

ENTREPRENEURIAL ORIENTATION, KNOWLEDGE MANAGEMENT AND PERFORMANCE: MEDIATING ROLE OF BIG DATA ANALYTICS AND MODERATING ROLE OF TECHNOLOGICAL TURBULENCE

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Abstract

The purpose of the study is to explore the deteriorating situations of SMEs in Qatar. The purpose is to suggest a quantitative model to be evaluated because the government is paying special attention towards the promotion of SMEs but hardly any significant improvement has been seen. Based on the reviewed literature over the entrepreneurial performance of SMEs, it has been seen that entrepreneurial orientation and knowledge management has a significant role, meanwhile big data has the capability to bridge the impact of entrepreneurial orientation and knowledge management over entrepreneurial performance of SMEs in Qatar. Moreover, considering the dynamic nature of the country and continuously changing technological advancements, technological turbulence has been proposed as a moderator between the same relationship. The framework is built over the theoretical underpinning of resources-based view with the support of contingency theory. The model is suggested to be evaluated through SPSS for initial diagnosis of the collected data and afterwards SMART PLS is proposed.

Keywords: *Performance, entrepreneurial orientation, knowledge management, big data, technological turbulence*

1.0 Introduction

Organizations must investigate the idea of entrepreneurship from multiple perspectives due to the economic crisis that was experienced by the developing as well as developed economies (Sulaiman, Asad, Awain, Asif, & Shanfari, 2024). Government institutions have catered to the important and significant impact that entrepreneurship plays in promoting economic growth and reducing the unemployment rate (Ta'Amnha, Magableh, Asad, & Al-Qudah, 2023). Small and Medium Enterprises (SMEs) assist fresh graduates in developing their entrepreneurial abilities, which will ultimately allow them to either continue to look at jobs or pursue another method (Asad, Fryan, & Shomo, 2025).

SMEs play a significant role in the economy of Qatar as 97% of the private sector belong to SMEs (Thani, 2022). Another factor due to which the importance of SMEs in Qatar cannot be ignored is that 35% of the employment generation is done by the SMEs in Qatar (Qatar Development Bank, 2016). Despite this significant contribution in the employment only 46% of the SMEs in Qatar have HR department (Younis & Elbanna, 2022), which shows lack of knowledge management in SMEs of Qatar (Alenzi, 2023).

SMEs in Qatar hardly contribute 10% to the GDP of the country as compared to the SMEs of high-income countries like Qatar, where their contribution is up to 50%. In Qatar currently the employment rate is 7% of the entire working human resource (Menon, 2023). Like other developed or progressing economies the government of Qatar is also playing significant attention towards SMEs to shift their dependability from oil (Safari, Saleh, & Ismail, 2022).

However, SMEs are still not successful in strengthening the national economy of Qatar, which is unexpected given their significance in accomplishing both Sustainable Development Goals (SDGs) as well as community development objectives (Noor, Eva, & Maria, 2020). Likewise, importance of big data cannot be ignored as a basis to clearly conceptualize future forecasting (Mangla, Raut, Narwane, Zhang, & Priyadarshinee, 2020). Considering SMEs entrepreneurial performance, it is considered to be a crucial component of their success in such scenario where foreign businesses give a significant challenge to the

local enterprises to endure in fierce competitive (Cappa, Oriani, Peruffo, & McCarthy, 2021; Khan, Asad, Khan, Asif, & Aftab, 2021).

Literature over the performance of SMEs is abundant, likewise, literature linking Entrepreneurial Orientation (EO) and performance is also available, but with certain controversies in findings where some claim that EO has a positive impact (Asad, Asif, Khan, Allam, & Satar, 2022; Asad, Asif, Sulaiman, Satar, & Alarif, 2023; Asad, et al., 2024), some contradicted the claim (Harms, Reschke, Kraus, & Fink, 2010) and some identified a U shaped relationship (Kreiser, Marino, Kuratko, & Weaver, 2013), calling further research over the relationship between EO and performance.

Along with EO, another important this is Knowledge Management (KM). SMEs, functioning in today's extremely volatile environments where knowledge-based economies are causing things to change quickly (Albream & Maraqa, 2019), should regularly adopt themselves in accordance with the market situations. For entrepreneurial firms, exploration and exploitation of knowledge is among the top most activities (Partanen, Kohtamäki, Patel, & Parida, 2020; Asif, Asad, Kashif, & Haq, 2021; Kanaan, Alsoud, Asad, Ta'Amnha, & Al-Qudah, 2024). Meanwhile, KM is considered as a major factor for enterprises (Asad, 2024). Through the implementation of knowledge management, SMEs can achieve competitive advantage in the market, which is missing in SMEs of Qatar (Mehrez, 2019; Hassen, 2021). Hence, there is a dire need to address knowledge management in the context of Qatar.

Considering the inconsistencies in the prior literature, it is important to identify the intervening variables (Baron & Kenny, 1986; Chmura Kraemer, Kiernan, Essex, & Kupfer, 2008; Zhao, John G. Lynch, & Chen, 2010). In the current digital era, Big Data (BD) has become advantageous in today's digitalized world as enterprises (Awain, Asad, Sulaiman, Asif, & Shanfari, 2025), the supply chain of enterprises which normally provides enormous volume of data as the firms massive quantity of data is provided by the mechanisms of supply chain which are modern (Awain, Sulaiman, Sheyadi, & Sukati, 2025).

However, in Qatar, the importance given by SMEs over BD is limited which is the major reason behind retard growth of SMEs in Qatar and their low contribution to the GDP and employment (Fernandez & Ali, 2015; Al-Ali, Gorgenyi-Hegyes, & Fekete-Farkas, 2020; Abdelfadil, Thomas, Rees, & Suliman, 2023). Hence, even though BD is receiving attention of the academicians but in Qatar, small business owners are very careful about investment in blooming technologies for innovation (Satar, Alharthi, Asad, Alenazy, & Asif, 2024). Business from Gulf economies like Qatar are not convinced about the application and potential benefits of BD (Cappa, Oriani, Peruffo, & McCarthy, 2021). Regardless of the significance of BD, research on the influence of EO on the adoption of BD, particularly in Gulf nations like Qatar, is still comparatively new.

Academicians claim that in addition to being successful factors, technical innovation and global competition have a major operational impact on improving entrepreneurial performance (Albream & Maraqa, 2019). While doing so, enterprises must deal with a high degree of Technological Turbulence (TT) as well as rapid structural changes (Desamparados & Domenech, 2018). In the available literature, researchers have analyzed the moderating role of TT (Ta'Amnha, Alsoud, Asad, Magableh, & Riyadh, 2024), but in the context of Qatar it is missing. Furthermore, research on SMEs' adoption of BD has typically only examined the direct effects on entrepreneurial performance (Bag, C. Wood, Xu, Dhamija, & Kayikci, 2020) or indirect impact (Shahzad, Qu, Zafar, Rehman, & Islam, 2020) and the mediating role of BD (Mangla, Raut, Narwane, Zhang, & Priyadarshinee, 2020) however, TT has not been studied with EO as well as BD while BD is highly significant in the unstable market conditions.

The Contingency Theory (CT) recognizes the idea of technological turbulence (Luthans & Stewart, 1977). TT had a moderating effect over the link among strategic orientation and the entrepreneurial performance of SMEs while ignoring the significance of BD (Balodi, 2020). Thus, the gap exists specifically in the progressing economies context reason being the synergetic influence of EO and KM in a technologically turbulent conditions has received scarce attention by previous researchers, particularly in Qatar. Therefore,

the theoretical as well as empirical study over EO and KM while catering the mediating role of BD and moderating role of TT has not received enough attention, hence, the current research using the underpinning support of contingency theory fills the gap in RBV.

1.2 Literature Review

This section discusses entrepreneurial performance of SMEs. What explains entrepreneurial performance of SMEs (Asad & Kashif, 2021)? Very little is understood regarding entrepreneurial performance, because SMEs in such economies are hardly registered and no formal data is available for them (Adel, Mahrous, & Hammad, 2020). An appropriate metric that offers current data on the assessment of entrepreneurial performance, particularly regarding SMEs, is not widely agreed upon (Abbas & Khan, 2023). Entrepreneurial performance of SMEs is influenced by financial, market, competitive, and regulatory factors (Jasra, Khan, Hunjra, Rehman, & Azam, 2011; Damer, Al-Znaimat, Asad, & Almansour, 2021).

