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The Significance of Innovation Orientation in Firm Performance: Technological Capabilities as a Moderating Role

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Abstract

Entrepreneurial marketing "EM" is considered to be suitable for small businesses. However, innovation orientation "IO" as an EM dimension is a critical instrument that small and medium-sized businesses can use to obtain a competitive advantage. Thus, the general objective of this study is to explore and describe the significant relationship between IO and firm performance "FP" in SMEs in Khartoum-Sudan utilizing technological capabilities "TCPs" as a moderating variable. The resource-based view "RBV" provides the theoretical foundation for this study regarding the effect of innovation orientation on firm performance through technological capabilities. To achieve this objective, we assumed the following hypothesis: H1: Innovation orientation has a significant relationship with firm performance {profitability, sustainability, and customer satisfaction}. H2: We assume that TCPs can positively moderate the relationship between IO and FP. In this manner, our study is quantitative. Reliable with the purpose of this study. Furthermore, our study relied on the "Positivism philosophy", a deductive approach to theory development. Accordingly, overall, 255 responses were received in responding to our online questionnaire. To analyze the data firstly PCA, Correlation, and Rotation matrix were utilized to test the appropriateness of the study pre-model and check the validity of

the questionnaire measurements. secondly, we used Path analysis to examine the significant relationships between study variables. Consequently, the findings confirm both significant and insignificant relationships between IO and FP. Our analysis revealed significant relationships between innovation orientation, technological capabilities, and firm performance indicators such as profitability, sustainability, and customer satisfaction. Moreover, we found that technological capabilities play a crucial moderating role in enhancing the effects of innovation orientation strategy on firm performance. Anyhow, these results confirmed the partial support of the study's hypotheses.

Keywords: Entrepreneurial marketing, SMEs, Sustainability, AI, Customer satisfaction

Introduction

Innovation orientation, as a dimension of entrepreneurial marketing, plays a crucial role in shaping firm performance and technological capabilities, particularly within the context of small and medium-sized enterprises (SMEs) in Khartoum. SMEs in emerging economies face unique challenges and opportunities, requiring strategic approaches that integrate innovation, marketing, and technological advancement. Understanding how innovation orientation influences entrepreneurial marketing strategies and how these, in turn, impact firm performance with technological capabilities as a moderating factor, is essential for driving sustainable growth and competitiveness.

Entrepreneurial marketing emphasizes the proactive and innovative pursuit of opportunities to create value, capture markets, and achieve sustainable competitive advantage. Innovation orientation, as part of entrepreneurial marketing, focuses on cultivating a culture of creativity, experimentation, and adaptation within SMEs. This orientation not only involves product innovation but also extends to marketing strategies, processes, and organizational structures that support innovation-driven initiatives. Recent research has underscored the interconnectedness of innovation orientation, entrepreneurial marketing, firm performance, and technological capabilities. Rauch et al. (2009) have explored how entrepreneurial marketing practices, including innovation orientation, positively influence SME performance indicators such as market share, profitability, and growth.

Moreover, the moderating role of technological capabilities adds a dynamic dimension to this relationship. Technological capabilities encompass a firm's ability to leverage and deploy technological resources, knowledge, and infrastructure effectively. These capabilities can amplify or

dampen the impact of innovation-oriented entrepreneurial marketing strategies on firm performance, depending on their development and utilization within the organization. In the specific context of Khartoum SMEs, understanding how innovation orientation within entrepreneurial marketing frameworks contributes to enhanced firm performance, with technological capabilities shaping this relationship, is of paramount importance. By analyzing the interplay between innovation orientation, entrepreneurial marketing strategies, and technological capabilities, this research seeks to offer practical insights and strategic recommendations tailored to the unique challenges and opportunities faced by SMEs in Khartoum.

Through a combination of theoretical exploration and empirical analysis, this study aims to contribute to the advancement of knowledge in the fields of entrepreneurial marketing, innovation management, and SME performance within emerging market contexts. By bridging theory and practice, this research endeavors to provide actionable guidance for SME leaders, policymakers, and stakeholders seeking to foster innovation-driven growth and competitiveness in Khartoum's vibrant business environment.

2.0. Literature Review

2.1 Innovation Orientation and Entrepreneurial Marketing

Entrepreneurial marketing is considered to be suitable for small businesses. Furthermore, innovativeness is a critical instrument that small and medium-sized businesses can use to obtain a competitive edge (Hacioglu et al., 2012). To thrive, corporations need to be able to change and adapt. Companies operate under the awareness that eventually; rivals will enter the market with a product that fundamentally alters the nature of competition. Adaptation and change management skills are critical for survival. Can businesses, however, manage innovation? Yes, without a doubt, as Waples and Rushes stated in (2008).

