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

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Exploring attribute-based purchasing decision preferences

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

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ABSTRACT

This study provides in-depth insights into the moderating role of technological capabilities (TCPs) in shaping the relationship between entrepreneurial marketing (EM) and firm performance (FP) within Sudanese SMEs. The research objectives were twofold: qualitatively, to explore the extent of familiarity and educational background of Sudanese managers, employees, and entrepreneurs regarding EM and TCPs, and quantitatively, to analyze and describe the impact of these variables on SME performance with TCPs acting as a moderating factor. The study employed a mixed-method approach, beginning with an inductive qualitative phase involving 15 purposively selected interviewees. Data were collected through a series of focus group discussions (FGDs), mini-FGDs, joint interviews, and individual interviews, allowing a thorough exploration of EM dimensions such as segmentation, networking, and agility. Thematic analysis was conducted using NVivo software, revealing new EM dimensions tailored to the Sudanese SME context, which were then validated with grounded theory criteria (detailed in Appendix 2). Following the qualitative phase, the research progressed to a deductive quantitative approach, employing SmartPLS software to test and interpret the significance of the final model. An online questionnaire distributed across multiple platforms yielded 255 responses from the SME community. Analytical tools such as Frequency Analysis, Principal Component Analysis (PCA), Rotation Matrix, Correlation, ANOVA, and Path Analysis were utilized to rigorously analyze the data. Results indicate that TCPs partially moderate the relationship between EM and FP, with significant moderating effects on profitability, sustainability, and customer satisfaction. The findings highlight both significant and non-significant relationships among variables, with partial support across all hypotheses, offering a nuanced understanding of EM's effect on FP in the presence of technological capabilities. This research contributes to academic literature by addressing a contextual gap in EM studies within Sudan's SME sector and provides actionable recommendations for policy and SME managers to strategically enhance firm performance by leveraging EM practices with existing TCPs.

Keywords: Entrepreneurial Marketing, Technological Capabilities, Firm Performance, SMEs, Sudan, NVivo, SmartPLS, Customer Intensity, Innovation, Agility, Sustainability.

Research motivation

The motivation behind this research stems from the recognition of the pivotal role that small and medium-sized enterprises (SMEs) play in Sudan's economic landscape. As engines of employment and innovation, SMEs contribute significantly to the nation's economic growth. However, these enterprises often operate under resource constraints, necessitating a nuanced understanding of the factors that influence their performance.

In the contemporary business environment, global technological trends are reshaping industries and markets. SMEs in Sudan, like their counterparts worldwide, face the challenges and opportunities brought about by digitalization and technological advancements. Exploring how technological capabilities moderate the relationship between entrepreneurial marketing strategies and firm performance becomes imperative in this context. Hence, the selection of SMEs in Khartoum, Sudan, is justified by the existing gap in the literature, emphasizing the necessity of exploring how these enterprises utilize entrepreneurial marketing strategies. This investigation is particularly significant given the orientation of new businesses in Sudan, shedding light on the role of entrepreneurial marketing in fostering technological capability within the local context.

The research is further motivated by the recognition that resource constraints are a defining characteristic of SMEs. Despite these limitations, understanding how technological capabilities can enhance or moderate the impact of entrepreneurial marketing efforts is essential. This exploration holds the potential to uncover strategies that allow SMEs to navigate digital transformations effectively, gaining a competitive advantage within their resource limitations. Beyond the practical implications for SMEs, the study has broader policy implications. Insights into how technological capabilities interact with entrepreneurial marketing can inform policymakers on crafting initiatives and support mechanisms that foster a conducive environment for SME growth in Sudan. This, in turn, aligns with overarching economic development goals. From an academic standpoint, the research contributes to the existing literature by filling a gap in understanding the nuanced relationships between entrepreneurial marketing, technological capabilities, and firm performance. By focusing on the Sudanese SME context, the study aims to enrich the academic discourse on these dynamics within the framework of emerging markets, offering insights that extend beyond the immediate scope of the research.

CHAPTER 1
INTRODUCTION

Introduction

This chapter contains the background of the study, an introduction to the SME sector in Sudan, a statement of the problem, research questions, and research objectives, afterwards, I delve to clarify the significance of the study, and a penalization operationalization definition of key variables used in this study and lastly organization of the study.

1. 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).