Based on the literature out of all the constructs that influence entrepreneurial performance of SMEs, it has been observed that EO and knowledge management are considered as crucial (Abbu & Gopalakrishna, 2021). Knowledge management and entrepreneurial orientation unidimensional or multi-dimensional are supposed to have a critical influence over entrepreneurial performance of SMEs (Ta'Amnha, Magableh, Asad, & Al-Qudah, 2023), however, technological turbulence and big data have been ignored in this synergetic relationship (Sulaiman & Asad, 2023). Hence, lack of knowledge management and EO results in decline of entrepreneurial performance of SMEs (Albreem & Maraqa, 2019).

In this study, entrepreneurial performance of SMEs has been measured based on the perception of entrepreneurs regarding different measures of performance i.e. income, output, investment and employment (Asif & Bakar, 2025). This has been done because of the globally known practice of SMEs owners to keep informal accounting records (Alkhuzai, et al., 2024). This practice exists due to the low level of education of the owners. Asad et. al., (2021) measured performance because of perception of entrepreneur regarding sales less costs, which is represented by income, alteration in output, sales, alteration investment, and alteration in the human resource of the firm (Sulaiman, 2025).

2.1 Entrepreneurial Orientation

Entrepreneurial orientation is the most essential resource, like knowledge management. EO is considered as the topmost significant resource along with other resources like capabilities in marketing (Asad, et al., 2024). The study reveals that EO is a strategic resource which helps organizations in gaining competitive advantage. Entrepreneurial characteristics involve independence, innovativeness, pro-activeness, and behavior of risk taking (Ferraris, Mazzoleni, Devalle, & Couturier, 2019). Therefore, the framework of EO must originate from aims of study, and hardly there is any solitary tactic that has been decided for research on EO (Freixanet, Braojos, Rialp-Criado, & Rialp-Criado, 2021).

A small business must also have an EO in order to succeed because it affects strategic decisions (Asad, Majali, Aledeinat, & Almajali, 2023). On the other hand, EO is a component of a strategic attitude that is exhibited by a firm's willingness to take chances, act in a highly risky manner as well as depend on regular product innovation.

Resourcefulness includes information of best industrial practices, product range, and market drifts (Aribaba, Asaolu, & Olaopa, 2011). Innovative decision-making tendencies are other features and ambition which are considered crucial (Asad, Aledeinat, Majali, Almajali, & Shrafat, 2024). Literature asserts experience of the work is main characteristic of the entrepreneur which is supposed to be at least three years which is considered as enough for such an evaluation.

According to Satar, Alharthi, Asad, Alenazy, and Asif (2024), entrepreneurial orientation is regarded as a crucial factor that improves the performance of small and micro enterprises in addition to large and medium-sized enterprises. However, Runyan, Droge, and Swinney (2008) identified an inverse influence of EO over entrepreneurial firms. Thus, it clearly shows ambiguities in the body of knowledge available for the entrepreneurial performance, while majority of the studies have supplemented the claim that EO holds a

positive influence over performance. EO encompasses all of an organization's management practices, including autonomy, innovativeness, risk-taking, pro-activeness, and competitive aggressiveness (Asad, Asif, Khan, Allam, & Satar, 2022). The two characteristics that have the least or no link with SMEs especially in Qatar due to the country structure, are autonomy and competitive aggressiveness.

Based on reviewed literature, it would be correct to say that EO is significant because SMEs that are more entrepreneurial in their orientations also achieve greater market share and better financial performance as compared to less entrepreneurial SMEs. Despite the importance of EO, owners of SMEs in the middle east hardly opt for EO in their business activities (Sulaiman, Asad, Awain, Asif, & Shanfari, 2024), which is the key reason behind adding EO in this study.

1.3 Knowledge Management

Knowledge Management (KM) is the part of strategic resource of enterprises which helps in gaining competitive advantage (Abbas, Raza, Nurunnabi, Minai, & Bano, 2019). Information revealed from the subunits of the enterprises have their own perspectives, to contribute to the firms' value by enhancing its competence to respond to new and unforeseen situations (Ahmad & Al-Shbiel, 2019). KM is referred to as the procedure for drawing and leveraging the combined information in enterprises to compete effectively (Albort-Morant, Leal-Rodríguez, & Marchi., 2018).

Understanding KM in SMEs is critical given their importance as drivers of economic growth, employment, technical progress, and structural change (Durst, Foli, & Edvardsson, 2024). Knowledge which can be documented is considered as explicit knowledge, categorized, and disseminated with others all at the same time (Alzghoul, Elrehail, Emeagwali, & AlShboul, 2018). Some of the benefits of effective KM utilization is improved customer service, cost reduction, good decision-making, creativity, rapid creation of new product lines, enhanced corporate image, prompt and effective problem solutions, and effective sharing of best practices (Antunes & Pinheiro, 2020). The aim of KM is to manage information that is dispersed between the individuals, departments, as well as branches of the organization (Ferraris, Mazzoleni, Devalle, & Couturier, 2019).

KM may be seen as an organized creation, procurement, sharing and dissemination of information within a given firm, with a view of achieving organizational goals (Arias-Pérez, Velez-Ocampo, & Cepeda-Cardona, 2021). Therefore, performance can be attributed to the effective and efficient utilization of knowledge (Ayoub, Abdallah, & Suifan, 2017). Hence, KM is aimed at enabling and encouraging knowledge transfer between an organization and its entities such as individual employees, communities as well as various organizational units. KM is the process of transforming information into actions and making it useful to those who can use it (Castro, López-Sáez, & Delgado-Verde, 2011).

Different scholars conducted several studies to access the success factors in KM (Shehzad, Zhang, Latif, Jamil, & Waseel, 2023). KM processes are significant for organizations to follow for achieving efficiency (Ouakouak, AlBuloushi, Ouedraogo, & Sawalha, 2021). However, knowledge possession alone would not ensure the attainment of strategic benefit (Ouakouak, AlBuloushi, Ouedraogo, & Sawalha, 2021). Informal gathering between experts and other practitioners assures good knowledge transfer (Okour, Chong, & Asmawi, 2019).

The systematic review of literature identified that state-of-the-art of KM from the management point of view shows that SMEs are dependent over KM to enhance firm's performance (Cerchione, Esposito, & Spadaro, 2017). Research shows that knowledge utilization takes place because of effective organizational structure (Mardani, Nikoosokhan, Moradi, & Doustar, 2018). The effective knowledge utilization depends on understanding of roles for the achievable benefits from the suppliers (Martínez-Costa, Jimenez-Jimenez, & Rabeh, 2019). Thus, considering the significance and issues in the KM it is necessary to conduct study especially in the context of Qatar where KM is hardly given any significant consideration.

1.4 Big Data

Big data is the tendency of the firm to collect, interpret, and derive decisions based on the information collected over the years. Now a days big data is gaining importance even in developing countries. The influence of resources in a challenging business situation was examined (Donnellan & Rutledge, 2019), however, the impact on SMEs has not been examined, indicating a significant gap in the literature on SMEs. Big data is recognized as a turning point for firms to improve their performance. Although SMEs are crucial for every economy, they are lagging far behind in the usage of BD because of limited resources.

SMEs engaged in adaptation based on information obtained from BD are more efficient. SMEs employ such tactics by shaping their procedures in response to information obtained from BD (McCarthy, Puffer, & Lamin, 2018) whereas, SMEs can make better plans if the data is easily accessible to them. Therefore, organizations with EO and BD skills improve performance by offering superior products and services while lowering market risk. In addition, they generate values which supersede cost of invention in order provide benefits that are higher than normal (Alshanty & Emeagwali, 2019).

BD mediation effect in the relationship between technological, organizational and environmental contexts, and SMEs performance has already been conducted in the past (Maroufkhani, Ismail, & Ghobakhloo, 2020), however, its linkage with EO in the technologically turbulent environment is still missing. Likewise, there is a dearth of literature in the Arab countries a study investigated the relationship between EO and performance through the mediating role of absorptive capacity in SMEs in the Kingdom of Saudi Arabia (KSA) as an emerging economy provides the empirical insights (Alshahrani & Salam, 2023). It suggests the positive mediating role of absorptive capacity between EO and performance. Yet the role of big data between the same is still missing, which calls for research over the same.