Innovation orientation within the realm of entrepreneurial marketing has garnered significant attention in recent literature due to its profound impact on firm performance and competitive advantage. According to Hemmert et al. (2022), innovation orientation refers to a firm's strategic emphasis on fostering a culture of creativity, experimentation, and continuous improvement in products, processes, and marketing strategies. This orientation aligns closely with entrepreneurial marketing principles, which emphasize proactive market sensing, opportunity identification, and value creation (Hult et al., 2004).

Christopher Freeman (1982) stated in his well-known paper on the economics of innovation, "... not to innovate is to die." Undoubtedly, businesses that have become industry and technological leaders have

demonstrated the capacity to create innovative goods that are successful. The leading businesses have proven their ability to innovate in almost every field, from computers to pharmaceuticals to motor vehicles (see Table 1). Moreover, these same businesses are providing remarkable growth and/or return to their shareholders, according to The Boston Consulting Group's yearly study on the most inventive businesses in the world (P. Trott 2008).

Table 1. Market leaders in 2015

Industry	Market leaders	Innovative new products and services
Cell phones	Samsung; Apple	Design and new features
Internet-related industries	Google; Facebook	New services
Pharmaceuticals	Pfizer; GlaxoSmithKline	Impotence; ulcer treatment drug
Motorcars	Toyota; BMW	Car design and associated product developments
Computers and software development	Intel; IBM and Microsoft; SAP	Computer chip technology, computer hardware improvements and software development

Source: Trott, P. (2008).

Table 2. World's most innovative companies

2014 Rank	Company	Revenue growth 2012–13 % change	R&D spending 2012–13 % change
1	Apple	9.2	32.4
2	Google	19.2	17.1
3	Samsung	17.0	27.8
4	Microsoft	5.6	6.1 5
5	IBM	–4.6	–1.2
6	Amazon	21.9	43.8
7	Tesla Motors	387.2	–15.3
8	Toyota	–3.9	–6.9
9	Facebook	54.7	1.1
10	Sony	–5.7	–18.8

Source: Trott, (2008).

Innovation-oriented companies engage in creative processes and experimentation and strive for a constant flow of novel ideas that have the potential to lead to new products, services, and/or technologies that may be exploratory or maybe improvements of existing offers (Alqahtani & Uslay, 2020). An innovation orientation allows companies to turn recognized opportunities into ideas for innovation Sadiku-Dushi et al. (2019). In this study, we attempt to find out the best method that firms might follow to produce modernity for their process, services, product lines, supply channels, and packaging and how certain firms implement a new idea or a new technology to create a dynamic strategy and last to ensure competitive advantage.

2.2 Role of Technological Capabilities as a Moderator

Customers nowadays are choice seeking, demanding, and knowledgeable, and the power balance has changed from companies to value seeking customers in today's customer-centered hypercompetitive situations. consequence, controlling technological innovation capability for greater company performance through the fulfillment of consumer expectations is becoming increasingly important for all businesses. Only forward-thinking businesses that maximize consumer value by utilizing their technological capabilities efficiently will survive and prosper. Likewise, TCPs are part of the research approach which studies the capability concept, this approach analyzes how the capacity of a certain enterprise will promote the use of resources in the functional sector of a certain organization. On the other hand, the competitive advantage of the company therefore would depend on the capability of the company.

Technological capabilities play a pivotal role in moderating the relationship between innovation orientation and firm performance within the context of entrepreneurial marketing. Teece (2018) defines technological capabilities as a firm's ability to leverage and deploy technological resources, knowledge, and infrastructure effectively to create value and sustain competitive advantage.

Recent research Borodako, et al. (2023) has emphasized the moderating role of technological capabilities in enhancing the impact of innovation-oriented entrepreneurial marketing strategies on firm performance metrics such as product innovation success and market responsiveness. They argue that firms with strong technological capabilities can more effectively translate innovative ideas into marketable products or services, leading to superior performance outcomes. The technological capability of a company is high if more technological advances than other companies in service have traditionally been produced. The technology capabilities of a firm are founded on what the firm has done well in the past and will likely keep the firm on the effective road. In addition, strong technical capabilities will make the business look more inward rendering the company's external information less important (Ferna and Garcı, 2012). In this context the following hypothesis has been settled: *H2: We assume that TCPs can positively moderate the relationship between innovation orientation IO and firm performance FP*.

