

UNIVERSITY OF PANNONIA

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The Moderating Role of Technological Capabilities in the Relationship Between Entrepreneurial Marketing and Firm Performance in SMEs-Khartoum Sudan.

Doctoral (PH. D.) Dissertation

THESIS BOOKLET

Author:

Alfateh Ahmed Ali Fegada

Supervisor:

Prof. Dr. Zoltán VERES

Veszprem

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A quick overview to background of the study

Small and Medium Sized Enterprises (SMEs) are more sensitive to changes in the environment than larger businesses. They have fewer resources to face economic downturns, but they also have a special flexibility in the way they operate, allowing them to take swift decisions when these are needed. They also have inner characteristics, such as management style, affecting how their operations are run, which is significantly different from how larger companies run their businesses.

A particularly interesting strand of academic literature on SMEs has been developing in the interface between marketing and entrepreneurship. While considering the unique nature of SMEs, researchers have been actively trying to understand how these characteristics relate to SME marketing practices. Entrepreneurial marketing is therefore a subject of increasing academic interest, particularly as opposed to marketing practices in larger businesses (Cacciolatti & Lee, 2015). Entrepreneurial marketing “EM” is a dynamic and progressing field at the intersection of entrepreneurship and marketing. It represents a mindset, approach, and set of strategies that are distinct from traditional marketing practices.

This emerging concept is vital for startups, small businesses, and innovative ventures seeking to navigate the complex and highly competitive business landscape of the 21st century. Thus, considering the great development in technology in the existing era, innovative processes in addition to the role of marketing to meet the needs and desires of consumers, entirely organizations have become required to look ahead and develop long-term strategies, one of these strategies can be realized by implementing entrepreneurial marketing by which I assume it allows to accomplish sustainable competitiveness and gain profits for SMEs in Khartoum-Sudan.

As a concept entrepreneurial marketing was launched in 1982, and many researchers tried to describe this concept. (Morris et al., 2001; Becherer et al., 2012; Westerlund & Leminen, 2018; Whalen et al., 2016). Meanwhile, the word is also associated with marketing activities in small businesses with limited capital and who need to rely on innovative and unsophisticated tactics. Additionally, EM can be seen as a modern paradigm that integrates crucial aspects of marketing and entrepreneurship into an integrated concept in which marketing is a business-based operation. Though, in the present business environment, with growing dynamics, conditions, and

competitions, entrepreneurs and managers must skip traditional management principles and replace them with original innovative thoughts and procedures, this is considered a promising and growing research field at the intersection of the two most important areas of business administration. In the same scope many scholars have been involved in entrepreneurial marketing has a positive effect on performance. (E.g., Becherer et al., 2012 ; Sadiku-Dushi et al., 2019; Hacioglu et al., 2012 ; Hamali et al., 2016).

The expected outcome of the research is to contribute academically to fill the gap in the literature providing a first study that connect entrepreneurial marketing with the firm performance via technological capabilities in SMEs in Sudan. Moreover, this study will fill the gap similarly in the literature given that there is still a scarcity of quantitative and qualitative studies. The findings will also help managerially the policymakers who are concerned about small and medium-sized enterprises within the country and can thus use the results of a study to formulate better strategies to support these enterprises. Finally, company owners can consequently benefit from the research outcomes by getting to know and considering the ideas incorporated of entrepreneurial marketing in this study. My study could, lastly, increase the interest in further developing the field of EM of other academics and researchers.

Statement of the problem

In Sudan, governments are facing enormous economic slowdowns and unemployment problems. In addition, the forces of globalization and technological advancements are putting pressure and demands on the rate of enhancement in social and economic development. In such situations entrepreneurship is thought of as the main accelerator of economic development, using job creation, utilization of resources, improved production through innovation, value creation, and wealth accumulation. However, due to the challenges that face the success of entrepreneurship (finance, management of business, policies, etc.), there is a pressing need to adopt a holistic approach to this phenomenon to generate high levels of dynamism, innovation, effectiveness, and introduce policies, programs, and initiatives that foster entrepreneurship development (Khattab et al., 2019). Likewise, business organizations in Sudan are challenged with intense competition in this manner making the survival and growth of any business dependent on their ability to offer superior value to customers (Osman et al., 2018). Likewise, there were a few studies conducted in the field of entrepreneurial marketing in SDN. Thus, this study attempts to address the gaps and limitations in the literature to formulate a problem statement.

Due to a lack of interdisciplinary research, EM still has much to learn. The current state of EM knowledge needs to be improved. Rather than investigating how marketing practices function in the real world, research has become mired in its theory (Holmes & Jorlöv, 2015). Thereby, I found that there is a gap and deficiency in the field of entrepreneurial marketing specifically in SMEs operate in Sudan. The insufficiency is that there is not much experimental research about EM. Moreover, there is a little or nothing well-known about the EM dimensions and their impact on the firm performance of SMEs in Sudan. The gaps in the literature are considerable; additionally, there is still no commonly accepted definition of EM, or EM dimensions and practices (Nora Sadiku-Dushi et al., 2019). Particularly in small and medium-sized enterprises, despite the scientific and practical importance of the entrepreneurial marketing field.

Also, the moderating role of technological capabilities on the relationship between entrepreneurial marketing and firm performance is important because the characteristics of this kind of capabilities (that promote improvement and innovation) can enhance the positive effect of entrepreneurial marketing and firm performance. However, there is previous research examines only the direct impact of technological capabilities on firm or marketing performance. (e.g., Camisón, & Villar-López 2014; Tzokas et al., 2015). Consequently, this study shows the need for a complementary interaction between (entrepreneurial marketing and firm performance) which has been developed by technological capabilities as a moderator variable.

Hence, this study attempts to address the above-mentioned research gaps and limitations in the existing entrepreneurial marketing literature. Moreover, I have addressed this gap by presenting scientific solutions and practical contributions with systematic foundations to help enterprises reach out the desired goal. On the other hand, the existence of contemporary TCPs indicates the importance of the TCPs that SM firms are supposed to implement in Sudan to gain the desired achievement by applying an entrepreneurial marketing strategy. Thus, this research addresses the gaps and limitations in the literature by investigating the link between entrepreneurial marketing, firm performance, and technological capabilities. Generally, this research investigates the moderating effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance in the SME sector in Sudan.