1.5 Technological Turbulence

Since the turn of the millennium, several industries have seen significant technological advancements that have accelerated change and raised turbulence levels consistently. Technological turbulence has recently gained even more concern since enterprises can no longer sustain a competitive edge by just owning a particular set of valuable, rare, inimitable, and non-substitutable resources (VRIN). This occurred as a result of the constantly changing needs, which call for various kinds and combinations of resources to be fulfilled. For these reasons, even while firms face difficulties in trying to hold onto their competitive advantage in an environment where technology continues to change and the relationship between resources and abilities is dynamic (Santos, Beuren, Bernd, & Fey, 2023). Researchers have suggested that firms need to perform better, they should make significant technological investments and use more innovation when there is a high turbulence.

Technological turbulence can be explained by two main sources: changes in customer preferences, competition, and resource uncertainty on the external side, and changes in policy brought about by new technology on the inside (Martin, Javalgi, & Ciravegna, 2020). It was discovered that SMEs in the manufacturing sector have experienced both high and low levels of technical turbulence due to both internal and external influences based on these characteristics (Li, Kwok, Zhang, & Gao, 2020). It is a vital component that supports national economic growth, globalization, and the competitiveness of the firm throughout its existence (Ogbeibu, Emelifeonwu, Senadjki, Gaskin, & Kaivo-oja, 2020).

Since prior research had suggested that environmental turbulence has no influence on performance when examined directly, but that it does have an effect when tested as a moderator, it is imperative to investigate the moderating impact of technological turbulence, which reinforces the influence of technological turbulence as a performance moderator (Zellweger & Sieger, 2012). As a result, prior research on performance has demonstrated that technological turbulence modifies the relationship among organizational abilities and performance.

1.6 Framework and Hypothesis Development

The Resource-Based View (RBV) of enterprises is a view that suggests a firm's resources and tendencies are key drivers for achieving performance. EO, being a part of strategic posture of the enterprise, for which RBV provides a solid framework for establishing how resources lead to and support EO (Albhirat, Zulkiffli, Salleh, & Zaki, 2023). Moreover, RBV underscores the role of dynamic capabilities in knowledge management (Ali, Hussin, Haddad, Alkhodary, & Marei., 2021). Effective knowledge management involves developing dynamic capabilities that allow firms to acquire new knowledge, assimilate it into existing processes, and apply it innovatively to create value. Thus, RBV argues for the lasting competitive advantage which can be achieved through valuable, rare, inimitable, and non-substitutable (VRIN) resources (Cuthbertson & Furseth, 2022) and EO along with KM can provide or act as VRIN resources.

Furthermore, majority of the studies that have been conducted over technological turbulence has undertaken the support of contingency theory (Ta'Amnha, Alsoud, Asad, Magableh, & Riyadh, 2024). The main reason behind linking technological turbulence is that technological turbulence can have a positive impact of firms succeeding in managing the change in accordance with the change in the technology (Asad, Majali, Aledeinat, & Almajali, 2023). Hence, contingency theory is the most appropriate theory to support technological turbulence. Contingency theory emphasizes the importance of aligning organizational structures, strategies, and processes with the external environment (Eva, Sendjaya, Prajogo, Cavanagh, & Robin, 2018). In the context of technological turbulence, organizations must assess and adapt to the pace and nature of technological change. Contingency theory argues that organizational design should be contingent upon external factors, including technological changes (Rashidirad, Salimian, & Soltani., 2018).

Consequently, considering the underpinning of RBV and with CT's assistance, the following framework has been created in Figure 1, clearly stating the ways in which EO, KM, and BD adoption are expected to affect SMEs' entrepreneurial performance as well as the moderating role of TT in the link among EO, KM, and BD and SMEs' entrepreneurial performance. Applying BDA, considering RBV logic, aids SMEs in enhancing

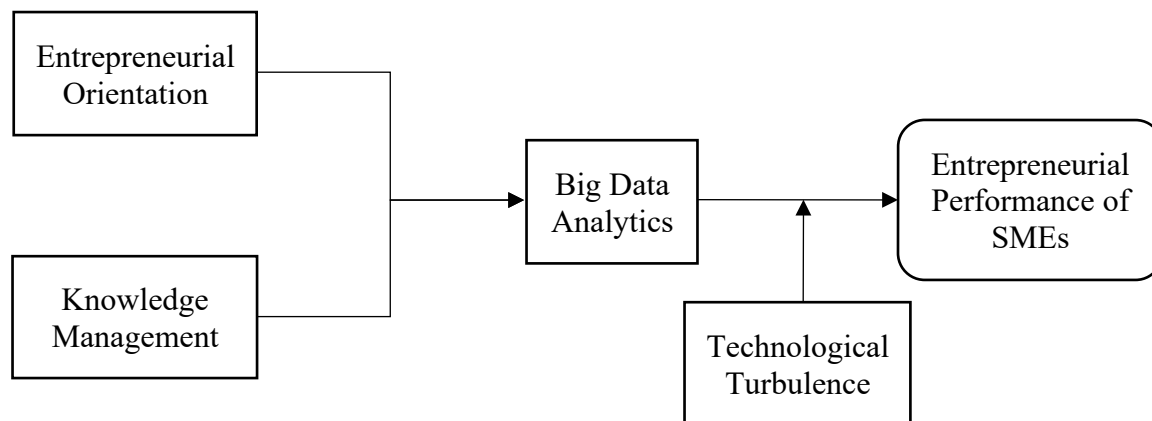


Figure 2.1 Research Framework

their capacity to convert unprocessed data into information that is beneficial for improving performance. This collected information is used by managers to reduce uncertainty (Alberto, Mazzoleni, Devalle, & Couturier, 2019). Like this, BD insights give organizations many chances to reorganize resources in a way that will better enable them to deal with a technologically turbulent environment while utilizing big data (Salvato & Vassolo, 2018). Over the past decade, RBV has attracted a lot of attention, but its sensitivity to context is still unclear, therefore it is essential to understand how TT affects RBV. Researchers offered a contingent viewpoint among the opposing viewpoints, arguing that the advantages of RBV vary depending on the circumstance in which these capabilities are used.

1.6.1 Entrepreneurial Orientation and Entrepreneurial Performance of SMEs

EO is a process of developing strategies which is crucial for SMEs. Researchers have used the main operationalization of EO as a comprehensive construction which shows a single unit construct instead of dividing it into five dimensions of innovativeness, risk-taking, and proactiveness (Asad, Asif, Bakar, & Altaf, 2021). In the multidimensional approach, EO changes based over the business and market situations. However, considering the understanding level of the entrepreneurs in a developing country like Qatar, the variable has been taken as uni dimensional as studied in past (Asad, Asif, Khan, Allam, & Satar, 2022; Asad, Asif, Sulaiman, Satar, & Alarifi, 2023). Moreover, EO is directly supported by the theoretical underpinning of RBV, because according to RBV, EO fulfills all the conditions for being a critical resource that may provide success to the firms.

Several researchers focused over explaining the relationship among EO and performance, however, entrepreneurial performance of SMEs has gained little attention, reason being, SMEs with strong EO outperform compared to others in the same industry (Ta'Amnha, Magableh, Asad, & Al-Qudah, 2023). Recently, it has been observed that instead of identifying the direct relationship indirect relationship among EO and entrepreneurial performance of SMEs is gaining importance, yet the significance of EO for achieving performance cannot be underestimated. Researchers identified that in the current digitalization era (Fadhel, Aljalalma, Almuhanadi, Asad, & Sheikh, 2022), big data is among the major missing links between EO and performance. However, initially the direct impact of EO and entrepreneurial performance of SMEs is hypothesized.

H₁: Entrepreneurial orientation has a significant impact of entrepreneurial performance of SMEs in Qatar.