On the other hand, technological capabilities encompass a firm's ability to leverage technological resources and innovations for competitive advantage. In the context of SMEs in Sudan, the intersection of entrepreneurial marketing and technological capabilities becomes particularly critical, influencing how these businesses adapt to the digital era and navigate global market complexities. This research aims to investigate the moderating role of technological capabilities in shaping the relationship between entrepreneurial marketing and firm performance within SMEs in Sudan. Recent studies highlight the importance of understanding the impact of technology on marketing strategies and firm outcomes in various contexts (Coviello et al., 2017; Morgan et al., 2020). By delving into these dynamics, the study seeks to provide actionable insights that can inform strategic decision-making and policy formulation for SMEs in Sudan. Moreover, the study is aligned with the current discourse on the role of technology in entrepreneurship and marketing practices in emerging economies (Hultman & Shaw, 2017; Miocevic et al., 2017). Through a nuanced exploration of these dynamics, this research contributes to the academic understanding of entrepreneurial marketing, technological capabilities, and firm performance, offering practical implications for SMEs in Sudan's unique business environment.

Hence, the importance of this research is to increase the understanding of how entrepreneurial marketing dimensions affect the performance of SMEs. Moreover, this study

explores how certain dimensions of EM correlate with the firm performance dimensions. Thus, the research focuses on identifying correlations of EM dimensions and their impact on the performance of SMEs in Khartoum-Sudan. Similarly, this research attempts to explore the impacts of technological capabilities as a moderating role in the relationship between entrepreneurial marketing and firm performance in Sudanese small and medium-sized enterprises.

Concerning the scientific methodology this research tends to combine the quantitative descriptive approach and the qualitative exploratory approach to describe and collect data from the respondents and then analyze that data, draw conclusions, and verify hypotheses. Accordingly, the research applies in the first phase the qualitative exploratory approach to collect data from entrepreneurs, managers, and employees of small and medium enterprises, and it was planned to conduct an online multiple qualitative method. These interviews aim to collect information about the extent of respondents' knowledge and understanding of the research pre-model especially the field of EM and to which extent they employ the concepts of this study in their firms.

Based on the final model, which has been built based on qualitative findings, the research moves further to the second phase, the quantitative descriptive approach, to collect data from these enterprises located in Khartoum, which are approximately more than 500 active small and medium enterprises in various types of industries and services.

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 tries to fill the gap similarly in the literature given that there is still a scarcity of quantitative and qualitative studies. The findings 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.

2. Small and Medium-sized enterprises (SMEs) in Sudan

Sudan is a lower-middle-income country with a gross domestic product (GDP) per capita income of about $ 1500 and, in 2015 a total population of 39 million, with an average annual population growth rate of about 3 percent. This high population growth rate has resulted in a relatively young population and a high proportion of the labor force being of a productive working age. An average of about 55 percent of the total population is between the ages of 15 and 64 years, and creating enough jobs for them is a major challenge (Gangi & Mohammed, 2017).

Moreover, about 66 percent of the total population lives in rural areas with little access to quality education and health services. Thus, a large proportion of Sudanese suffer from illiteracy, poverty, unemployment, high mortality at birth, and low life expectancy. These factors have resulted in Sudan being ranked very low in terms of human development indicators. Furthermore, Sudan's economy is characterized by public sector domination of the productive sector, leaving limited room for the private sector to expand. Even the slim private sector is largely dominated by informal sectors, which remain the most important source of production and employment (Country Watch 2015).

Table 1. describes the available data on the total number and density of micro-, small-and medium-sized enterprises (MSMEs) in Sudan in comparison with several African countries. The selection of these countries is governed by the availability of data on these variables. As I observe from the table, the number and density of MSMEs in Sudan lag behind the selected countries. At the time when the density of these firms was only 0.7 in Sudan, it reached 87.4 in neighboring Kenya and 74.6 in Tanzania. Even when I compare Sudan with the other selected countries, I found that it has the lowest number as well as the lowest density of the MSMEs. This reflects an underdeveloped state of entrepreneurship in Sudan in comparison with some other African countries.