Research Questions

RQ1: Does technological capabilities plays a moderating role in the relationship between entrepreneurial marketing and firm performance? *Following this focal question, I also attempt to find out answers to the subsequent questions:*

RQ1:1 What is the extent level of understanding entrepreneurial marketing paradigm in Sudanese SMEs?

RQ1:2 What is the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs?

RQ1:3 What are the benefits of employing technological capabilities in Sudanese SMEs?

Research Objectives

The general objective of this study is: To explore and describe the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs by utilizing technological capabilities as a moderating variable.

1. This study also intends to explain the extent level of understanding and implementing entrepreneurial marketing (EM) paradigm as a strategy in Sudanese SMEs. by employing experimental-qualitative approach.
2. This study aims to find out the benefits of utilizing technological capabilities (TCPs) as moderator between EM and FP in Sudanese SMEs.

Definition of key terms

The definitions of the key variables are detailed as follows:

Entrepreneurial Marketing (EM) is a concept that emerged at the intersection of entrepreneurship and marketing, aiming to provide a new approach to marketing practices. (Hanin et al., 2022; Shanmugan et al. 2023; Ranhua, 2022). This innovative marketing approach integrates elements of both marketing and entrepreneurial management, enhancing adaptability to the dynamic market environment and enabling companies to seize new opportunities effectively. Nuning, Kristiani (2023). The evolution of EM has been rapid, with scholars holding varying views on its definition, emphasizing its significance for the development of small and medium enterprises (SMEs). Nevertheless, the main focused concept of EM indicated as proactive identification and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to the risk management, resource leveraging and value creation (Rashad, N. M. 2018).

- Overall, EM represents a paradigm shift in marketing, emphasizing resilience, strategic processes, and entrepreneurial innovation as key components of this approach.
 - **Innovation Orientation:** Innovation orientation refers to an organization's strategic focus on fostering innovation across various aspects such as marketing, operations, technology, and products/services to enhance competitiveness, customer satisfaction, and overall performance. (Nafissa Omar, et al. 2022 ; Mohammed Saleh, et al. 2022 ; Miguel, Díaz-Canel, et al. 2020). Innovation orientation is crucial for managers and executives to effectively manage innovation at the firm level and drive sustainable performance. It can lead to the development of innovative business models, eco-friendly practices, and the implementation of industry 4.0 technologies, ultimately contributing to improved operational and environmental performance. Additionally, an innovation-oriented approach can result in increased service innovation in government institutions, especially when supported by knowledge sharing.
1. **Customer Intensity:** Customer orientation in marketing refers to adapting a business to create unique consumer value, build long-term relationships, and satisfy customer needs, leading to competitive advantages and business growth. (Khurdei., et al. 2022). Abrokwah-Larbi, (2024). has also defined customer orientation in market orientation refers to focusing on understanding and satisfying customer needs and preferences to achieve long-term profitability and competitiveness in the industry. Lastly customer orientation is a strategic approach where organizations prioritize understanding and fulfilling the evolving needs and expectations of customers, aiming for long-term customer satisfaction and loyalty (Baker & Sinkula, 2019).
 - **Networking:** Entrepreneurial networking in SMEs is crucial for developing specialized marketing capabilities, involving strategic interactions for accessing key resources, and enhancing growth, and competitiveness, as per the research findings of Gabriela, et al. (2023). Furthermore, networking is a strategic and intentional process of building and maintaining relationships to exchange information, resources, and support, leveraging social connections for personal and professional development (Burt, 2017).
 2. **Technological Capabilities:** Technological capabilities refer to an organization's capacity to use and leverage advanced technologies, including hardware, software, and IT infrastructure, to achieve its strategic goals effectively and efficiently Teece, (2018). In other word, technological capabilities refer to a firm's strategy in developing a broad or

narrow portfolio of technologies, impacting inventive success in quantity and breakthroughs, as discussed by Symeonidou et al, (2022).

- **Remote Work Capability:** Employee digital competence is crucial for remote work success. Tools like CRM systems, Google Drive, and communication platforms are essential. Adaptation and skill assessment tools aid in effective remote work. Natalia, et al. (2020). "Remote work encompasses telework, where employees work outside the organization using technology. It challenges traditional work structures, promoting autonomy but also highlighting inequalities in gender and qualifications."
- **Artificial Intelligence (AI):** Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks that typically require human intelligence, such as learning, problem-solving, language understanding, and perception. AI technologies include machine learning, natural language processing, and computer vision (Russell & Norvig, 2022). As well as (AI) refers to the simulation of human intelligence processes by computer systems, including learning, reasoning, and self-correction, aiming to enhance educational experiences and outcomes through automated or intelligent systems." Zhai, et al. (2021).
- **Firm Performance:** Firm performance refers to the overall effectiveness and success of a business, encompassing various dimensions such as financial results, market share, and stakeholder value (Chen, et, al. 2020). In the context of the article "Firm performance in a global market" by De Loecker and Goldberg (2014), firm performance refers to the assessment and measurement of a company's productivity, profitability, growth, market share, innovation, and other relevant metrics within the framework of global market dynamics and competition.
- **Profitability:** Profitability is the ability of a company to generate earnings in relation to its costs and expenses, reflecting the efficiency and effectiveness of its business operations (Saini & Budhwar, 2021). Profitability could be defined as the extent to which a firm is able to generate financial gains or returns on its investments and operations, often measured through metrics such as net income, return on investment (ROI), or profit margins. Mithas & Rust, (2016).
- **Sustainability:** Sustainability can be defined as the practice of conducting business operations and activities in a manner that meets the needs of the present generation without compromising the ability of future generations to meet their own needs, encompassing

economic, environmental, and social considerations, as articulated in the article "Sustainability reporting and firm performance: A bi-directional approach" by Uwuigbe et al. (2018). Sustainability in a business context refers to the integration of economic, environmental, and social considerations to ensure responsible and ethical business practices for long-term success (Arena et al., 2018).