1.6.2 Knowledge Management and Entrepreneurial Performance of SMEs

Knowledge Management (KM) is highly reliant on the capabilities of an SME. KM includes several aspects of knowledge (Asif, Asad, Kashif, & Haq, 2021). KM capabilities can be summed into three interrelated processes. These three processes include knowledge acquisition, knowledge conversion, and knowledge application. KM is not merely a critical resource for SMEs, but a crucial and significant actor for achieving competitive advantage (Kanaan, Alsoud, Asad, Ta'Amnha, & Al-Qudah, 2024). Hence, KM refers to knowledge management procedures which are developed through knowledge which helps in entrepreneurial performance of SMEs (Hock-Doepgen, Clauss, Kraus, & Cheng, 2021). The researchers studying KM have mostly taken the theoretical support of RBV or another theory that is driven by RBV which is Knowledge Based View (KBV), hence, the study focused over RBV, because KM is a major resource for achieving superior performance.

Several tactics to KM focus over identification, capturing, storage, mapping, dissemination, and creation of existing, or new knowledge. Km is composed of developing visible knowledge along with developing a culture which promoted knowledge intensity (Li, et al., 2020). Therefore, it would be right to claim that exploration and exploitation of knowledge are key for KM. KM relationship with entrepreneurial firm performance has hardly gained importance, moreover, the role of big data has hardly been addressed with the context of a progressing country (Kanaan, Alsoud, Asad, Ta'Amnha, & Al-Qudah, 2024). KM highlights the importance for availability of available knowledge which is stored with the organization in the form of different databases, commonly termed as big data. Therefore, the following hypothesis has been developed:

H₂: Knowledge management has a significant impact of entrepreneurial performance of SMEs in Qatar.

1.6.3 Mediating Role of Big Data

Big data is extremely helpful in understanding and shaping critical issues. Several researchers have discussed big data as an independent variable and confirmed the significant role played by BDA. Big data can provide a complete solution to complicated decision making for the entrepreneurial performance of SMEs. However, adopting big data require an entrepreneurial mind because entrepreneurial firms are more proactive towards the market changes and are willing to take risk actively. Entrepreneurial orientation as mentioned earlier focused on relying on innovativeness, proactiveness, and risk taking. These characteristics

help the SMEs in adopting big data which improves their performance. In different studies researchers have used different theories to support Big Data.

Hence, investment in big data is usually made by dynamic enterprises. Hence, there is no doubt that big data plays a crucial role in strengthening the entrepreneurial performance of SMEs (Asad, Asif, Bakar, & Altaf, 2021). Moreover, knowledge management as discussed earlier includes capturing, storing, mapping, disseminating, and creating knowledge, for which big data is required (Asad, 2024). Hence, considering the role of KM and EO for adopting big data and consequently gaining entrepreneurial performance, the mediating role of big data is proposed in this study. Therefore, the following hypotheses are proposed.

H₃: Big data mediates the relationship between KM and entrepreneurial performance of SMEs in Qatar.

H₄: Big data mediates the relationship between EO and entrepreneurial performance of SMEs in Qatar.

1.6.4 Moderating Role of Technological Turbulence

The concept of Technological Turbulence (TT) is mostly researched with environmental turbulence and analyzed as past or future environmental factor that SMEs face. Technological turbulence is the part of external environment, and its intensity is as uncontrollable factor for SMEs as they hardly have any control, but it influence entrepreneurial performance of the SMEs, that is why it is taken as a moderating considering it to be an external factor (Hammami, Ahmed, Johny, & Sulaiman, 2021).

In such an innovative environment, where technological advancements are regularly taking place, TT prevails along with its practical significance and thus cannot be ignored (Abbas & Hassan, 2017). TT can be viewed as destructive as well as constructive perspective. However, destructive changes play a significant negative role for achieving entrepreneurial performance. Meanwhile the constructive part may result in the development of new products and services. Hence. In accordance with the contingency theory TT may play a positive role, only if the SMEs can handle the change with the pace of change in the technology (Ta'Amnha, Alsoud, Asad, Magableh, & Riyadh, 2024).

Sectors with high level TT face more challenges (Ogbeibu, Emelifeonwu, Senadjki, Gaskin, & Kaivo-oja, 2020). Changing technologies creates uncertainty regarding entrepreneurial performance, hence its moderating effect cannot be underestimated (Ta'Amnha, Alsoud, Asad, Magableh, & Riyadh, 2024). Therefore, TT is considered to have a moderating impact in this research over the relationship between EO, KM and entrepreneurial performance of SMEs, and consequently, the following hypotheses are developed to detect the moderating impact of technological turbulence on entrepreneurial performance of SMEs:

H₅: Technological turbulence moderates the relationship between knowledge management and entrepreneurial performance of SMEs in Qatar.

H₆: Technological turbulence moderates the relationship between entrepreneurial orientation and entrepreneurial performance of SMEs in Qatar.

1.7 Research Methodology

Research methodology outlines how the study will collect, measure, and analyze the data (Cooper & Schindler, 2006). In this study, a quantitative methodology is suggested, which involves gathering and analyzing numerical data to represent the phenomenon being studied (Hair J. F., 2007). A survey method is suggested to gather primary data from respondents and assess their thoughts, feelings, and opinions on a given situation (Harrison, Henderson, Alderdice, & Quigley, 2019). Thus, a survey method utilizing questionnaires as the primary data collection instrument is considered the most suitable approach for this research. This is due to the research focuses on collecting data from SME owner-managers in Qatar to evaluate the mediating role of big data and moderating impact of technological turbulence among KM, EO, and entrepreneurial performance of SMEs in Qatar. Additionally, the researcher can develop models that illustrate these relationships (Hair, Black, Babin, & Anderson, 2010).

1.7.1 Unit of Analysis

The unit of analysis is a vital concept in the survey of study, as it determines the level of data aggregation that will be used for data collection and analysis. The unit of analysis could be an individual, group, organization,

community, or any other unit of measurement. In the current research, the unit of analysis is organization i.e., SME. The owners and managers of SMEs have been selected as respondents, as they are key informants (Asad, 2024) The main reason behind choosing service sector is that the government develop policies for SMEs regardless of the sector and treat all the sectors equally (Qatar Development Bank, 2020).

1.7.2 Population

To commence the process of studying a population, the initial phase involves establishing the overall size of the population. The term 'population' pertains to a collection of individuals, objects, or incidents of relevance for analysis, whereas 'sample' denotes a portion of the population (Sekaran & Bougie, 2016). The complete assemblage of people, events, or things which are interesting to investigate constitutes the population. In the context of this study, the population encompasses the SMEs that operate within Qatar, which amount to a total of 25,000 entities (Business Startups Qatar, 2020). However, considering the focus of the government of Qatar, only sector of services is included in the study because service sector SMEs have the major share in the SMEs sector. The government of Qatar is trying to diversify the economy (Business Startups Qatar, 2020) from Oil based revenue to other sectors, and SMEs are gaining significant attention in terms of tax reliefs as well (Gueydi & Haq, 2022), but yet their performance and growth is not going as expected, hence the focus of this study is over the service sector SMEs operating in Qatar.

1.7.3 Sampling

For this study, the samples were drawn from the population of SMEs operating within Qatar. According to the Qatar Development Bank, the entire population of SMEs in Qatar ranges up to 25000. As there is no distinction available over the website of chamber of commerce or small and medium enterprise development authority, hence all the SMEs are accounted for calculating the sample size, however, while choosing the respondents only service sector SMEs will be chosen because the major decline has been seen in the service sector SMEs in the last few years (Yuanzhu, Tan, Li, & Tse, 2018; Alenzi, 2023). The Morgan Kerjice formula is a widely used formula for determining the appropriate sample size in survey research. It considers the desired confidence level and margin of error, as well as the variability of the population being studied. In the current study, the sample size was determined using a 95% confidence level and a 5% margin of error, which are commonly used standards in survey research. Thus, the sample size for this study is 384.

According to Creswell and Creswell (2017), there are two types of sampling methods: probability and non-probability sampling. In probability sampling, each element of the sample has an equal chance of being selected from the population. On the other hand, non-probability sampling methods involve selecting individuals based on specific characteristics and the results cannot be extended to the entire population. For this particular research, the approach used for sampling was systematic random sampling, which is a kind of probability sampling (Quinlan, Zikmund, Babin, Carr, & Griffin, 2018). Systematic random sampling is an appropriate sampling technique for research studies that involve a relatively large population of 100 or more and where there is a pre-existing list of the population available.