The commonly thought view of technological capability proposes that firms with strong technological capability can rapidly identify technological opportunities and the value of technological resources, obtain the resource and benefit from it, thus success in product innovation. (Wu, 2014; Zhou & Wu, 2010; Srivastava et al. 2015; Blomkvist et al. 2017). The classification of the capability depends on its purpose. Technological

capabilities are a core element of information usage and technology as an innovation requirement in the enterprise, Technological capability is the ability to make effective use of technological knowledge in production, engineering, and innovation Srivastava et al. (2015). By these means capabilities are defined as "a firm's capacity to deploy resources, using organizational processes, to affect a desired end" Haeussler, et al. (2012).

2.3 Empirical Evidence from Firms Performance in Emerging Economies

This part discusses the second concept of this study firm performance which represents the dependent variable, including the concept, the definitions, and the dimensions of firm performance. The firm's internal environment is highlighted as a source of competitive advantage by the resource-based view of the firm (RBV), which also highlights the resources that businesses have built up to compete in the marketplace (Wang, 2014).

The framework of RBV states that the resources forming the bases of one's competitive advantage should be valuable, rare, imperfectly imitable, and sustainable (Madhani, 2010). Argues that it is important that the firm evaluate the contribution to competitive advantage of specific resources/activities when considering them for outsourcing with the application of RBV in the development of 24 competitive advantage, through either the cost leadership strategy or the differentiation strategy, the nature of the organization as a whole and/or the design of the firm's products and/or services are essential components. Cost leadership is typically achieved through the development of both highly effective and efficiency organization and production processes. Differentiation can be achieved through either the development of a superior organization or through the design of superior products and/or services. Moreover, the RBV suggests that organizations should deploy assets and resources both internally and externally to create competitive advantage. Logically, the firm would then perform in house only those activities for which it has demonstrated superior performance in comparison to competitors. By outsourcing those tasks that can best be performed by organizations that specialize in that work, the firm may better focus their value-creating activities on core tasks, therefore maximizing their effectiveness.

The concept of firm performance needs to be distinguished from the broader construct of organizational effectiveness. FP is an important construct in strategic management research all around the world, and it is regularly employed as a dependent variable. Despite its importance, there is little agreement on its description, dimensionality, or measurement, which limits advances in research. Successful businesses are essential for developing countries. many economists compare them to an engine in terms

of determining their economic, social, and political development. Empirical studies focusing on SMEs in emerging economies consistently show a positive correlation between innovation orientation and firm performance Isichei et al. (2020

SMEs with a strong focus on innovation tend to outperform their peers in terms of market growth and profitability. However, the degree to which innovation orientation translates into tangible performance outcomes may vary depending on contextual factors such as industry dynamics, market conditions, and regulatory environments (Damanpour & Aravind, 2012).

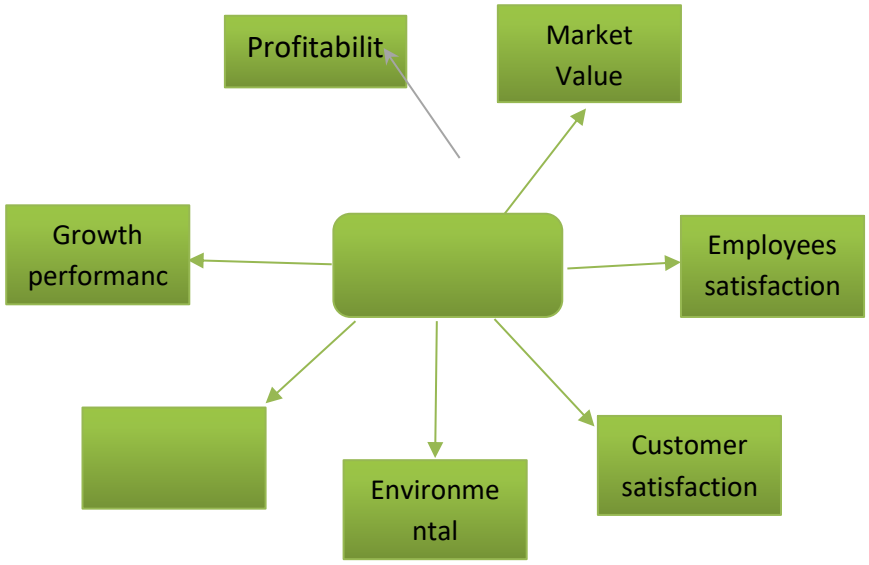
Ayyagari et al. (2011) conducted a longitudinal study across multiple industries in emerging economies, highlighting the long-term benefits of sustained innovation orientation on SME performance metrics such as return on investment, market share, and customer satisfaction. These findings underscore the strategic importance of fostering innovation capabilities within SMEs operating in dynamic and competitive markets. Consequently, integrating innovation orientation into entrepreneurial marketing strategies is crucial for SMEs to thrive in competitive markets. The role of technological capabilities as a moderator further underscores the importance of leveraging technology for sustained innovation and business success. By fostering a culture of innovation, investing in relevant technologies, and aligning strategic orientations with market demands, SMEs can enhance their competitive positions and achieve long-term growth objectives. That lead to the following hypothesis:

H1: Innovation orientation has a significant relationship with firm performance in terms of {profitability, sustainability, and customer satisfaction}.

2.3.1 Dimensions of (FP)

A multidimensional or unidimensional comprehensive construct (model) on firm performance is possible. The list of identified determinants is shown in Figure 2., i.e., possible representations of firm performance. It is to be noted that the identified determining factors for firm performance are *profitability performance,* growth performance, market value performance, *customers‟ satisfaction*, employees‟ satisfaction, environmental performance, environmental audit performance, corporate governance performance and social performance. As pointed out earlier, these determinants were identified, based on the reviews published earlier (Santos, & Brito, 2012).

Figure 1. List of identified dimensional for firm performance



Source: Selvam, et, al. (2016).

Based on the above-mentioned dimensions, and according to the recommendations of the participants in the qualitative phase of this study and for an (*explicit reason*), the profitability of the firm, sustainability, and customer satisfaction are selected as a core measurement of a FP to be applied in Sudanese SMEs Thus, our study comes up with Mendonca, & Zhou, (2019) for the adoption of profitability and customer satisfaction, and with Gupta, & Gupta, (2020) in terms of sustainability and profits.

2.3.1.1 Profitability

Profitability performance refers to a company's ability to make money. After paying all expenses directly linked to the generating of revenue, such as producing a product, and other expenses associated with the conduct of company activities, a profit is what is left of the revenue a business generates (Selvam et al., 2016). An enterprise makes profitability by selling products or services at a lower cost than its competitors, or by selling differentiated items at a premium price that covers the extra cost of differentiation. Firm profitability reflects the financial performance of SMEs. profit will be reinvested in innovative product and service technologies, loyalty programs improved, and customer satisfaction enhanced (Kumar et al., 2009).

An enterprise makes profitability by selling products or services at a lower cost than its competitors, or by selling differentiated items at a premium price that covers the extra cost of differentiation. Therefore, the

objective of the firm is to maximize the wealth of the existing shareholders. Meanwhile, there are several ways of measuring profits, from direct measures as reported on financial statements to the financial ratios normally used in the finance literature (e.g., return on assets, return on sales, return on investment, etc.). These latter areas are less commonly used, which is typically a function of the availability of data, but they do occasionally appear in the literature (Josh Siepel & Marcus Dejardin, 2020).

2.3.1.2 Sustainability

Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Marcuse, 1998). There are two mechanisms because firms take action towards more sustainability. First, certain external influences such as mandatory legislation may impose pressure upon a firm to kick off sustainability initiatives to prevent disadvantages or penalties. Second, firms see a potential competitive advantage in the realization of sustainability initiatives leading to a voluntary pursuit of sustainability efforts. The generation of new markets for sustainable products, or cost savings realized through reduced resource consumption within the manufacturing process are both examples of opportunities that arise in the context of the sustainability challenge, which can be used to gain a competitive advantage (Schrettle et al., 2014).