- **Presumed Customer Satisfaction:** Presumed customer satisfaction is the perceived level of contentment or positive evaluation that a company assumes its customers have, often inferred through feedback, surveys, and market analysis (Yi, 2016). In the article by Camilleri and Filieri (2023), customer satisfaction can be defined as the overall perception or evaluation of consumers regarding their experience with a product, service, or brand, encompassing factors such as perceived quality, value, and fulfillment of expectations, particularly in the context of online consumer reviews and their impact on revisit intentions.

LITERATURE REVIEW

Introduction

The literature review sheds light on the areas of entrepreneurial marketing (EM), firm performance, and technological capabilities. The discussion of each is conducted by the review of relevant literature to explain the relationship between entrepreneurial marketing and firm performance. It also explains the moderating effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance.

The fact of its originality means a growing business venture is more likely to face both uncertain market conditions and limited resources for marketing. When pursuing new opportunities with limited resources, the entrepreneur must use innovative approaches in the face of such constraints. While the marketing approaches used by entrepreneurs reflect this innovative orientation, they may vary in their relationship or effect on outcome goals. A new venture must understand which entrepreneurial marketing practices are most effective and therefore important to achieve a variety of successful outcome goals and ultimately for profitability and satisfaction.

Therefore, the purpose of this study is to link entrepreneurial marketing practices with firm performance in SMEs in Sudan.

The concept of entrepreneurial marketing (EM)

Entrepreneurial Marketing “EM” has gained significant academic legitimacy since its inception in the 1980s, and a sizeable body of various research on it has emerged (Hallbäck & Gabrielsson, 2013). Entrepreneurial marketing is a marketing strategy that can be better suited to resource constraints and challenges in SMEs (SMEs). Common to all definitions of EM is the concept that it lies at the nexus between entrepreneurship and marketing. Entrepreneurial marketing has opened the door to many research streams that have led to diverse views and meanings of the EM term. An alternative marketing model was needed to be identified which could also be used among small enterprises.

In this study, I have drawn the concept of EM developed by (Zahra & Garvis, 2000; Zahra et al., 2003). argue that EM includes seven dimensions. Five of these dimensions – proactiveness, innovation orientation, taking risk orientation, focusing on opportunity, and leveraging resources– derive and come from the literature on entrepreneurship. While other two dimensions of EM – value creation–and customer satisfaction orientation are derived from the literature on marketing (Hooley, et al., 2001; Kohli & Jaworski, 1990).

According to Alqahtani & Uslay, (2020); and Morris et al., (2002) organizations that choose EM as their strategy benefit from interlinking among the underlying dimensions. These interlinking are valuable when pursuing exploratory as well as exploitative innovation. Thus, the interlinking between the EM dimensions offers firms yet a different advantage, allowing them not only to create exploitative or exploratory innovation but to rotate between these innovation types.

This research responds to the call by (Webb et al., 2011; Lam and Harker 2015; and Jayawarna et al., 2014) for an EM theoretical base to advance the theory and the relationship between marketing and entrepreneurship and their link with firm performance which can then be used to make clear how small and medium terms enhances EM and other terms development skills. The connection between execution theories, sense-making, implementation, and contextual marketing demonstrates a clear interrelation between entrepreneurship and marketing and provides "a unique framework for advancing the understanding of the process and entrepreneurship and its potential marketing link" (Mpanza, 2016). EM is not only the nexus between marketing and

entrepreneurship, but furthermore marketing and entrepreneurship – customer-focused and entrepreneur/innovation-focused.

Firm performance (FP) of resource-based view (RBV)

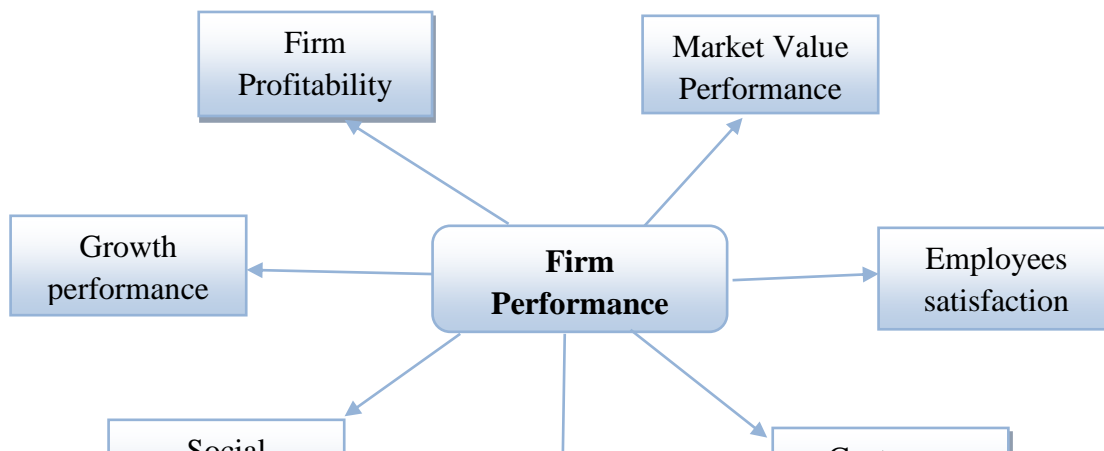
This part discusses the second concept of this study firm performance which represents the dependent variable, including the concept, the definitions, and the dimensions of firm performance. The firm's internal environment is highlighted as a source of competitive advantage by the resource-based view 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.

Dimensions of (FP)

Figure 1 List of identified dimensional for firm performance.



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

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). Based on the above-mentioned dimensions, and according to the recommendations of the participants in the qualitative phase of this study and for an (*Tacit 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, my study comes up with De Mendonca, & Zhou, (2019) for the adoption of profitability and customer satisfaction, and with Gupta, & Gupta, (2020) in terms of sustainability and profits.

The concepts of technological capabilities (TCPs)

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.