1.7.4 Operationalization and Measurement of Variables

Operationalization of variables is the act of defining and measuring the concepts being studied in a way that allows them to be analyzed and quantified (Creswell & Creswell, 2017). The current research context was considered when selecting the measurements, which were adapted from previous studies (Sekaran & Bougie, 2016). The study employs a research model that includes six constructs, and all items are measured using a Likert scale. The Likert scale has been widely used in social sciences research and has been found to be a reliable and valid measurement tool for a variety of constructs (Zikmund, Babin, Carr, & Griffin, 2013). The close-ended questionnaire allows respondents to make choices easily and enables the researcher to code the data efficiently for further analysis (Quinlan, Zikmund, Babin, Carr, & Griffin, 2018). The owners and managers of SMEs were asked different statements for which they must choose one option where; 1 represents strongly disagree, 2 represents disagree, 3 represents neutral, 4 represents agree, 5 represents

strongly agree. The questionnaires were distributed in person because the response rate for mailed questionnaires in Qatar is known to be exceptionally low.

In this study, entrepreneurial performance of SMEs is considered the dependent variable, and its measurement is explained below. To measure Entrepreneurial Performance of SMEs, the study uses items that have been found reliable in prior literature. The items measure the increase in income, increase in sales, increase in investment, and increase in overall assets. These items were adapted from previous studies (Asad, Aledeinat, Majali, Almajali, & Shrafat, 2024; Satar, Alharthi, Asad, Alenazy, & Asif, 2024). The final questionnaire used for measuring entrepreneurial performance of SMEs. Entrepreneurial orientation is defined as “the entrepreneur’s strategic orientation reflecting a willingness of an enterprise to engage in entrepreneurial behaviors.” This study investigated the three EO dimensions of innovation, proactiveness, and risk-taking and considers EO as a uni-dimensional concept that encompasses all three aspects of risk-taking, proactiveness, and innovativeness following the previously published studies (Asad, Asif, Khan, Allam, & Satar, 2022; Asad, et al., 2024). The questionnaire items that are used to measure EO.

Knowledge management is measured in terms of the attitude of the owners and managers for identifying, capturing, storing, mapping, disseminating, and creating knowledge. It covers the aspects through thirteen items that have been adopted from previously published studies (Asad, 2024; Kanaan, Alsoud, Asad, Ta’Amnha, & Al-Qudah, 2024). The questionnaire items that are used to measure the whole variable as used by previous researchers. Big data covers all the activities that organizations perform to collect, store, process and convert the raw data into information. The scale for measuring big data has been adopted from previously published studies (Wamba, et al., 2017; Asad, Asif, Khan, Allam, & Satar, 2022) containing nine items. The questionnaire items that are recommended to be used to measure BD. The variable technological turbulence has been added to the framework as a moderator. The items suggested to be used in the measurement of technological turbulence have been adopted from prior studies (Ta’Amnha, Alsoud, Asad, Magableh, & Riyadh, 2024; Awain, Asad, Sulaiman, Asif, & Shanfari, 2025). The questionnaire recommended to be used.

1.7.5 Data Collection Procedure and Analysis

Using the questionnaire as discussed earlier is considered appropriate for gathering standardized data from the owners and managers of SMEs operating in Qatar. To collect quantitative data on the relationship between EO, KM and Entrepreneurial performance of SMEs, a questionnaire was administered to a large number of participants. To facilitate the data collection process, the University Utara Malaysia provided a letter which was sent to owners and managers of small and medium-sized enterprises (SMEs) in Qatar, requesting permission to conduct the study.

To analyze the collected data, the study utilized a combination of inferential and descriptive statistics, with SPSS version 25.0 and PLS-SEM specifically employed for data interpretation (Asad & Ahmed, 2024). SEM is recognized as a powerful statistical tool in the social sciences because it can analyze multiple relationships simultaneously (Harrison, Henderson, Alderdice, & Quigley, 2019). The descriptive statistics method aided in outlining the characteristics of the sample being studied (Sekaran & Bougie, 2016). In the current study, both inferential and descriptive statistics were utilized for data analysis.

Conclusion

The study's goal is to investigate the worsening circumstances facing SMEs in Qatar. Since the government is giving special attention to the promotion of SMEs, yet there hasn't been much of an improvement, the goal is to propose a quantitative approach for evaluation. According to the reviewed literature on the entrepreneurial performance of SMEs, knowledge management and entrepreneurial orientation play a major role. At the same time, big data can help mitigate the effects of these factors on the entrepreneurial performance of SMEs in Qatar. Furthermore, given the nation's dynamic nature and the rapidly evolving state of technology, technological turbulence has been suggested as a moderator of the same relationship.

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References

- Abbas, J., & Khan, S. M. (2023). Green knowledge management and organizational green culture: An interaction for organizational green innovation and green performance. *Journal of Knowledge Management*, 27(7), 1852-1870. doi:<https://doi.org/10.1108/JKM-03-2022-0156>
- Abbas, J., Raza, S., Nurunnabi, M., Minai, M. S., & Bano, S. (2019). The impact of entrepreneurial business networks on firms' performance through a mediating role of dynamic capabilities. *Sustainability*, 11(11). doi:<https://doi.org/10.3390/su11113006>
- Abbas, M. W., & Hassan, M. U. (2017). Moderating impact of environmental turbulence on business innovation and business performance. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, 11(2), 576-596.
- Abbu, H. R., & Gopalakrishna, P. (2021). Synergistic effects of market orientation implementation and internalization on firm performance: Direct marketing service provider industry. *Journal of Business Research*, 125, 851-863. doi:<https://doi.org/10.1016/j.jbusres.2019.06.004>
- Abdelfadil, B. I., Thomas, R., Rees, D., & Suliman, A. (2023). Opportunities and challenges to the implementation of Value-Based Healthcare (VBHC) in SMES: The case of the state of Qatar. *Studies in Business and Economics*, 18(2), 5-23. doi:<https://doi.org/10.2478/sbe-2023-0021>
- Adel, H. M., Mahrous, A. A., & Hammad, R. (2020). Entrepreneurial marketing strategy, institutional environment, and business performance of SMEs in Egypt. *Journal of Entrepreneurship in Emerging Economies*, 12(5), 727-746. doi:<https://doi.org/10.1108/JEEE-11-2019-0171>
- Ahmad, M. A., & Al-Shbiel, S. O. (2019). The effect of accounting information system on organizational performance in Jordanian industrial SMEs: The mediating role of knowledge management. *International Journal of Business and Social Science*, 10(3), 99-104. doi:10.30845/ijbss.v10n3p9
- Al-Ali, N. M., Gorgenyi-Hegyes, E., & Fekete-Farkas, M. (2020). Perceived corporate sustainability practices and performance of small and medium enterprises (SMEs) in Qatar. *Polish Journal of Management Studies*, 22(1), 26-42. doi:10.17512/pjms.2020.22.1.02
- Albhirat, M. M., Zulkiffli, S. N., Salleh, H. S., & Zaki, N. A. (2023). A Study on strategic entrepreneurship orientations: Indicators, differential pathways, and multiple business sustainability outcomes. *International Journal of Sustainable Development & Planning*, 18(5).
- Albort-Morant, G., Leal-Rodriguez, A. L., & Marchi, V. D. (2018). Absorptive capacity and relationship learning mechanisms as complementary drivers of green innovation performance. *Journal of Knowledge Management*, 22(2), 432-452. doi:<https://doi.org/10.1108/JKM-07-2017-0310>