2.3.1.3 Presumed Customers satisfaction PCS.

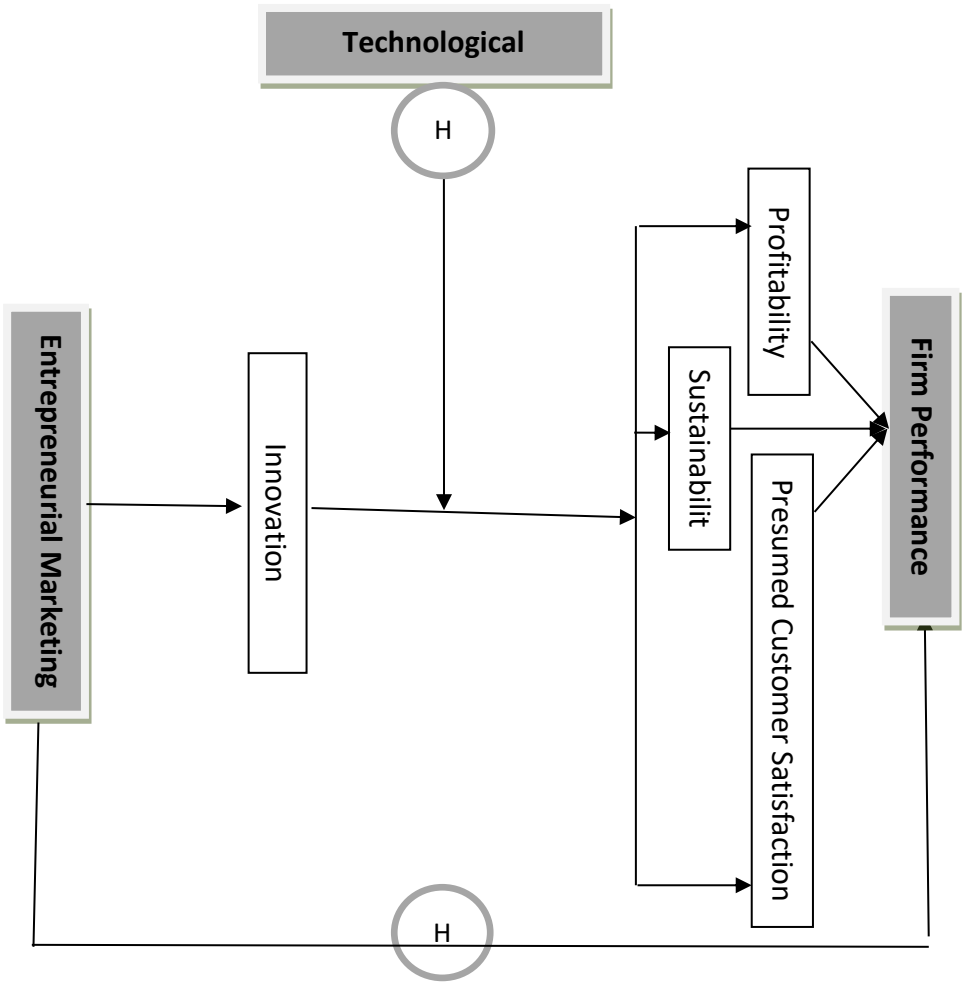
Customer satisfaction provides a leading indicator of consumer purchase intentions and loyalty. “Customer and employee satisfaction are two more factors to consider at every circumstance. Customers expect businesses to deliver goods and services that meet their needs. The customer is the central focus for business improvement. In a competitive environment, businesses must understand their customers' needs in order to eliminate mistakes and increase the perceived quality of their services. They must also add value to their offers. Customer satisfaction increases willingness to pay, and a company's value is created in the process” (Selvam et al., 2016).

The customer's or client’s emotional response, combining his/her experiences and feelings after consumption of a product or service, with the expectations and perceived value (Biesok & Wyród-Wróbel, 2011). Thus, all human needs and wants are certain things; this is one of the foundations of marketing. After fulfilling these needs customers expect to be satisfied with their purchase. According to Kura, (2019) satisfaction is when the customer evaluates whether a product or service has met their needs and expectations.

2.4 The conceptual framework of the study

Figure (2) presents the conceptual framework for this study which proposes the links of innovation orientation as dimension of entrepreneurial marketing and firm performance, the theoretical approach of this study proposes that technological capabilities moderate the relationship between innovation orientation and firm performance.

Figure 2. Conceptual framework



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3 Research Methodology

3.1 General research design

3.1.1 Quantitative approach

The objective of the quantitative phase is to examine the relationship between innovation orientation IO perceptions and firm performance FP in Sudanese SMEs. by testing technological capabilities as a moderating

variable. In this manner, our study is quantitative. Reliable with the purpose of this study, the study relied on the *"Positivism philosophy"*, *deductive approach* to theory development, quantitative methodological choice, survey strategy, and cross-sectional Time horizon and using a personally administered questionnaire. A cross-sectional description survey research design will be adopted for this study. Cross-sectional is cost and time-effective because data can be gathered just once perhaps over days weeks or months to answer research questions (Hamad, 2019, Sekaran, 2003). In addition to that, a cross-sectional survey design will be conducted to assess the moderating effect of technological capabilities on the relationship between innovation orientation and firm performance in Sudanese SMEs.