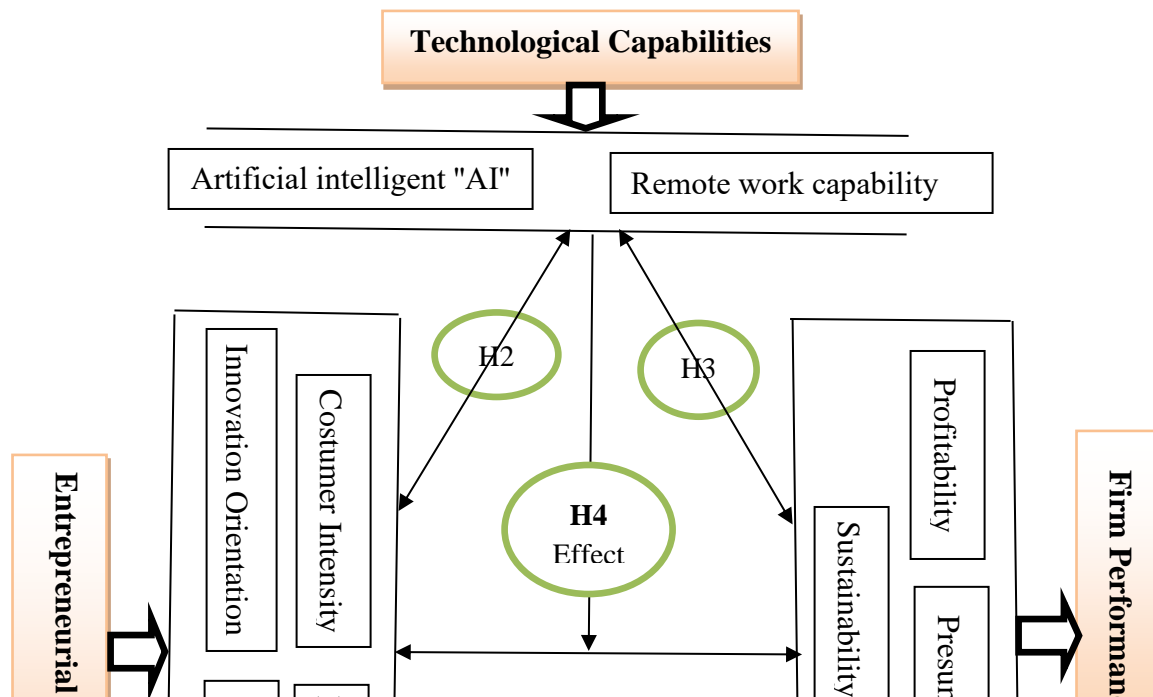
As a concept technological capability TCP refers to the ability of an organization to use a wide range of technologies, to develop innovative concepts to produce new products that are accepted by the consumer, and to adopt a rapid process development. This description thus underlines that technological capability not only involves technological mastering, but also investment in research and development, autonomous decision-making, and an innovative emphasis. In the past, technology has been an important source of competitive advantage for innovation (Taghizadeh et al., 2020).

An introduction to the “Fundamental Theories of The Study “

A theoretical framework is a conceptual model of how one theorizes are make logical sense of the relationships among the several factors that have been identified as important to the problem (Hamad, 2019, Sekaran, 2003). The aim of this study is to examine the impact of the moderating role of technological capabilities on relationship between entrepreneurial marketing on firm performance. The theoretical framework of the study is anchored on the {**Resource-Based View Theory & Dynamic Capabilities Theory**}. Thus, the concept of entrepreneurial marketing has been addressed by numerous studies such as: (Alqahtani & Usay, 2020; Hills & Hultman, 2013; Sadiku-Dushi et al., 2019; Ramadani et al., 2014; Rashad, 2018; Zahra & Garvis, 2000). The entrepreneurial marketing concept in this study is represented as a predictor for firm performance. To elaborate on the relationship between study variables, the research focused on the (RBV, DCT) theories as explained by numerous researchers.

The conceptual framework of the study

Figure 2 describe the conceptual framework of the study.



Source: own creation (2024).

Hypotheses development of the study

In this study, there are four main hypotheses were developed to test the relationship between entrepreneurial marketing dimensions and firm performance. Moreover, testing the relationship between entrepreneurial marketing dimensions with technological capabilities. Alongside, testing technological capabilities variables with firm performance and finally, testing the moderating role of technological capabilities between entrepreneurial marketing and firm performance. The following four hypothesis represent the summary above-mentioned theoretical framework of the study.

{H1: Entrepreneurial marketing has positive relationship with firm performance}.

{H2: Entrepreneurial marketing impacts positively on technological capabilities}.

{H3: Technological capabilities impact positively on firm performance}.

{“H4: Technological capabilities play a moderating role in the relationship between EM and firm performance}.

General research design

First phase: qualitative approach

The objective of the qualitative phase in this study is to analyze and explore in-depth the understanding and extended awareness of entrepreneurial marketing EM and to which extent the Sudanese entrepreneurs, managers, and employees are knowledgeable and familiar with the discipline of EM as a strategy that can be implemented in their enterprises. Thus, I have designed

the main question of EM: What are the factors/dimensions that come to your mind when you hear about entrepreneurial marketing? followed by questions about firm performance as well as the technological capabilities TCPs. The purpose was to develop the research pre-model of my study. And to achieve this purpose the study was conducted using a qualitative approach by implementing a thematic analysis.

Meanwhile the study adopts an *inductive philosophy* in qualitative methodology, I have applied “Grounded Theory” by which I went briefly over the numerous trustworthiness verification techniques, see appendix 1. Subsequently, I used to begin thematically analyzing the qualitative data. As a result, the current study and other studies are in line Singh et al., (2021) which perhaps used as an illustration of how to modify the suggested general framework for trustworthiness verification to fit certain qualitative approaches. (See Appendix 2).