- Albream, F., & Maraqa, M. (2019). The impact of adopting e-collaboration tools on knowledge management processes. *Management Science Letters*, 9, 1009-1028. doi:10.5267/j.msl.2019.4.004
- Alenzi, M. A. (2023). The mediation of knowledge management on the relationship between HRM practices and employees' performance in Qatari hospitals. *Journal of Hunan University Natural Sciences*, 50(3). doi:https://doi.org/10.55463/issn.1674-2974.50.3.1
- Ali, M. A., Hussin, N., Haddad, H., Alkhodary, D., & Marei, A. (2021). Dynamic capabilities and their impact on intellectual capital and innovation performance. *Sustainability*, 13(18).
- Alkhuzaie, A. S., Asad, M., Mansour, A. Z., Sulaiman, M. A., Kayani, U. N., & Asif, M. U. (2024). Compliance with accounting standards by Jordanian SMEs. *Ikonomicheski Izsledvania*, 33(1), 89-107.
- Alshahrani, M. A., & Salam, M. A. (2023). Entrepreneurial orientation and SMEs performance in an emerging economy: the mediating role of absorptive capacity. *Journal of Research in Marketing and Entrepreneurship*, 26(1), 1-24. doi:https://doi.org/10.1108/JRME-07-2022-0090
- Alshanty, A. M., & Emeagwali, O. L. (2019). Market-sensing capability, knowledge creation and innovation: The moderating role of entrepreneurial-orientation. *Journal of Innovation & Knowledge*, 4(3), 171-178. doi:https://doi.org/10.1016/j.jik.2019.02.002
- Alzghoul, A., Elrehail, H., Emeagwali, O. L., & AlShboul, M. K. (2018). Knowledge management, workplace climate, creativity and performance: The role of authentic leadership. *Journal of Workplace Learning*. doi:10.1108/JWL-12-2017-0111
- Antunes, H. d., & Pinheiro, P. G. (2020). Linking knowledge management, organizational learning and memory. *Journal of Innovation & Knowledge*, 5(2), 140-149. doi:https://doi.org/10.1016/j.jik.2019.04.002
- Arias-Pérez, J., Velez-Ocampo, J., & Cepeda-Cardona, J. (2021). Strategic orientation toward digitalization to improve innovation capability: Why knowledge acquisition and exploitation through external embeddedness matter. *Journal of Knowledge Management*, 25(5), 1319-1335. doi:https://doi.org/10.1108/JKM-03-2020-0231
- Aribaba, F. O., Asaolu, T. O., & Olaopa, O. (2011). An evaluation of the impact of technological innovative entrepreneurial development programmes on the performance of small scale business in Nigeria. *Global Journal of Business, Management And Accounting*, 1(1), 001-009.
- Asad, M. (2024). Impact of environmental management on sustainable performance of Pakistani entrepreneurial firms: The mediating role of green product innovation and the moderating effect of transformational leadership. *Sustainability*, 16(24), 10935. doi:https://doi.org/10.3390/su162410935
- Asad, M. (2024). Synergetic impact of knowledge management and access to finance over open innovation for performance of SMEs. *International Journal of Economics and Business Research*, 28(3-4), 272-293. doi:https://doi.org/10.1504/IJEER.2024.141491
- Asad, M., & Ahmed, S. Y. (2024). Utilizing Biofertilizer for achieving sustainable agriculture and rural development strategy towards Vision 2040, Oman. *Sustainability*, 16(10), 4015. doi:https://doi.org/10.3390/su16104015
- Asad, M., & Kashif, M. (2021). Unveiling success factors for small and medium enterprises during COVID-19 pandemic. *Arab Journal of Basic and Applied Sciences*, 28(1), 187-194. doi:https://doi.org/10.1080/25765299.2020.1830514
- Asad, M., Aledeinat, M., Majali, T., Almajali, D. A., & Shrafat, F. D. (2024). Mediating role of green innovation and moderating role of resource acquisition with firm age between green entrepreneurial orientation and performance of entrepreneurial firms. *Cogent Business & Management*, 11(1), 2291850. doi:https://doi.org/10.1080/23311975.2023.2291850
- Asad, M., Asif, M. U., Bakar, L. J., & Altaf, N. (2021). Entrepreneurial orientation, big data analytics, and SMEs performance under the effects of environmental turbulence. *2021 International Conference*

- on *Data Analytics for Business and Industry (ICDABI)* (pp. 144-148). Zallaq: IEEE. doi:10.1109/ICDABI53623.2021.9655870
- Asad, M., Asif, M. U., Khan, A. A., Allam, Z., & Satar, M. S. (2022). Synergetic effect of entrepreneurial orientation and big data analytics for competitive advantage and SMEs performance. *2022 International Conference on Decision Aid Sciences and Applications (DASA)* (pp. 1192-1196). Chiangrai, Thailand: IEEE. doi:10.1109/DASA54658.2022.9765158
- Asad, M., Asif, M. U., Sulaiman, M. A., Satar, M. S., & Alarifi, G. (2023). Open innovation: The missing nexus between entrepreneurial orientation, total quality management, and performance of SMEs. *Journal of Innovation and Entrepreneurship*, 12(79), 1-13. doi:https://doi.org/10.1186/s13731-023-00335-7
- Asad, M., Fryan, L. H., & Shomo, M. I. (2025). Sustainable entrepreneurial intention among university students: Synergetic moderation of entrepreneurial fear and use of artificial intelligence in teaching. *Sustainability*, 17(1), 290. doi:https://doi.org/10.3390/su17010290
- Asad, M., Hafeez, M. H., Saleem, I., Asif, M. U., Sulaiman, M. A., & Awain, A. M. (2024). Product innovation: A mediator between entrepreneurial orientation, knowledge management, and performance of SMEs. *Journal of the Knowledge Economy*, 1-23. doi:https://doi.org/10.1007/s13132-024-02465-z
- Asad, M., Majali, T., Aledeinat, M., & Almajali, D. A. (2023). Green entrepreneurial orientation for enhancing SMEs financial and environmental performance: Synergetic moderation of green technology dynamism and knowledge transfer and integration. *Cogent Business & Management*, 10(3), 1-20. doi:https://doi.org/10.1080/23311975.2023.2278842
- Asad, M., Sulaiman, M. A., Awain, A. M., Alsoud, M., Allam, Z., & Asif, M. U. (2024). Green entrepreneurial leadership, and performance of entrepreneurial firms: Does green product innovation mediates? *Cogent Business & Management*, 11(1), 2355685. doi:https://doi.org/10.1080/23311975.2024.2355685
- Asif, M. U., & Bakar, L. J. (2025). Green strategic orientation and sustainable performance of SMEs: Moderating role of environmental turbulence. *Journal of the Knowledge Economy*. doi:https://doi.org/10.1007/s13132-025-02606-y
- Asif, M. U., Asad, M., Kashif, M., & Haq, A. U. (2021). Knowledge exploitation and knowledge exploration for sustainable performance of SMEs. *2021 Third International Sustainability and Resilience Conference: Climate Change* (pp. 29-34). Sakheer: IEEE. doi:10.1109/IEEECONF53624.2021.9668135
- Awain, A. M., Asad, M., Sulaiman, M. A., Asif, M. U., & Shanfari, K. S. (2025). Impact of supply chain risk management on product innovation performance of Omani SMEs: Synergetic moderation of technological turbulence and entrepreneurial networking. *Sustainability*, 17(7), 2903. doi:https://doi.org/10.3390/su17072903
- Awain, A. M., Sulaiman, M. A., Sheyadi, A. A., & Sukati, I. (2025). The role of digital supply chain management practices in the relationship between organizational culture and customer development. *Journal of Ecohumanism*, 4(1), 336–357. doi:https://doi.org/10.62754/joe.v4i1.5369
- Ayoub, H. F., Abdallah, A. B., & Suifan, T. S. (2017). The effect of supply chain integration on technical innovation in Jordan: The mediating role of knowledge management. *Benchmarking: An International Journal*, 24(3). doi:http://dx.doi.org/10.1108/BIJ-06-2016-0088
- Bag, S., C.Wood, L., Xu, L., Dhamija, P., & Kayikci, Y. (2020). Big data analytics as an operational excellence approach to enhance sustainable supply chain performance. *Resources, Conservation and Recycling*, 153. doi:https://doi.org/10.1016/j.resconrec.2019.104559
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social*