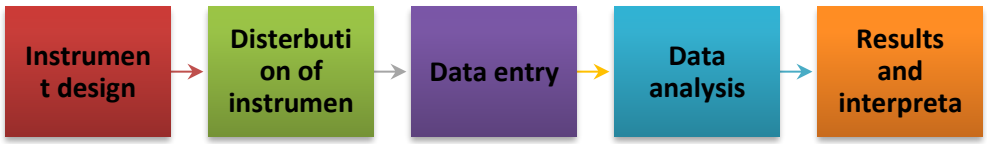
3.1.2 Population and sampling

The sample frame of this study defined SME firms in Sudan, which includes various sectors such as (Services, industrial...etc.) which were selected since they have great contributions to the Sudan economy in terms of their contributions to output employment. By saying "In an enabling environment, SMEs have a high potential for creating employment and innovation. They can also contribute to reduce poverty and to empower the poor so that they can realize their productive capacities and integration into society". The respondent approached should be the most informed and knowledgeable person about the issue of interest in that firm (Hamad, 2019, sekeran, 2003). Consequently, the appropriate persons who were being asked to fill out the questionnaire were ideally managers at the top management levels, employees, and entrepreneurs. Those participants have a good perception of their firm's business strategy as well as they have their methodologies and techniques to be used in environmental scanning and information generating regarding their firms.

3.1.3 Data collection instruments, process, and sample-size

Since our study population is unknown or considered to be fairly large, which makes it difficult to determine the size of the study sample, we therefore resorted to calculating it according to the Cochrane equation, On the other hand, there are computer programs for calculating sample size based on the same Cochrane equation N =, such as www.calculator.net program. This calculator computes the minimum number of necessary samples to meet the desired statistical constraints. Thus, the Sample size for this study is: "285" This means 285 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value.

Figure 3 shows the process of collecting the data using an online questionnaire.



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Data Analysis

4.0 Quantitative methodology

4.1. Data cleaning

Data cleaning deals with detecting and removing errors and inconsistencies from data to improve the quality of data. The need for data cleaning is centered on improving the quality of data to make them “fit for use” by users by reducing errors in the data and improving their documentation and presentation (Chapman, 2005). Data quality problems are present in single data collections due to misspellings during data entry, missing information, or other invalid data. When multiple data sources need to be integrated, or analysis programs need to be used, the need for data cleaning increases significantly. Thus, in this study data cleaning is used to manipulate missing data, unengaged responses, and outliers.

4.2. Missing Data

Missing data is common and always expected in the process of collecting and entering data due to lack of concentration and/or misunderstanding among respondents, and missing information or other invalid data during the entry of data. Missing data can cause several problems.

The most apparent problem is that there simply won't be enough data points to run the analysis, particularly in the structural equation model (SEM). Both exploratory and confirmatory factor analysis and path models require a certain number of data points to compute estimates. Additionally, missing data might represent bias issues. Some people may not have answered particular questions in the survey because of some common issue. If missing data is more than 10% of the responses on a particular variable, or from a particular 65 respondents, that variable or respondent may be problematic Hamad. (2019). In this study the proportion of missing data is lower than 10%. Therefore, there is no need to remove any of the responses.

4.3. Unengaged responses

Unengaged responses mean some responses give the same answer for all the questionnaires it seems to be random answers, in this case, we use standard deviation to find out any unengaged response, this means that any standard deviation of responses less than 0.5 when Likert‟ 's five-point scale is used just deleted. Therefore, in this study, 7 questionnaires were found to have a standard deviation of less than 0.5 and they were excluded from data analysis, table (3) shows the unengaged response.

Table 3. Unengaged responses

Total Questionnaires	255
Unengaged responses	9
Unengaged responses Rate	3%

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4.4. Outliers

It is very important to check outliers in the dataset. Outliers can influence the results of the analysis. If there is a high sample size, the need for removing the outliers is wanted. If the analysis runs with a smaller dataset, you may want to be less liberal about deleting records However, outliers will influence smaller datasets more than the largest ones. However, after checking outliers the results of the dataset show that no outliers, everything in the dataset is logical and acceptable.