Second phase: Quantitative approach

The objective of the quantitative phase is to examine the application of entrepreneurial marketing EM insights on firm performance FP in Sudanese SMEs. The study tries to explain the relationship between entrepreneurial marketing and firm performance by testing technological capabilities as a moderating role. Based on previous literature, this research attempts to provide some explanation and description of how EM may create positive FP for SMEs in Sudan.

In this manner, my 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 has been 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 (Abkar, 2019, Sekaran, 2003). In addition, a cross-sectional survey design will be conducted to assess the moderating effect of technological capabilities on the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs.

Data collection instruments, process, and sample-size

From a qualitative aspect:

The data used for this research has been gathered by conducting six (6) interviews and “discussions” employing various instruments of qualitative structure, these instruments were

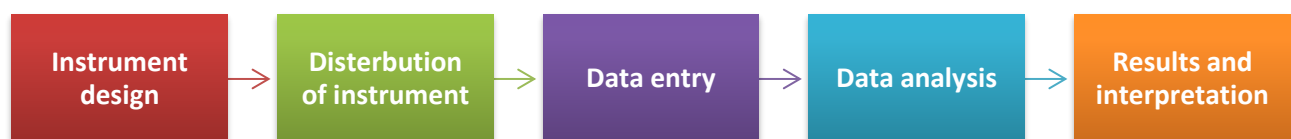
(semi-structured, in-depth FGDs, Mini-FGDs, mutual interviews, and individual interviews) with nascent Sudanese entrepreneurs, managers, and employees whom active in the fields of services and industries. Moreover, I implemented a subjective sampling to select information-rich cases for this study (Nouri et al., 2018).

Following purposive sampling in qualitative methodology and to address the exact research community of SMEs in Khartoum-Sudan, I have sent out the invitation letter for 28th entrepreneurs male and female alike. First of all, I searched for the right participants through their profiles on the most frequently used platforms in SDN (Facebook and LinkedIn, <https://gs.statcounter.com/social-media-stats/all/sudan>). Therefore, most of the participants were in the middle age between 24 to 40. Meanwhile, participants were from different disciplines of academics, service, and industry. Moreover, after obtaining the participants' permission, all discussions were audio-recorded. The discussions lasted between 40 and 60 minutes. The strategy I have relied on in this methodology is to improve the questions in the scenario throughout the discussions respectively as well as modifying the research pre-model for further development. Furthermore, four of these discussions have been conducted in the English language, whereas two discussions were carried out in the Arabic language.

Sample size from a quantitative approach

Since my study population is unknown or considered to be fairly large, which makes it difficult to determine the size of the study sample, I therefore resorted to calculating it according to the Cochran equation, On the other hand, there are computer programs for calculating sample size based on the same Cochran 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 $\pm 5\%$ of the measured/surveyed value.

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



Data analysis

Firstly: Qualitative methodology

Summary of thematic analysis

Table 1 Presents the generated multidimensional findings for entrepreneurial marketing, technological capabilities, and firm performance.

First theme	Dimensions	Second theme	Dimensions	Third Theme	Dimensions
Entrepreneurial marketing	Innovation orientation	Technological capabilities "TCPs"	Security	Firm Performance "FP"	Financial performance: Revenue/profits. return on investment (ROI), and shareholder value
	Focus on opportunities		Digital communication capability		Sustainability
	Segmentation		Digital tools		Customer satisfaction
	Customer intensity		Ability to work remotely		Growth
	Proactiveness identification		Artificial intelligent "AI"		Operational efficiency
	Leveraging resource		Research and Development Capability R&D		Employee satisfaction
	Risk management		Technological Acquisition		
	Value creation		New business models		
	Agility		Agility and Flexibility		
	Networking				

Own creation, based on thematic analysis (2024).

Secondly: Quantitative methodology

Path Analysis, Hypothesis Testing and Discussion

Introduction

After conducting a descriptive analysis of the sample and examining the dependent and independent variables in the SMEs context, this chapter aims to assess the reliability of the measurement model as well as the validity of the structural model. For this, modeling by structural equations using the software "Smart PLS 3" will be used.

Evaluation of the model according to the PLS approach: A two-step process

In this section, I focus on evaluating the model using the PLS approach: a two-step process. The first step of this process involves assessing the measurement model, where I verify internal consistency and convergent and discriminant validity. Once this step is completed, I move on to the second step, which involves evaluating the structural model, where I analyze the relationships between the variables of the model and draw conclusions about their significance and impact.

Firstly, I describe our initial measurement model without adjustments. This step provides us with a baseline from which we will evaluate the changes made by subsequent adjustments. Next, I examine the reliability of the measurement scales used for each latent variable. Reliability indicates the extent to which the measures of each latent variable are consistent and free from random error.

Once reliability is assessed, I present our adjusted measurement model, which is the result of modifications made based on the results of the initial evaluation. These adjustments aim to improve the accuracy and validity of the model by optimizing the linear relationships between latent variables and manifest variables.

After establishing our adjusted model, I proceed to evaluate convergent validity. This involves checking if different measures of the same latent variable are indeed consistent with each other, thereby strengthening the validity of our model.

Finally, I address discriminant validity, which involves determining if latent variables are indeed distinct from each other. In other words, I verify if our model avoids confusion between different underlying dimensions. Once I have confirmed that our measurement model exhibits adequate internal consistency and convergent and discriminant validity, the next step is to evaluate the results of the structural model using the appropriate tests mentioned later.

Analysis of Hypothesis Testing Results

In this section, I conducted an in-depth analysis of the hypothesis testing results to better understand the relationships between the studied variables.

“H1: Entrepreneurial marketing impacts positively Firm performance”

Based on our research findings, Hypothesis H1 asserts that entrepreneurial marketing positively influences firm performance. The variables under consideration are entrepreneurial marketing dimensions: Innovation Orientation, Customer intensity, and Networking, and firm performance indicators: Profitability and Sustainability.

Our analysis indicates a significant positive impact, supported by a standardized beta coefficient (Std Beta) of 0.162 and a very low p-value of 0.000.

This suggests that entrepreneurial activities focused on innovation, customer intensity, and networking effectively enhance both profitability and sustainability within the firm. These results underscore the critical role of entrepreneurial strategies in driving overall organizational performance.

