	0.016
ITING \rightarrow ACAP \rightarrow CE \rightarrow IP \rightarrow FP	0.011	2.409	0.016

GOODNESS OF FIT (GoF)

Although, the goodness of fit (GoF) indices cannot be generated by the PLS-SEM, therefore to evaluate the model explanatory power can be evaluated through considering the R^2 value (Petter, Straub, & Rai, 2007). To assess the fitness of model a diagnostic tool developed by García-Sánchez et al. (2018b) is used as the GoF index for PLS-SEM. This GoF is calculated by taking the geometric mean of AVE values and average values of R^2 . By following the guidelines of (Petter et al., 2007), this study measures the GoF as shown in Table 8. The result shows a high level of model fitness with a value of 0.520.

Table 8: Goodness of Fit

Constructs	AVE	R2
Firm Performance	0.623	
Innovation Performance	0.733	
IT Integration	0.605	
IT Alignment	0.632	
Absorptive Capacity	0.793	
Corporate Entrepreneurship	0.730	
Average Score	0.686	0.395
AVE*R2	0.271	
GoF = $\sqrt{\text{AVE} \times \text{R}^2}$	0.520	

DISCUSSION

This study examines the role of two dimensions of IT capabilities, IT integration and IT alignment and contributes to the existing literature of SMEs by tracing the indirect paths from IT capabilities to firm performance through absorptive capacity and corporate entrepreneurship as the underlying mechanism. Hence, the theoretical model has developed our understanding of how IT integration and IT alignment impact the absorptive capacity and corporate entrepreneurship to enhance SMEs performance. The findings indicate that there is an intense increase in the usage of IT in SMEs. IT integration makes it possible to enhance communication and coordination in inter-linked processes and hence, collective interpreting and problem-solving competencies tend to increase consequently (Gold & Arvind Malhotra, 2001). In addition, IT alignment is essential for the development of IT applications (Lee & Mirchandani, 2010). Furthermore, IT alignment develops the tendency to enhance communication and synchronization within the firm while providing facilitation in exploiting the firm's knowledge. In the result, absorptive capacity brings improvement and assists firms in gaining and sustaining a competitive position (Malhotra, Gosain, & Sawy, 2005). The results of this study show the consistency with prior researches and present that IT capabilities have a significant direct effect on absorptive capacity (Francalanci & Morabito, 2008; Kuratko, 2016).

Absorptive capacity in firms allows the influx of rich processes, bridges knowledge gaps and ensures the avenues to new knowledge for corporate entrepreneurship (Beheshti, Oghazi, Mostaghel, & Hultman, 2014). In addition, IT capability dimensions (IT integration and IT alignment) have a significantly positive impact on corporate entrepreneurship. As, IT integration ensures to provide a platform to encourage effectiveness and ensure efficiency in the development of the new products, by providing technological channels to flourish their entrepreneurial activities (Chaudhuri, Dayal, &

Narasayya, 2011). Furthermore, IT alignment is considered as an important source to discover diverse technological opportunities and allow the firms to achieve success by finding a way out of technical dilemmas during entrepreneurial activities. Furthermore, this study is contributing to an emerging body of literature on the outcomes of absorptive capacity and corporate entrepreneurship (Hasler, Craiu, & Rivest, 2018; Schwab, 2013). The results show that IT capabilities have an insignificant effect on performance outcomes in the presence of corporate entrepreneurship. The absence of significant effect may be due to that the entrepreneurial behavior is less common amongst the SMEs of developing economies (Miles, Paul, & Wilhite, 2003). However, in the presence of absorptive capacity this relationship becomes significant, which shows that external knowledge plays a critical role in the development of corporate entrepreneurship; in return, corporate entrepreneurship positively affects the performance outcomes of SMEs.

CONCLUSION

With the given theoretical background, the results of our study depict that IT integration and IT alignment have a significant direct relationship with performance outcomes in the presence of both intervening variables absorptive capacity and corporate entrepreneurship. Furthermore, IT capabilities affect the absorptive capacity, which in return has a positive influence on corporate entrepreneurship, and corporate entrepreneurship positively affects the performance of the firm. Hence, absorptive capacity mediates the relationship between IT capabilities and corporate entrepreneurship, and corporate entrepreneurship mediates the relationship between absorptive capacity and firm performance. Therefore, the sequence of the variable is important to find the performance outcomes of the SMEs. However, corporate entrepreneurship has no mediating effect between IT capabilities and firm performance. Corporate entrepreneurship only mediates the relationship in the presence of absorptive capacity. In general, this study has provided, perhaps for the first time, the indirect empirical analysis of the relationship between IT capability dimensions (IT integration and IT alignment) and two different performance outcomes of SMEs (innovation performance and financial performance) in an extensive framework.

PRACTICAL IMPLICATION

To achieve high-performance goals, the firms especially manufacturing SMEs, invest hugely on IT-related activities. However, if firms are not able to enhance their IT capabilities to leverage dynamic capabilities then such investments may not enable the firm to reap the benefits out of the yield derived from IT capability dimensions and therefore, they will not be able to reach their highest level of efficiency. It is necessary for managers to apply their firms' IT capabilities to develop dynamic capabilities, such as absorptive capacity and corporate entrepreneurship, which further improves the performance of the firm.

The framework analyzed in this study intends to serve as a roadmap for CEOs of manufacturing sector SMEs of Pakistan for the better identification and assessment of the business environment while developing policies and strategies. The hypothesized framework encourages the development of such channels through which the essential dynamic capabilities inside the firm are flourished. The firms can also exploit their resources so that proactive steps can be taken to improve the business competitiveness which helps firms to increase performance. Furthermore, this study encourages the young entrepreneurs to establish their own business and provide them with the important guideline that how they can survive their business through dynamic environment with the help of external information, knowledge and entrepreneurial activities.

LIMITATIONS AND FUTURE RESEARCH

There are some limitations to this study. First, our data is self-reporting and survey-based, so it may be subjected to social desirability bias (Podsakoff & Organ, 1986). However, anonymity assurance reduces this bias even when the response rate is required regarding critical topics (Konrad &

Linnehan, 1995). Secondly, even though Harman's one-factor test as well as the other techniques tested could not found common method variance as a problematic concern. (Konrad & Linnehan, 1995) has also argued that it is improper to consider that using a single method inevitably introduces a systematic bias, hence, it is recommended that upcoming research studies may choose such scales of measurement related to independent variables and dependent variables from diverse data as a bases so as to decrease the impact of even a slight chance of response bias. Furthermore, other dynamic capabilities may also be analyzed that can have an influence on SMEs performance and the dimensional role of these dynamic capabilities may also be analyzed.

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BIOGRAPHIES



Rana Nabeel-Rehman is a lecturer of Institute of Business and Management at University of Engineering and Technology, Lahore. He holds MS in Business Administration and PhD in Business Management from University of Malaya.

His special interests include Information Technology, Entrepreneurship, Knowledge Management and Small Business Management.



Mohammad Nazri is a senior lecturer in Management and the coordinator for Bachelor of Business Administration (BBA) at the Faculty of Business & Accountancy, Universiti Malaya. He holds a Doctorate in Business Administration from the University Teknologi MARA. His industrial experience was with RHB Investment Bank spanning over 10 years.

His research interest includes Management, Organization Behavior, and Knowledge Management. His major areas of teaching include Human Capital, Leadership, Business Ethics and Islamic Perspectives in Business.