Table 1 Micro-, small-, and medium-sized enterprises in Sudan and other countries

Micro-, small-, and medium-sized enterprises		
Country	Total number	Per 1000 people (2000–2005)
Sudan	22,460	0.7
Uganda	160,453	6.2
Kenya	2,800,000	87.4
Tanzania	2,700,000	74.6
Ghana	25,679	1.2
Algeria	580,000	18.8
Botswana	14,986	3.8

Source: World Bank, World development Indicators 2007

2.1.Definition of small and medium-sized enterprises

There is no standard for defining SMEs, as the SME definition differs across countries depending on the specific criteria used. According to European Union (EU) criteria, SMEs are firms having less than 250 employees (OECD 2017) while SMEs in Central Asia are defined differently depending on the size of fixed assets and the number of employees is less than 200 (OEDC 2018). SMEs are defined as enterprises that have five to 99 employees. Small firms are firms having five to 19 employees, whereas medium firms are those having 20 to 99 employees (Kijkasiwat & Phuensane, 2020).

The positions of Arab countries differed regarding the definition of small and medium enterprises while several countries have a definition of small and medium enterprises based on a law, including Jordan, Kuwait, Saudi Arabia, UAE, Palestine, Egypt, Bahrain, Tunisia, Mauritania, Sudan, and Morocco. However, other countries are still trying to establish an appropriate definition. For the countries that have a definition of small and medium enterprises, there is a difference in definitions from one country to another due to the different standards used. Sudan adopts the definition adopted by the International Labor Organization. According to this, SMEs in Sudan can be defined by the number of employees which is defined as 1 to 10 employees as for the small firms, whereas medium firms can be defined by 10 to 50 employees" (AMF, 2017). Even

though Sudan's SME sector is growing more rapidly than before, its contribution to the country's GDP is still tiny, Thus, doing research in this area is necessary.

3. 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.

4. 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?

5. 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.

6. Importance of the research topic

Small and medium-sized enterprises (SMEs) are essential in developing countries, playing a significant role in economic development and social progress. In Sudan, SMEs contribute substantially to employment, economic diversification, and the promotion of entrepreneurship. The country, located in northeastern Africa, faces both challenges and opportunities in developing its SME sector, particularly as it undergoes socio-political transitions. The resilience and adaptability of SMEs are critical for ensuring sustainable economic growth. Sudan's SMEs operate in various sectors such as agriculture, services, manufacturing, and technology.

Research on this subject could cover several areas. SMEs make important contributions to economic growth and job creation in emerging economies, with many of them expanding dynamically and reinforcing the local economy (Ayandibu & Houghton, 2017; Gurayah, 2023; O'laoire & Welford, 2014; Sharma & Kohli, 2019). They are key players in promoting inclusive and sustainable growth, aligning with the UN Sustainable Development Goals (Sharma & Kohli, 2019). Furthermore, SMEs foster economic linkages between small and large businesses, enhance entrepreneurial capacity, and help build resilient economies (Ayandibu & Houghton, 2017). They also contribute to international trade, with many exporting their products and services, thus supporting the country's foreign exchange earnings and economic stability (Sharma & Kohli, 2019). In addition, SMEs are often more flexible and quicker to adapt to new technologies and market trends, playing a key role in innovation and competitiveness in local markets (Mugano, 2023).

Despite facing significant challenges, such as limited access to finance, infrastructure limitations, and regulatory hurdles, SMEs in Sudan show an impressive capacity for innovation and contribute to local economic development. Understanding the dynamics of these enterprises

involves exploring their specific challenges, the government initiatives in place, and the potential to cultivate a thriving entrepreneurial ecosystem. SMEs in developing countries face obstacles related to financing, international relations, knowledge, and technology. Nonetheless, their importance in sustainable economic development and poverty reduction is widely acknowledged. Supporting SMEs remains vital for achieving long-term growth in these regions.

7. **Significance of the study**

The significance of this study arises from literature review of entrepreneurial marketing and technological capabilities to carry out their role on firm performance. Therefore, the significance of this study can be illustrated through the following two classifications:

7.1.Theoretical significance

- Due to the little agreement in the literature that constitutes entrepreneurial marketing remains conceptualized only at the level of abstraction in existing models, thus, this study contributes to knowledge about some of the entrepreneurial marketing (innovation orientation, customer intensity, risk management, and networking).
- This study is an attempt to build a conceptual framework that contributes to theories and practices in the field of entrepreneurial marketing.
- This study can add to the knowledge about how technological capabilities play a moderating role between entrepreneurial marketing and firm performance.
- Enhance the understanding of the phenomenon of EM within the context of Sudanese SMEs.