Therefore, our hypothesis is: **Accepted**

“H2: Entrepreneurial marketing impacts positively Technological capabilities”

Hypothesis H2 explores the relationship between entrepreneurial marketing and technological capabilities, specifically Remote work capability and Artificial intelligence. Our findings reveal a substantial positive influence, with a Std Beta of 0.853 and a p-value of 0.000, indicating strong statistical significance.

This highlights that entrepreneurial marketing efforts, including innovation orientation, customer intensity, and networking activities, significantly bolster the technological capabilities of the organization.

This alignment suggests that firms actively engaged in entrepreneurial marketing are better equipped to adopt and leverage advanced technological tools such as remote work capabilities and artificial intelligence, thereby enhancing operational efficiency and competitive advantage.

Therefore, our hypothesis is: **Accepted**

“H3: Technological capabilities impact positively Firm performance.”

Hypothesis H3 posits that technological capabilities positively affect firm performance, focusing on Remote work capability and Artificial intelligence as key technological dimensions, and firm performance indicators: Profitability and Sustainability.

Our analysis supports this hypothesis with a Std Beta of 0.812 and a p-value of 0.000, indicating a robust and statistically significant relationship. This finding suggests that investments in enhancing technological capabilities, particularly in remote work infrastructure and artificial intelligence, lead to improved firm performance metrics such as profitability and sustainability.

Organizations with advanced technological capabilities are better positioned to adapt to changing market dynamics, innovate more effectively, and achieve sustainable growth objectives.

Therefore, our hypothesis is: **Accepted**

In conclusion, our research provides compelling evidence that entrepreneurial marketing strategies, encompassing innovation, customer intensity, and networking, play a pivotal role in shaping both technological capabilities and overall firm performance.

The findings underscore the interconnectedness of entrepreneurial activities and technological advancement in driving organizational success. By strategically leveraging entrepreneurial marketing practices and investing in technological enhancements, firms can not only enhance operational efficiency but also achieve sustained competitive advantage in dynamic business environments.

These insights emphasize the strategic importance of fostering a culture of innovation and technological agility within organizations seeking to thrive in modern markets.

Moderator Effect Test

Moderation refers to a situation where the relationship between two concepts is not stable but varies depending on the values of a third variable, known as the moderator variable (Garson, 2016; Hair et al., 2017).

In the context of my research, I focus the study on validating the hypotheses I have already formulated:

“H4: Technological capabilities play a moderating role in the relationship between entrepreneurial marketing and firm performance.”

I aim to determine whether the hypothetical relationship between “**entrepreneurial marketing**” and “**firm performance**” is indeed influenced by a significant moderating effect, as illustrated in Figure 4.

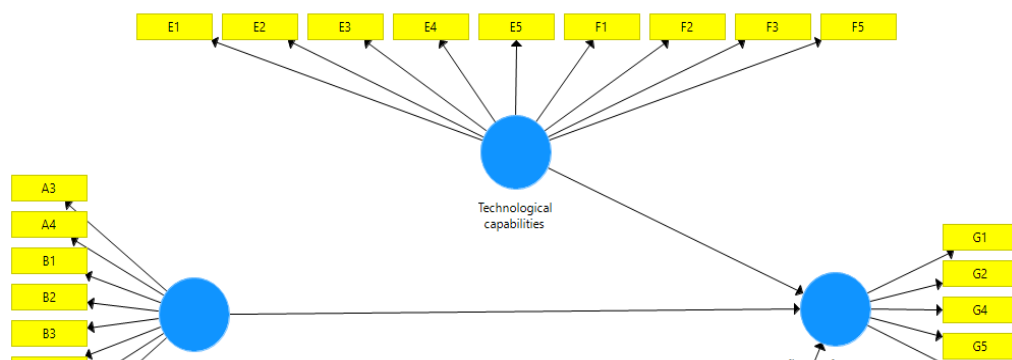


Figure 4: Moderation model

The table below presents the results of the analysis of the moderating effect of the variable “**Technological capabilities**” on the relationship between “**entrepreneurial marketing**” and “**firm performance**”.

These results help determine the extent to which “**Technological capabilities**” influence this hypothetical relationship and highlight the importance of this variable in the context of our study.

Table 2: Results of the Moderating Effect

	Path coefficients	P - value
Technological capabilities -> Firm performance	2.225	0.027

According to my research, this hypothesis suggests that technological capabilities act as a moderator in the relationship between entrepreneurial marketing and firm performance. Specifically, it examines how variables such as Remote work capability and Artificial intelligence influence the impact of entrepreneurial marketing dimensions (Innovation Orientation, Customer intensity, Networking) on firm performance indicators (Profitability, Sustainability).

My findings indicate a significant moderating effect of technological capabilities. The P-value associated with this relationship is 0.027, which falls below the conventional threshold of 0.05. According to Hair et al. (2017), a P-value outside the range [0.05, 0.95] is considered significant, indicating that technological capabilities indeed play a crucial role in influencing how entrepreneurial marketing strategies translate into firm performance outcomes.

This result suggests that firms with advanced technological capabilities, such as robust remote work infrastructure and effective utilization of artificial intelligence, enhance the effectiveness of their entrepreneurial marketing efforts. These capabilities facilitate better innovation management, customer intensity strategies, and networking activities, thereby amplifying their positive impact on profitability and sustainability metrics. Essentially, technological readiness enables organizations to leverage entrepreneurial initiatives more effectively, leading to improved overall performance in competitive markets.

In conclusion, my study provides empirical support for the hypothesis that technological capabilities moderate the relationship between entrepreneurial marketing and firm performance. The findings underscore the strategic importance of integrating advanced technological tools and infrastructures into entrepreneurial strategies to achieve sustainable competitive advantage and superior business performance. By investing in and leveraging technological capabilities, organizations can optimize their entrepreneurial activities and better navigate dynamic market conditions, thereby enhancing their long-term viability and success.