4.5. SMEs and respondent’s frequencies

Based on the descriptive statistics using the frequency analysis this part clarifies the presence of respondents who participated in the survey in the light of six characteristics.

Table 4. Presents frequencies and percentages of SMEs and respondents

Firm characteristics		Frequencies	Percentage
Age	Less than 21	48	18.8%
	21 to 30	76	29.8%
	31 to 40	74	29.0%
	More than 40	57	22.4%
Gender	Male	139	54.5%
	Female	116	45.5%
Qualifications	Primary school	21	8.2%
	Secondary school	64	25.1%
	Undergraduate	100	39.2%
	Postgraduate	70	27.5%
Position	An entrepreneur /business owner	70	27.5%
	Manager	68	26.7%
	Employee	117	45.9%
Firm size	Small firm (1 to 5 employees)	108	42.4%
	Medium firm (6 to 49	147	57.6%

	employees)		
Sector	Services	149	58.4%
	Industrial	106	41.6%
Total		**255**	**100%**

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4.6. Reliability of Scales Using Cronbach's Alfa

The analysis of reliability using Cronbach's Alpha indicates satisfactory internal consistency for the scales utilized in the study, as recommended by Hair et al. (2019). An acceptable level of reliability is achieved when Cronbach's alpha exceeds 0.50. Specifically, the Entrepreneurial Marketing scale, comprising 14 items, demonstrates a Cronbach's Alpha of 0.731, indicating good reliability. The Technological Capabilities scale, which consists of 6 items, shows a slightly lower but still acceptable Cronbach's Alpha of 0.538. Similarly, the Firm Performance scale, comprising 9 items, exhibits a Cronbach's Alpha of 0.615, suggesting moderate internal consistency.

Overall, the combined scales, consisting of 28 items, yield a Cronbach's Alpha of 0.815, indicating strong reliability across the comprehensive set of measures used in the study.

Table 5. Reliability of scales using Cronbach's Alfa

Variable	Number of items	Cronbach's Alfa
Entrepreneurial marketing	14	0.731
Technological capabilities	6	0.538
Firm Performance	9	0.615
Overall	28	0.815

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4.7. Path analysis

The research utilized path analysis with AMOS v26 to examine the proposed model and validate the hypotheses. Structural Equation Modeling (SEM) path analysis is a powerful statistical technique used in various fields, due to its ability to model complex relationships among multiple variables. Unlike simpler methods like regression analysis, SEM allows for the simultaneous estimation of multiple relationships, including those involving latent variables, while also correcting for measurement error in observed variables (Hair et al., 2019). The study aimed to explore the intricate relationships between innovation orientation, tech capabilities, and key organizational outcomes such as profitability, sustainability, and presumed customer satisfaction.

The results presented in table 6 indicate that innovation orientation significantly influences sustainability and customer satisfaction, with a positive (β =0.116, p = 0.024) and (β =0.284, p = 0.000) respectively,

supporting H1:2 and H1:3. However, innovation orientation, do not significantly influence profitability, as indicated by (β = -0.072, p = 0.205) as indicated by rejected hypotheses H1:1.

Table 6. Path analysis

No. of hypothesis	Path analysis	Estimate	P	Results
H1:1	Innovation orientation → Profitability	-0.072	0.205	Rejected
H1:2	Innovation orientation → Sustainability	0.116	0.024	Accepted
H1:3	Innovation orientation → Customer satisfaction	0.284	0.000	Accepted

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In testing the moderation effect of technological capabilities on the relationship between innovation orientation and firm performance, interaction effects were employed. This approach allowed for a clearer examination of how technological capabilities influence the strength or direction of the relationship between innovation orientation efforts and firm performance outcomes.

The results presented in table 28 suggest that the technological capabilities positively moderate the relationship between innovation orientation and sustainability (β =0.175, p = 0.000) similarly technological capabilities positively moderate the relationship between innovation orientation and customer satisfaction (β =0.315, p = 0.000) supporting H4:2, and H4:3. However, technological capabilities had no significant moderating effect on the relationship between innovation orientation and profitability (β = -0.07, p = 0.208), leading to rejection H4:1.