- Psychology*, 51(6), 1173-1182. doi:<http://dx.doi.org/10.1037/0022-3514.51.6.1173>
- Business Startups Qatar. (2020, 12 16). *Qatar's diversification is driven by SMEs*. Retrieved from Business Startups Qatar: <https://www.businessstartupqatar.com/news/qatars-diversification-driven-by-smes/>
#:~:text=More%20than%2096%20percent%20of,public%20projects%20in%20the%20future.
- Cappa, F., Oriani, R., Peruffo, E., & McCarthy, I. (2021). Big data for creating and capturing value in the digitalized environment: Unpacking the effects of volume, variety, and veracity on firm performance. *Journal of Product Innovation Management*, 38(1), 49-67. doi:10.1111/jpim.12545
- Castro, G. M.-d., López-Sáez, P., & Delgado-Verde, M. (2011). Towards a knowledge-based view of firm innovation. Theory and empirical research. *Journal of Knowledge Management*, 15(6), 871-874. doi:<https://doi.org/10.1108/13673271111179253>
- Cerchione, R., Esposito, E., & Spadaro, M. R. (2017). A literature review on knowledge management in SMEs. *Knowledge Management Research & Practice*, 14(2), 169-177. doi:<https://doi.org/10.1057/kmrp.2015.12>
- Chmura Kraemer, H., Kiernan, M., Essex, M., & Kupfer, D. J. (2008). How and why criteria defining moderators and mediators differ between the Baron & Kenny and MacArthur approaches. *Health Psychology*, 27(S2).
- Cooper, D. R., & Schindler, P. S. (2006). *Business Research Methods*. Chicago: McGraw-Hill Irwin.
- Creswell, J. W., & Creswell, J. D. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Chicago: SAGE Publications.
- Cuthbertson, R. W., & Furseth, P. I. (2022). Digital services and competitive advantage: Strengthening the links between RBV, KBV, and innovation. *Journal of Business Research*, 152, 168-176.
- Damer, N., Al-Znaimat, A. H., Asad, M., & Almansour, A. Z. (2021). Analysis of motivational factors that influence usage of Computer Assisted Audit Techniques (CAATs) auditors in Jordan. *Academy of Strategic Management Journal*, 20(Special Issue 2), 1-13.
- Desamparados, B., & Domenech, J. (2018). Big Data sources and methods for social and economic analyses. *Technological Forecasting and Social Change*, 130, 99-113. doi:<https://doi.org/10.1016/j.techfore.2017.07.027>
- Donnellan, J., & Rutledge, W. L. (2019). A case for resource-based view and competitive advantage in banking. *Managerial and Decision Economics*, 40(6), 728-737. doi:<https://doi.org/10.1002/mde.3041>
- Durst, S., Foli, S., & Edvardsson, I. R. (2024). A systematic literature review on knowledge management in SMEs: current trends and future directions. *Management Review Quarterly*, 74, 263-288. doi:<https://doi.org/10.1007/s11301-022-00299-0>
- Eva, N., Sendjaya, S., Prajogo, D., Cavanagh, A., & Robin, M. (2018). Creating strategic fit: Aligning servant leadership with organizational structure and strategy. *Personnel Review*, 47(1), 166-186.
- Fadhel, H. A., Aljalalma, A., Almuhanadi, M., Asad, M., & Sheikh, U. (2022). Management of higher education institutions in the GCC countries during the emergence of COVID-19: A review of opportunities, challenges, and a way forward. *The International Journal of Learning in Higher Education*, 29(1), 83-97. doi:<https://doi.org/10.18848/2327-7955/CGP/v29i01/83-97>
- Fernandez, R., & Ali, S. (2015). SME contributions for diversification and stability in emerging economies - an empirical study of the SME segment in the Qatar economy. *The Journal of Contemporary Issues in Business and Government*, 21(1), 23-45.
- Ferraris, A., Mazzoleni, A., Devalle, A., & Couturier, J. (2019). Big data analytics capabilities and knowledge management: Impact on firm performance. *Management Decision*, 57(8), 1923-1936. doi:<https://doi.org/10.1108/MD-07-2018-0825>

- Freixanet, J., Braojos, J., Rialp-Criado, A., & Rialp-Criado, J. (2021). Does international entrepreneurial orientation foster innovation performance? The mediating role of social media and open innovation. *The International Journal of Entrepreneurship and Innovation*, 22(1), 33-44. doi:https://doi.org/10.1177/1465750320922320
- Gueydi, S., & Haq, M. M. (2022). Assessing the Tax Incentives for Entrepreneurship and Innovation in Qatar. In M. M. Abdellatif, B. Tran-Nam, M. Ranga, & S. Hodžić, *Government Incentives for Innovation and Entrepreneurship: An International Experience* (pp. 257–271). Switzerland: Springer. doi:https://doi.org/10.1007/978-3-031-10119-9_12
- Hair, J. F. (2007). *Research Methods for Business*.
- Hair, J. F., Black, B., Babin, B., & Anderson, R. E. (2010). *Multivariate Data Analysis*. IVew Jersey: Pearson Education International.
- Hammami, S. M., Ahmed, F., Johny, J., & Sulaiman, M. A. (2021). Impact of knowledge capabilities on organisational performance in the private sector in Oman: An SEM approach using path analysis. *International Journal of Knowledge Management*, 17(1), 15-18. doi:10.4018/IJKM.2021010102
- Harms, R., Reschke, C. H., Kraus, S., & Fink, M. (2010). Antecedents of innovation and growth: Analysing the impact of entrepreneurial orientation and goal-oriented management. *International Journal of Technology Management*, 15(2), 135-152.
- Harrison, S., Henderson, J., Alderdice, F., & Quigley, M. A. (2019). Methods to increase response rates to a population-based maternity survey: A comparison of two pilot studies. *BMC Medical Research Methodology*, 19(1), 1-8.
- Hassen, T. B. (2021). The state of the knowledge-based economy in the Arab world: cases of Qatar and Lebanon. *EuroMed Journal of Business*, 16(2), 129-153. doi:https://doi.org/10.1108/EMJB-03-2020-0026
- Hock-Doepgen, M., Clauss, T., Kraus, S., & Cheng, C.-F. (2021). Knowledge management capabilities and organizational risk-taking for business model innovation in SMEs. *Journal of Business Research*, 130, 683-697. doi:https://doi.org/10.1016/j.jbusres.2019.12.001
- Jasra, J. M., Khan, D. M., Hunjra, A. I., Rehman, R. A., & Azam, R. -I. (2011). Determinants of success of small and medium enterprises. *International Journal of Business and Social Science*, 2(20), 274-280.
- Kanaan, O. A., Alsoud, M., Asad, M., Ta'Amnha, M. A., & Al-Qudah, S. (2024). A mediated moderated analysis of knowledge management and stakeholder relationships between open innovation and performance of entrepreneurial firms. *Uncertain Supply Chain Management*, 12(4), 2383-2398. doi:https://doi/10.5267/j.uscm.2024.5.028
- Khan, A. A., Asad, M., Khan, G. u., Asif, M. U., & Aftab, U. (2021). Sequential mediation of innovativeness and competitive advantage between resources for business model innovation and SMEs performance. *2021 International Conference on Decision Aid Sciences and Application (DASA)* (pp. 724-728). Sakheer: IEEE. doi:10.1109/DASA53625.2021.9682269
- Kreiser, P. M., Marino, L. D., Kuratko, D. F., & Weaver, K. M. (2013). Disaggregating entrepreneurial orientation: The non-linear impact of innovativeness, proactiveness and risk-taking on SME performance. *Small Business Economics*, 40(2), 273-291.
- Li, C., Ashraf, S. F., Shahzad, F., Bashir, I., Murad, M., Syed, N., & Riaz, M. (2020). Influence of knowledge management practices on entrepreneurial and organizational performance: A mediated-moderation model. *Frontiers in Psychology*, 11, 577106. doi:https://doi.org/10.3389/fpsyg.2020.577106
- Li, Y., Kwok, R. C.-W., Zhang, S., & Gao, S. (2020). How could firms benefit more from absorptive capacity under technological turbulence? The contingent effect of managerial mechanisms. *Asian Journal of Technology Innovation*, 28(1), 1-20. doi:https://doi.org/10.1080/19761597.2019.1686708