Thus, **our hypothesis H.4 is Accepted.**

Table 3: Test of the Moderating Effect

Hypotheses		Results	Significance
H.4	Technological capabilities play a moderating role in the relationship between entrepreneurial marketing and firm performance	Significant differences	Accepted

Contributions to Scientific Knowledge

This study makes significant contributions to the academic literature by shedding light on the **moderating role of technological capabilities** in the relationship between entrepreneurial marketing (EM) and firm performance, particularly within the context of **Sudanese SMEs**. While much of the previous research has focused on the direct impact of entrepreneurial marketing on firm outcomes, this study offers new insights into how **technology can amplify and enhance the effects of EM**. By showing that technological capabilities act as a key enabler in this relationship,

the study highlights the importance of technology not just as a support mechanism, but as a crucial driver of entrepreneurial success in emerging markets.

One of the key contributions is the **empirical evidence** provided by this research, demonstrating that firms with better technological infrastructure—such as remote work capabilities and artificial intelligence (AI)—are better positioned to leverage the benefits of entrepreneurial marketing. This empirical finding is particularly important for understanding how technological readiness interacts with entrepreneurial strategies to drive **profitability and sustainability**. The results indicate that technology plays a pivotal role in maximizing the effectiveness of EM, especially in markets like Sudan where technological adoption is still evolving but has the potential to significantly improve business performance.

The study also advances the methodological approaches used in examining these relationships by applying **Partial Least Squares Structural Equation Modeling (PLS-SEM)**. This methodological framework strengthens the reliability and validity of the findings, offering a robust way to evaluate complex interactions between multiple variables, such as entrepreneurial marketing, technological capabilities, and firm performance. The PLS-SEM method is particularly well-suited for exploratory research in emerging markets, where data may be less structured, but insights are crucial for advancing both academic understanding and practical business strategies. By using this method, the study provides a more nuanced and comprehensive analysis of the dynamics between EM and technological capabilities, making a valuable contribution to the fields of entrepreneurship, technology management, and SME performance.

Furthermore, the focus on **emerging markets** like Sudan adds to the global understanding of entrepreneurial marketing and technology's role in these environments. Prior studies have predominantly examined these concepts in developed economies, but this research shows that **technology-driven entrepreneurial strategies are equally relevant and impactful** in less mature markets. It opens up new avenues for future research, particularly in other emerging markets with similar economic and technological conditions.

Managerial Implications and Practice Novelty

The managerial implications of this study are clear and actionable, especially for **managers of Sudanese SMEs**. The findings suggest that investing in **technological capabilities** is crucial for maximizing the impact of entrepreneurial marketing strategies on firm performance. Managers who wish to enhance their company's profitability and sustainability should prioritize **digital**

transformation as part of their overall business strategy. This includes adopting key technologies such as **remote work infrastructures**, which allow firms to operate flexibly, and **AI tools**, which can help optimize customer intensity, automate processes, and enhance decision-making capabilities.

The study provides practical insights into how technology can directly influence business outcomes by fostering **innovation, improving customer intensity, and enhancing networking** activities. For example, managers can use AI to personalize marketing efforts and anticipate customer needs, which not only enhances customer satisfaction but also drives repeat business and loyalty. Similarly, **digital networking platforms** can help SMEs expand their market reach, build stronger partnerships, and access new opportunities in local and international markets. These technologies offer SMEs the tools to better **compete** in an increasingly digital and globalized marketplace, where the ability to innovate and quickly adapt is critical to success.

One of the novel contributions of this research is its focus on **technological adoption in emerging markets**, where the level of digital integration is still developing. For managers in Sudan, this study emphasizes the **untapped potential of technology** in improving firm performance. While technological adoption may currently be limited due to infrastructural or financial constraints, this research underscores the long-term benefits of investing in technology. SMEs that prioritize technological enhancements are more likely to **achieve sustained competitive advantage** by improving their agility, operational efficiency, and ability to innovate.

Moreover, the research offers **practical recommendations** that are tailored to the specific challenges faced by Sudanese SMEs. For instance, managers are encouraged to invest in affordable yet impactful technologies, such as cloud-based solutions for remote work or AI-powered customer relationship management (CRM) systems. These tools not only improve internal efficiencies but also open new possibilities for **business growth and market expansion**.

In conclusion, the study provides a **proposal for managers** aiming to improve their firm's performance through the strategic integration of **entrepreneurial marketing and technological capabilities**. By adopting digital tools and infrastructures, firms can significantly enhance their competitiveness, both locally and globally. This research is particularly relevant for managers navigating the complexities of **emerging markets**, where the alignment of entrepreneurial strategies with technological investments holds great potential for driving long-term success.

Scientific novelty of my studies

Table 4: Research Scientific novelty

Primary research methos	ID	Thesis value creation	Thesis & the novelties of the thesis	Scientific novelty
Empirical & exploratory qualitative research	1st Theme (EM)	<i>Segmentation</i>	The qualitative findings, allowing an in-depth exploration of Entrepreneurial Marketing dimensions such as segmentation, networking, and agility . This finings highlight the significant answers for the research RQ1:1 and also confirm the second objective that I intends to explain the extent level of understanding and EM marketing (EM) paradigm.	New
		<i>Agility</i>		
		<i>Networking</i>		
	2nd Theme (TCPs)	<i>Artificial Intelligent "AI"</i>	A respondent contributed that artificial intelligence "AI" will give the firm good intensity, and good interactions especially since the company come up with the technology in everything.	Novel
		<i>Remote-Work Capability</i>	Utilizing employees' effort empowerment intensely in a remote place may accelerate job performance. Therefore, in line with previous studies, this study defines remote-work capability (RWC) as an employee's ability to use digital technology, trained to leverage resources and capture opportunities innovatively through digital equipments, to solve customer	New
		<i>Digital Communication</i>		Novel

			problems and make effective performance for the firms.	
		<i>New business models</i>	The existing dimension of TCPs is the ability of an organization to generate new business models that take advantage of technical advancements and add value for consumers and shareholders alike.	New
Descriptive & analytical quantitative research	(RQ2) (H1)	<i>The Relationship Between EM and Firm Performance</i>	This study determines a statistically significant positive relationship between EM and firm performance, as indicated by a robust beta coefficient. This suggests that SMEs that apply EM strategies—such as innovation orientation, customer intensity, and networking—are better positioned to improve key performance metrics, particularly profitability and sustainability.	Novel
	(RQ3) (H2)	<i>The relationship between EM and TCPs in Sudanese SMEs</i>	I demonstrates that EM is a key driver of technological adoption. SMEs that invest in EM are more likely to develop and leverage advanced technologies, such as AI and remote work tools, to improve their business operations and maintain a competitive edge.	New
	(RQ1) (H4)	<i>The Moderating Role of TCPs in the Relationship Between EM and Firm Performance</i>	The results from the PLS analysis confirm that TCPs not only impact firm performance directly, but also strengthen the relationship between EM and firm performance, amplifying the positive effects of entrepreneurial marketing strategies.	New