7.2. Practical significance

Several practical contributions are expected to emerge from the current research represented in the following:

- This study attempts to make managers and entrepreneurs aware of the changes and complexity of the business environment.
- The study can provide managers and entrepreneurs with an appropriate understanding of the importance of entrepreneurial marketing for firm performance in SMEs.

- The study aims to provide a framework for the relationship between entrepreneurial marketing and firm performance, and the moderating effects of technological capabilities of SME firms in Sudan. this framework can assist as a practical guide for managers and entrepreneurs by improving their understanding of the mechanism of entrepreneurial marketing strategy in more adaptability.
- This study offers new insight for Sudanese entrepreneurs, owners, and managers to develop their entrepreneurial behavior and strategies to strive a competitive advantage by addressing the dimensions that improve the performance of their organizations.

8. Definition of key terms

- **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). It involves embracing a culture of innovation, understanding competition dynamics, promoting organizational flexibility, and developing specific capabilities and knowledge resources. (David, et al. 2019). 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. Innovation orientation is a multifaceted construct within strategic management focusing on fostering innovation culture, competition understanding, flexibility, and knowledge capabilities to enhance organizational performance. (David, et al. 2019).

- **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. (V., Khurdei., et al. 2022). Abrokwah-Larbi, K. (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).
- **Risk Management:** Utomwen, M. (2024) stated that risk management in project management involves identifying, evaluating, responding, and monitoring risks to ensure successful project development and delivery within set time and budget constraints. Risk management involves the systematic identification, assessment, and mitigation of potential risks to achieve organizational objectives, emphasizing a proactive and integrated approach to uncertainty (Hillson, 2019). Risk management is the decision-making phase of the Risk Analysis Cycle, combining elements from risk assessments with cost, benefits, and socioeconomic factors to select the best option and minimize adverse effects. (Ramos-Peralonso, 2021).
- **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).

- **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." Vartiainen, M. (2021). Moreover, remote work capability encompasses an organization's ability to enable and support employees to perform their tasks efficiently and securely from locations outside the traditional office setting, often facilitated by digital technologies and communication tools (Golden & Gajendran, 2021).
- **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.

9. Research novelty

The research novelty in examining the moderating role of technological capabilities in the relationship between entrepreneurial marketing and firm performance in SMEs in Sudan lies in several key aspects:

Contextual Relevance

Novelty: Focusing specifically on SMEs in Sudan brings a contextual relevance that acknowledges the unique economic, social, and technological landscape of the region.

Importance: Understanding how the interplay between entrepreneurial marketing, technological capabilities, and firm performance operates in a Sudanese SME context is crucial for tailoring strategies to the specific challenges and opportunities in the local business environment.

SME Emphasis

Novelty: Many studies often concentrate on larger enterprises, and the emphasis on SMEs is novel, given their distinct characteristics, resource constraints, and pivotal role in economic development. ***Importance***: SMEs constitute a significant portion of the business landscape in Sudan and studying the **moderating** role of technological capabilities in this segment contributes valuable insights that can be directly applicable and beneficial for smaller businesses.

Entrepreneurial Marketing Lens

Novelty: Entrepreneurial marketing is a relatively recent area of study, and applying this lens to SMEs in Sudan adds a novel perspective to the existing literature. ***Importance***: SMEs often exhibit entrepreneurial characteristics, and understanding how entrepreneurial marketing practices interact with technological capabilities can provide guidance for fostering innovation and competitiveness in these businesses.

Technological Capabilities in Sudan

Novelty: Investigating the role of technological capabilities in a Sudanese SME context is unique, considering the country's evolving technological landscape. ***Importance***: Sudan, like many other developing nations, is experiencing technological advancements. Examining how SMEs leverage and develop technological capabilities can shed light on the role of technology in business growth within emerging markets.

Practical Implications for SMEs

Novelty: Emphasizing practical implications for SMEs in Sudan differentiates the research by providing actionable insights that can directly benefit the targeted businesses. ***Importance***: SMEs often lack extensive resources for technological investments, and understanding how to strategically leverage existing capabilities can guide these businesses toward sustainable growth.