- Luthans, F., & Stewart, T. I. (1977). A general contingency theory of management. *Academy of Management Review*, 2(2), 181-195. doi:https://doi.org/10.5465/amr.1977.4409038
- Mangla, S. K., Raut, R., Narwane, V. S., Zhang, Z. (., & Priyadarshinee, P. (2020). Mediating effect of big data analytics on project performance of small and medium enterprises. *Journal of Enterprise Information Management*, 34(1), 168-198. doi:https://doi.org/10.1108/JEIM-12-2019-0394
- Mardani, A., Nikoosokhan, S., Moradi, M., & Doustar, M. (2018). The relationship between knowledge management and innovation performance. *The Journal of High Technology Management Research*, 29(1), 12-26. doi:https://doi.org/10.1016/j.hitech.2018.04.002
- Maroufkhani, P., Ismail, W. K., & Ghobakhloo, M. (2020). Big data analytics adoption model for small and medium enterprises. *Journal of Science and Technology Policy Management*, 11(4), 483-513. doi:https://doi.org/10.1108/JSTPM-02-2020-0018
- Martin, S. L., Javalgi, R. R., & Ciravegna, L. (2020). Marketing capabilities and international new venture performance: The mediation role of marketing communication and the moderation effect of technological turbulence. *Journal of Business Research*, 107, 25-37. doi:https://doi.org/10.1016/j.jbusres.2019.09.044
- Martínez-Costa, M., Jimenez-Jimenez, D., & Rabeh, H. A. (2019). The effect of organisational learning on interorganisational collaborations in innovation: An empirical study in SMEs. *Knowledge Management Research & Practice*, 17(2), 137-150. doi:https://doi.org/10.1080/14778238.2018.1538601
- McCarthy, D. J., Puffer, S. M., & Lamin, A. (2018). Entrepreneurial orientation in a hostile and turbulent environment: Risk and innovativeness among successful russian entrepreneurs. *European Journal of International Management*, 12(1-2), 191-221. doi:https://doi.org/10.1504/EJIM.2018.089033
- Mehrez, A. (2019). Investigating the effectiveness of practicing knowledge management in the hospitality industry: the case of Qatar. *International Journal of Knowledge Management Studies*, 10(2), 101-117. doi:https://doi.org/10.1504/IJKMS.2019.099119
- Menon, L. V. (2023). Gulf's migrant workers amidst Covid-19 and workforce nationalization: A focus on Qatar's social protection systems. In N. Kozhanov, K. Young, & J. Qanas, *GCC Hydrocarbon Economies and COVID 19* (pp. 414-172). Singapore, Singapore: Springer. doi:https://doi.org/10.1007/978-981-19-5462-7_7
- Noor, A.-A. M., Eva, G.-H., & Maria, F.-F. (2020). Perceived corporate sustainability practices and performance of small and medium enterprises (SMEs) in Qatar. *Polish Journal of Management Studies*, 22(1), 26-42. doi:10.17512/pjms.2020.22.1.02
- Ogbeibu, S., Emelifeonwu, J., Senadjki, A., Gaskin, J., & Kaivo-oja, J. (2020). Technological turbulence and greening of team creativity, product innovation, and human resource management: Implications for sustainability. *Journal of Cleaner Production*, 244, 118703. doi:https://doi.org/10.1016/j.jclepro.2019.118703
- Okour, M. K., Chong, C. W., & Asmawi, A. (2019). Antecedents and consequences of knowledge management systems usage in Jordanian banking sector. *Knowledge Process Management*, 26, 10-26.
- Ouakouak, M. L., AlBuloushi, N., Ouedraogo, N., & Sawalha, N. (2021). Knowledge sharing as a give-and-take practice: The role of the knowledge receiver in the knowledge-sharing process. *Journal of Knowledge Management*, 25(8), 2043-2066. doi:https://doi.org/10.1108/JKM-04-2020-0323
- Partanen, J., Kohtamäki, M., C.Patel, P., & Parida, V. (2020). Supply chain ambidexterity and manufacturing SME performance: The moderating roles of network capability and strategic information flow. *International Journal of Production Economics*, 221. doi:https://doi.org/10.1016/j.ijpe.2019.08.005

- Qatar Development Bank. (2016). *The State of Small and Medium Enterprises in Qatar 2016*. Doha: Qatar Development Bank.
- Qatar Development Bank. (2020). https://ossform.qdb.qa/en/Documents/SME%20DEFINITION%20FLYER_En.pdf. Doha: Qatar Development Bank.
- Quinlan, C., Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2018). *Business Research Methods* (2 ed.). London: Cengage Learning.
- Rashidirad, M., Salimian, H., & Soltani, E. (2018). A contingency view to novelty: The role of product-service strategy, sensing capability and environmental turbulence. *European Business Review*, 30(3), 218-245.
- Safari, A., Saleh, A. S., & Ismail, V. B. (2022). Enhancing the export activities of small and medium-sized enterprises in emerging markets. *Journal of Business & Industrial Marketing*, 37(5), 1150-1166. doi:<https://doi.org/10.1108/JBIM-08-2020-0388>
- Salvato, C., & Vassolo, R. (2018). The sources of dynamism in dynamic capabilities. *Strategic Management Journal*, 39(6), 1728-1752. doi: <https://doi.org/10.1002/smj.2703>
- Santos, V. d., Beuren, I. M., Bernd, D. C., & Fey, N. (2023). Use of management controls and product innovation in startups: Intervention of knowledge sharing and technological turbulence. *Journal of Knowledge Management*, 27(2), 264-284. doi:<https://doi.org/10.1108/JKM-08-2021-0629>
- Satar, M., Alharthi, S., Asad, M., Alenazy, A., & Asif, M. U. (2024). The moderating role of entrepreneurial networking between entrepreneurial alertness and the success of entrepreneurial firms. *Sustainability*, 16(11), 1-19. doi:<https://doi.org/10.3390/su16114535>
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & Sons.
- Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. *Journal of Knowledge Management*, 24(9), 2079-2106. doi:<https://doi.org/10.1108/JKM-11-2019-0624>
- Shehzad, M. U., Zhang, J., Latif, K. F., Jamil, K., & Waseel, A. H. (2023). Do green entrepreneurial orientation and green knowledge management matter in the pursuit of ambidextrous green innovation: A moderated mediation model. *Journal of Cleaner Production*, 388, 135971. doi:<https://doi.org/10.1016/j.jclepro.2023.135971>
- Sulaiman, M. A. (2025). Green product innovation as a mediator between green market orientation and sustainable performance of SMEs. *Sustainability*, 17(4), 1628. doi:<https://doi.org/10.3390/su17041628>
- Sulaiman, M. A., & Asad, M. (2023). Organizational learning, innovation, organizational structure and performance evidence from Oman. *Organizational Learning, Innovation, Organizational Structure and Performance Evidence from Oman* (pp. 1-17). Ljubljana: The International Society for Professional Innovation Management (ISPIM).
- Sulaiman, M. A., Asad, M., Awain, A. M., Asif, M. U., & Shanfari, K. S. (2024). Entrepreneurial marketing and performance: Contingent role of market turbulence. *Discover Sustainability*, 5, 1-20. doi:<https://doi.org/10.1007/s43621-024-00710-8>
- Ta'Amnha, M. A., Alsoud, M., Asad, M., Magableh, I. K., & Riyadh, H. A. (2024). Moderating role of technological turbulence between green product innovation, green process innovation and performance of SMEs. *Discover Sustainability*, 5, 1-16. doi:<https://doi.org/10.1007/s43621-024-00522-w>
- Ta'Amnha, M. A., Magableh, I. K., Asad, M., & Al-Qudah, S. (2023). Open innovation: The missing link between synergetic effect of entrepreneurial orientation and knowledge management over product

- innovation performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(4), 1-9. doi:<https://doi.org/10.1016/j.joitmc.2023.100147>
- Thani, S. K. (2022, July 19). *Business/Qatar Business*. Retrieved from The Peninsula: <https://thepeninsulaqatar.com/article/19/07/2022/smes-represent-97-of-qatari-private-sector-institutions>
- Wamba, S. F., Gunasekaran, A., Akter, S., Ji-fan, S., Dubeye, R. R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, 70, 356-365. doi:<https://doi.org/10.1016/j.jbusres.2016.08.009>
- Younis, H., & Elbanna, S. (2022). How do SMEs decide on international market entry? An empirical examination in the Middle East. *Journal of International Management*, 28(1). doi:<https://doi.org/10.1016/j.intman.2021.100902>
- Yuanzhu, Z., Tan, K. H., Li, Y., & Tse, Y. K. (2018). Unlocking the power of big data in new product development. *Annals of Operations Research*, 270(1), 577-595.
- Zellweger, T., & Sieger, P. (2012). Entrepreneurial orientation in long-lived family firms. *Small Business Economics*, 38(1), 67-84. doi:10.1007/s11187-010-9267-6
- Zhao, X., John G. Lynch, J., & Chen, Q. (2010). Reconsidering baron and kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206. doi:<https://doi.org/10.1086/651257>
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods*. Cengage Learning. South-Western: Erin Joyner.