Table 7. Path analysis of moderation effect (TCPs)

No. of hypothesis	Path	Estimate	P	Results
H2:1	Int. (Innovation orientation x Technological capabilities) → Profitability	-0.07	0.208	Rejected
H2:2	Int. (Innovation orientation x Technological capabilities) → Sustainability	0.175	0.000	Accepted
H2:3	Int. (Innovation orientation x Technological capabilities) → Customer satisfaction	0.315	0.000	Accepted

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5.0. Discussions and Conclusion

5.1. Innovation orientation and firm performance:

Innovation orientation was found to have a direct positive impact on firm performance. Therefore, confirming that the results of path analysis showed that innovation orientation has positive effect on (sustainability and

presumed customer satisfaction), accepting both hypothesis *H1:2, H1:3* nonetheless it has negative impact on (profitability) rejecting hypothesis *H1:1* where ($p>0.05$). Similarly, several studies have suggested that there can be a negative relationship between innovation orientation and short-term profitability for instance, research by Hult et al. (2004) found that firms emphasizing innovation may initially experience lower profitability due to the high costs associated with research and development (R&D) and uncertain returns on investment. On the other hand, the positive association between innovation orientation and sustainability has been documented in various studies. Prahalad & Hammond (2002) emphasized the role of innovation in driving sustainable business practices, such as the development of eco-friendly products and processes. Moreover, studies by Christmann & Taylor (2006) and Hart (1995) have highlighted how firms that prioritize innovation can achieve competitive advantages by integrating sustainability into their business strategies.

Additionally, the positive impact of innovation orientation on customer satisfaction is well-supported in the literature. Numerous studies have highlighted the importance of continuous innovation in meeting evolving customer needs and preferences (Danneels, 2002; Narver & Slater, 1990). For instance, firms that innovate in product design, service delivery, or customer engagement methods are often better positioned to enhance customer satisfaction and loyalty (Lichtenthaler, 2011). However, these significant findings have a strong association with the ***qualitative findings*** in which the participants have clarified that Innovation orientation is crucial for SMEs in Sudan and is more likely to be incorporated into the EM. Nonetheless, it is beneficial for new ventures to create innovation, and it is particularly valuable to adopt EM as a strategic posture. (Bachmann, et, al. 2021; R. Jones, J. Rowley 2011). Innovation orientation is also recognized as an important success factor for new ventures Seo, (2020). In conclusion, the findings of our analysis align with previous research, emphasizing the complex and multifaceted nature of the relationship between innovation orientation and various business outcomes. While innovation may initially impact profitability negatively, its positive effects on sustainability and customer satisfaction can contribute to long-term organizational success and competitiveness.

Conclusion

In conclusion, this study has explored the dynamics of innovation orientation and its impact on firm performance within the context of Sudanese SMEs. Through comprehensive data analysis and discussion, several key findings have emerged. Our analysis revealed significant relationships between the dimensions of entrepreneurial marketing IO,

technological capabilities, and firm performance's indicators such as profitability, sustainability, and customer satisfaction. Notably, we found that technological capabilities play a crucial moderating role in enhancing the effects of innovation orientation strategies on firm performance, underscoring the importance of integrating technology-driven approaches into marketing initiatives for SMEs in Sudan.

Furthermore, the study highlighted the importance of contextual factors, such as the unique socio-economic landscape of Sudanese SMEs, in shaping the effectiveness of innovation orientation practices. By addressing these contextual dimensions and leveraging technological resources effectively, entrepreneurs, owners, and managers can develop tailored strategies to enhance organizational performance and gain a competitive advantage in the market. Furthermore, our analysis explained the complex relationship between the study variables and dimensions/components of entrepreneurial marketing, revealing how each component interacts with technological capabilities to influence firm performance. Specifically, we found that certain dimensions of entrepreneurial marketing, such as networking and innovation orientation, exhibit varying degrees of dependence on technological capabilities, underscoring the importance of aligning technological investments with specific marketing strategies to maximize their impact on organizational outcomes.

Moreover, our findings underline the pivotal role of technological capabilities as a moderator for enhancing the effectiveness of innovation orientation practices, serving as a cornerstone for innovation-driven growth and sustainable competitive advantage in Sudanese SMEs. Overall, this study contributes to the growing body of literature on entrepreneurial marketing and provides valuable insights for practitioners, policymakers, and academics seeking to understand and support the development of SMEs in Sudan and similar emerging market contexts.

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Authorship

1st author, Conceptualization, Data curation, Formal Analysis, Investigation, Visualization, Methodology, Writing – Original Draft, Writing – Review & Editing.

2nd author, Methodology, Writing – Original Draft, Writing – Review & Conceptualization, Supervision.

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