Contribution to Academic Knowledge

Novelty: The research contributes to the academic literature by addressing a specific gap in knowledge related to the interaction between entrepreneurial marketing, technological

capabilities, and firm performance in the Sudanese SME context. ***Importance***: Bridging this gap not only advances scholarly understanding but also offers a foundation for future research in similar contexts and contributes to the global discourse on entrepreneurship, marketing, and technology in SMEs. To conclude, the research novelty lies in its contextual focus on SMEs in Sudan, the integration of entrepreneurial marketing and technological capabilities, and the practical implications it holds for businesses in the region. This study has the potential to make a meaningful impact by advancing both academic knowledge and providing actionable insights for SMEs in Sudan.

10. Organization of the research

The research is divided into six chapters as follows: Chapter One, Introduction: This chapter overview highlights the Background of the study, SME sector in Sudan, Research statement, Research problem, Research questions, The objectives, The significance, The importance of the research topic, Definition of terms, Research novelty and the Organization of the study. Chapter Two, Literature Review: presents the theoretical perspectives of research variables. Chapter Three, theoretical framework, and hypotheses development: introduced the theoretical framework, conceptual framework, and hypotheses development. Chapter Four, Research Methodology: Describes the research design and methodology for empirically testing the hypotheses. The methodology includes the unit of analysis, data collection, and statistical techniques. Chapter Five, Data analysis, hypotheses testing, and the interpretation of the results. Chapter Six: discussion, and conclusions: including presentations of the results that provide discussion of research implications, the limitations, and directions for future research.

CHAPTER 2
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.

1. 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.

Entrepreneurial marketing is an initial phenomenon that appeared in small companies or new enterprises. Thus, entrepreneurial marketing can be interpreted as marketing with an

entrepreneurial mindset since it is the organizational role of marketing considering innovativeness, risk-taking, pro-activeness, and the pursuit of opportunities without regard for the resources currently; Effective entrepreneurial marketing creates value for customers "through relationships, particularly through innovation, creativity, sales, and immersion into the market, networking or flexibility. Therefore, this point makes small and medium enterprises establish more focused business conditions to achieve targeted goals through an entrepreneurial marketing approach.

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 all., 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. Its dimensions and their interconnections make EM a unique strategic posture. The researcher agrees that it is theoretically necessary to distinguish EM from other strategic situations such as market orientation (MO) and entrepreneurial orientation (EO) to establish EM as a distinct field of research. In the literature on entrepreneurship, businesses following an EO concentrate on creativity, proactiveness, and risk-taking, according to their school of thinking, although many EO dimensions are shared by EM, such as leveraging resources is not an aspect of EO and autonomy, and competitive aggressively is not a feature of EM.

Hills & Hultman, (2011) has contributed to the EM context arguing that traditional marketing that is created in literature may not be completely applied to small and medium enterprises. The company's conduct is another stream of entrepreneurial marketing analysis. This stream found that EM as a more promising opportunity to describe the marketing of companies that are small and resource-limited enterprise-driven entrepreneurial actions. Subsequently, the extent of research has extended from small companies to large companies. Many previous studies

illustrate that however limited, entrepreneurial marketing can be used for any size of business (Hisrich & Ramadani, 2017; Kraus et al., 2009).

Crick et al., (2020) suggested that entrepreneurial marketing EM relates to rising innovative products in close interface with customer's orientation, leveraging resources of partners, and by innovative techniques to attain market acceptance these results are very interesting. In marketing and entrepreneurship literature, the concept of EM has primarily been associated with the need for creativity and innovation in small firms. However, a different stream of literature perceives EM as entrepreneurship in marketing and views it as an entrepreneurial and innovative practice in corporate and large-scale Learning styles businesses Morris et al., 2002).

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.

All EM definitions, however, have something in common; they all include both marketing and entrepreneurial aspects. The most frequently EM definition that can be found in the literature (Rashad, 2018) defines EM 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".* The further definitions of EM that may be frequently found in literature will be chronologically existed in Table 2 below:

Table 2 : Definitions of entrepreneurial marketing EM.