Source: own creation (2025).

Research Limitations

Despite the study's significant contributions, certain limitations should be noted. First, the study focuses on Sudanese SMEs, which may limit the findings' applicability to other locations with differing economic, technological, and regulatory contexts. Entrepreneurial marketing and

technology capabilities may function differently in mature economies or businesses other than the SME sector.

Second, the study mainly utilizes a cross-sectional research approach to capture relationships at a specific point in time. This reduces the capacity to establish causal links between entrepreneurial marketing, technology skills, and business performance. A longitudinal approach could provide further insight into how these associations change over time.

Third, while the study employs both qualitative and quantitative approaches, potential biases in qualitative data collecting may influence the interpretation of results. External circumstances, such as Sudan's economic turmoil or regulatory changes, may influence participants' perceptions and responses. Furthermore, the quantitative sample size, while statistically justified, may restrict the findings' robustness in capturing varied SME situations. Finally, while the study focuses on certain dimensions of technological capabilities, such as artificial intelligence and remote work capabilities, it does not investigate other new technologies that may influence business performance, such as blockchain, big data analytics, or cybersecurity measures. Future study may broaden the scope to incorporate these parameters.

Suggestions for further research

Based on the conclusions of this study, several topics merit additional exploration. Future study should look into how entrepreneurial marketing and technology capabilities interact in various economic circumstances, notably between emerging and developed economies. Comparative research conducted across multiple countries may provide a more complete knowledge of these links.

Additional research could look into how other technical aspects, such as cloud computing, blockchain, or the Internet of Things (IoT), influence firm performance. Understanding the broader impact of technology on SMEs will become increasingly important as adoption rises. Future research could look into the newly identified dimensions of entrepreneurial marketing—segmentation, networking, and agility—to see how they affect firm performance across different industries and economic contexts, providing a better understanding of their strategic importance for SMEs.

Finally, considering the growing importance of sustainability, future research might look into how technology capabilities influence environmental and social sustainability in SMEs. This would broaden discussion beyond financial performance to include the overall company impact.

Publications relevant to the thesis.

1. Fegada A. & Veres Z. (2024) The Significance of Innovation Orientation in Firm Performance: Technological Capabilities as A Moderating Role. DOI: <https://doi.org/10.19044/esj.2024.v20n10p16>
2. Fegada A. & Veres Z. (2024) The Impact of Customer Intensity in Firm Performance: Tech Capabilities as A Moderating Variable. DOI: <https://doi.org/10.19044/esipreprint.3.2024.p526>
3. Fegada A. & Veres Z. (2024) The Moderating Role of Technological Capabilities in the Relationship between Entrepreneurial Marketing and Firm Performance: A Qualitative Approach. DOI: <https://doi.org/10.19044/esj.2024.v20n7p1>
4. Fegada A. & Veres Z. (2024) The Significance of Networking as A Dimension of Entrepreneurial Marketing in The Firm Performance: Tech Capabilities as A Moderator. *The 2024 WEI International Academic Conference Proceedings: Wien, Vienna, Austria 2024.04.23. - 2024.04.25. The West East Institute, pp 3-3 (2024).*

External Peer Reviewer to:

- *How do travel bloggers influence generation Z's travel decisions? An exploratory study through five Italian famous travel bloggers. European scientific journal "ESJ" (2025).*
- *The effect of entrepreneurship education on undergraduate students' entrepreneurial intention. Asian journal of economics, business, and accounting (2023).*

Full/General publications at MTMT Profile link.

<https://m2.mtmt.hu/frontend/#view/Publication/SmartQuery/1127/>

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Appendix 1. Trustworthiness Verification: Qualitative Validity.

Measures of Trustworthiness	Methods and verification strategies
<p>1. Credibility:</p> <ul style="list-style-type: none"> • Adequacy of the research methods and its components. • Triangulation of data method • Triangulation of respondent 	<p>The justification for choosing a qualitative approach is explained along with the research's objective and background. The research methods have investigated what they claim to. The study explained the general research strategy that was designed to accomplish the study's objectives. The sampling approach was wisely chosen.</p> <p>The researcher utilized multiple methods for collecting the data.</p> <p>The study employed respondents from different disciplines.</p>

<ul style="list-style-type: none"> • Reflective explanation 	<p>The researcher considered the respondents' emergent thinking and impressions during the discussions.</p>
<p>1. Transferability:</p> <ul style="list-style-type: none"> • How effectively a single study's outcomes from one context will transfer to other contexts 	<p>To broaden the findings' applicability, data were gathered across a variety of contexts and times. Data from each respondent was used to represent theoretical concepts.</p>
<p>2. Dependability:</p>	<p>We highlighted the numerous processes outlined in our methodology section and explicitly described our research processes to create an audit trail.</p> <p>We further increase the transparency of our research process by including tables that explain how the coding scheme was theoretically derived, how it was operationalized, and how it performed.</p>
<p>3. Confirmability:</p> <ul style="list-style-type: none"> • Reflexive analysis 	<p>The goal is to make sure that the results are independent from the researcher's biases.</p> <p>The researcher attempted to accurately record our concerns and biases throughout the study process as part of the reflective analysis.</p>