Definitions	Author
EM is marketing carried out by entrepreneurs or owner-managers of entrepreneurial ventures.	Stokes (2000, p. 2)
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).
"Marketing of small firms growing through entrepreneurship".	Bjerke and Hultman (2002, p. 15)
EM is the overlapping aspects between entrepreneurship and marketing; therefore, it is the behavior shown by any individual and/or organization that attempts to establish and promote market ideas, while developing new ones in order to create value.	Bäckbrö & Nyström (2006, p. 13)
A particular type of marketing that is innovative, risky, and proactive, focuses on opportunities and can be performed without resources currently controlled.	Kraus et al. (2009, p. 30)
EM is a spirit, an orientation as well as a process of passionately pursuing opportunities and launching and growing ventures that create perceived customer value through relationships by employing innovativeness, creativity, selling, market immersion, networking and flexibility.	Hills and Hultman (2011, p. 6)
EM is a set of processes of creating, communicating and delivering value, guided by effectual logic and used a highly uncertain business environment.	Ionita (2012, p. 147)
The marketing processes of firms pursuing opportunities in uncertain market circumstances often under constrained resource conditions.	Becherer et al. (2012, p. 7)

EM is a combination of innovative, proactive, and risk-taking activities that create, communicate, and deliver value to and by customers, entrepreneurs, marketers, their partners, and society at large.	Whalen, et al. (2016).

Source: Nora Sadiku-Dushia, et al., 2019).

Since the EM sector is generated at the crossroads of entrepreneurship and marketing, neither has a widely accepted concept and having regard to the heterogeneous existence of both fields, the normative and widely agreed concept of EM is very difficult to arrive at this instance (Stokes & Wilson, 2009).

Entrepreneurial marketing implies intensity and motivation rather than a dispassionate, analytical planning process highlight how the dimensions of entrepreneurial marketing should be considered as "processes to create, network and deliver values". Thus, these processes which lead to the use of traditional marketing approaches in innovative ways or in green and different ways to leverage resources (Thomas et al., 2013). Thus, based on the overall marketing prospects, entrepreneurial marketing is an extension to current marketing theory. Moreover, both concepts are similar in terms of creating value for business sustainability, but there are several differences in the characteristics of each concept. summarizes in the following table the distinction between traditional marketing and entrepreneurial marketing.

1.1. Entrepreneurial marketing and traditional marketing

Table 3 Comparison between traditional marketing and entrepreneurial marketing

Principles of marketing	**Entrepreneurial Marketing**	**Traditional Marketing**
Concepts	Oriented innovation (encouragement of ideas), assessment of market needs intuitively	Consumer-oriented (market forces), product development through formal assessment
Method	Interactive marketing method, word-of-mouth marketing, and direct selling	Marketing mix, 4Ps/7Ps
Strategy	Bottom-up approaches from consumer and other influenced group	Top-down approaches of segmentation, targeting, and positioning
Market Intelligence	Informal networks and information gathering	Formal research market and intelligence system

Source: Stokes (2000).

In line with four marketing concepts, a more in-depth exposure is described as follows (Stokes, 2000) when contrasting traditional and entrepreneurial marketing:

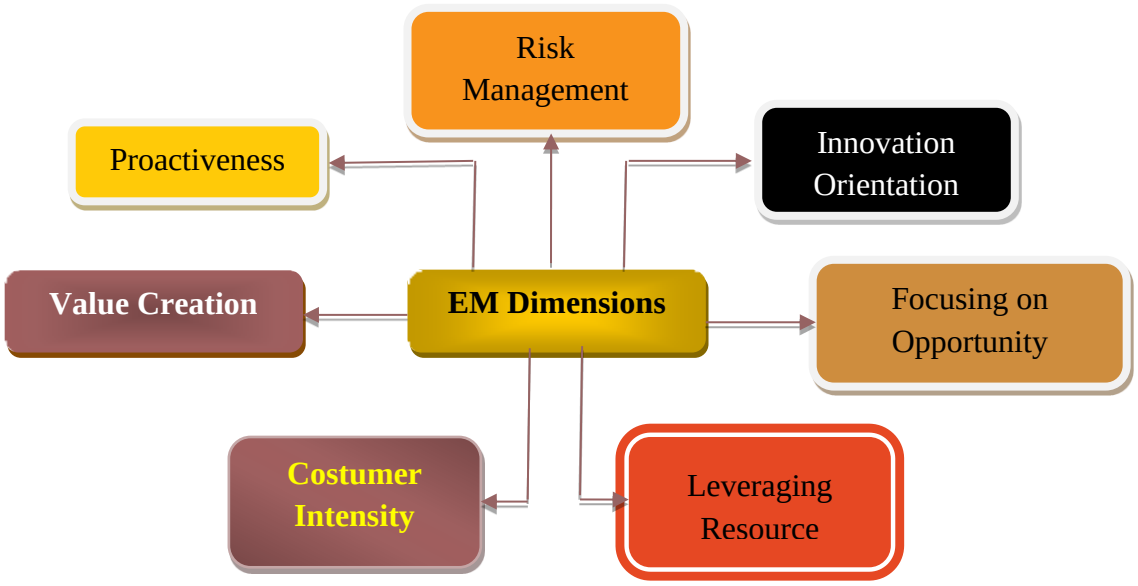
- On the principle of "concept" that discussed the business orientation, note that contrarily traditional marketing which is defined by the customer orientation, entrepreneurial marketing defined by entrepreneurship and innovation. Innovation-oriented, innovative concepts, intuitive market ideas or a rigorous evaluation of market needs tend to lead business owners and mall enterprises.
- In the "method" or tactical level principle, small companies prefer digital marketing rather than the 4P or 7Ps model. They try to make direct and personal by means of digital marketing customer communication, this is when employees perform personal sales and marketing relationships.
- Traditional marketing at strategic level includes a highly down-to-date approach and a consistent sequence of events such as segmentation, targeting, and positioning. An effective SME entrepreneur, on the other hand, practices the bottom-up approach as

opposed to traditional marketing: (1) Identifying and testing market opportunities through trial and error; (2) to address the needs of many customers then to increase direct customer interaction and to consider their needs and preferences; (3) adding to your old customers new customers with identical profiles. This practice also happens by chance, including new clients, who result from the early recommendation of the customer.

- As for market intelligence, small-scale businesses prefer using informal methods, such as monitoring or personal data collection, through their marketing activities and Communication network, not formal research on the market. Rejecting formal methods of research is a reasonable product of the fact that most of them do not believe in forecasting the future.

1.1.1. Entrepreneurial marketing "EM" dimensions

Figure 1 Presents Entrepreneurial marketing dimensions.



Becherer, et al., (2012)

Referring to the figure above, different researchers have used various classifications in recent years when reviewing the behavior of the business EM. These classifications vary in terms of content but are different in the number of dimensions they are used according to the context of the analysis. Although the behavior of EM is widely studied, no consensus exists on several dimensions of the behavior of EM (Kilenthong et al., 2015).

Previous researchers have recognized a variety of dimensions of EM behaviors like innovation-oriented risk-taking, focus on opportunity, and flexible approaches for markets Hills & Hultman, (2013); furthermore, Miles and Darroch (2006) in their study, analyzed how large companies could exploit entrepreneurial marketing processes to gain and renew a competitive advantage, their study has used previous research on entrepreneurial marketing and entrepreneurship practices, using examples from a long-term business case study in New Zealand, Sweden, the United Kingdom and the United States, to show how large corporations can strategically use their entrepreneurial marketing processes to build or identify, evaluate and take advantage of entrepreneurial opportunities better and more effectively. They adopted risk management, pro-activeness, opportunity-driven, innovation, customer intensity, value creation, and resource leveraging as the variables explaining this competitive advantage. Their findings provided insight into the use of entrepreneurial marketing dimensions for large corporations to expand.

1.1.2. Innovation orientation IO

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 Bill Gates stated in (2008), and (Waples and Rushes 2008).

(Trott, 2017) stated 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 4). 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.

Table 4 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, (2017)

Table 5 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, P. (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, I 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.

1.1.3. Customer intensity CI

Since the perspective has shifted from product and sales to a market orientation, which implies that value originates from solutions that address and satisfy the customers' needs, interest in the creation of customer value has grown and has been the subject of intense discussion. To increase customer happiness and consequently raise revenues, businesses have to recognize and satisfy these consumers' needs (Kotler, 2012).

Customer orientation is the implementation of the marketing concept and a customer-centric business philosophy (2022) Customer Orientation. Moreover, customer orientation is a business approach that emphasizes customer value, satisfaction, and involvement in the company. It is seen as beneficial for business success and innovation. The concept of customer orientation has been studied extensively in the literature, with research focusing on various aspects such as the measurement of customer orientation, the impact of gender and experience on customer orientation, and its application in different contexts. Studies have also highlighted the importance of customer orientation in the context of industrial service innovation, where manufacturers have shifted their focus from goods to services and customer solutions. The evolving concept of customer orientation requires a wider view that includes value co-creation, open and closed innovation, and the involvement of multiple stakeholders (Xin, Zhao 2021, Magre, et al. 2011, Heidi, Korhonen. 2015, Sonny, Nwankwo 1995).

The marketing process makes a strong point about how important it is to align one's company with the needs of the customer and develop relevant values. Consequently, satisfying the needs of customers by living up to their performance and quality expectations strengthens a successful long-term relationship with them (Hewing, 2013).

Figure 2 Profit chain of customer orientation

Hewing, M. (2013).

Customer-satisfaction-oriented firms strive to understand customers voiced and latent needs to develop products and services that the market desires. In this line, companies go to great lengths to collect and act on market intelligence that allows them to determine customer wishes. In addition, companies aiming for customer satisfaction try to engage in emotionally close relationships with their customers (Morris et al., 2002; Bachmann et al., 2021). Therefore, participants have come together that a firm or any company should give superlative consideration to its customers/clients and work hard to satisfy their needs, wants, and expectations (Customer-oriented or Customer-intensity) so that firms can reach their advanced objectives and maximize profits. Additionally, a customer intensity strategy can assist the firm to retain and acquire new customers and that positively leads to growth, stability, and sustainability during the firm life cycle.

Here are some quotations of the qualitative discussions that insured the importance of customer intensity as a dimension of EM that can be suitable for the small and medium-sized ventures: *{"I believe that Customer Intensity can rapidly increase customer loyalty and retention and can assist in positive word-of-mouth referrals and PR." (2nd Mini-FGDs, Male 1)}. {"For me as a customer representative this dimension improve customer satisfaction and NPS scores." (2nd Mini-FGDs, Female)}. {"According to my experience in the firm focusing on customer could help to reach higher revenue and profits due to repeat business and cross-selling opportunities this can assist also to get more accurate customer personas and targeted marketing." (2nd Mini-FGDs, Male 2)}.*

1.1.4. Risk management RM

Companies have to deal with numerous risks when making decisions, such as about investments to develop novel products and services. Companies with a risk-taking orientation strive for calculated risk-taking; that is, they are ready to encounter higher risks if potential outcomes promise to lead to higher returns, as long as these risks can be reasonably assessed and

potentially be mitigated, such as through intensive product testing, collaborative product development with other companies, or flexible resource commitment (Bachmann et al., 2021).

One of the main contributions that I have gained throughout my qualitative discussions is that one of the participants has insured risk-taking as a dimension of EM, she reasoned that the SM projects are facing many threats during their establishment stages and along with their durability in the market, thus, managing this threats and risks can remind you to be unique from competitors. {"*In entrepreneurial marketing, I see the importance of taking risks as long as you have opportunities, as long as they are small projects, you can see the risks to be unique from competitors outside the framework". (2nd Interview, Female)}.* Another quotation *{"I believe that managing risk can provide a heighten confidence and trust of stakeholders, investors, and customers." (2nd Mini-FGDs, Female)}.*

1.1.5. Networking

In EM the network is viewed from the entrepreneur's perspective. This means that he is the main actor, and the connections are the relations established to conduct marketing activities. Thus, a new concept emerged - the marketing network - which is defined by structural and interactional dimensions (Ionita, 2012).

Networking refers to the actual process of liaison with contacts within the network; it is about individuals and companies working alongside each other and cooperating through the exchange of ideas, knowledge, and technology. SMEs and entrepreneurs will have some kind of network that is likely to encompass all aspects of the network domain (i.e., personal contact, social, business, industry, trade, and marketing networks). The collective definition, intended to encompass all network aspects, is A collection of individuals who may or may not be known to each other and who, in some way, contribute something to the entrepreneur, either passively, reactively, or proactively, whether specifically elicited or not. An entrepreneur's network is represented by people who can help the entrepreneur make decisions for the well-being of the enterprise (Gilmore & Carson, 1999).

Marketing by networking is a naturally inherent aspect of entrepreneurial decision-making in which entrepreneurs exchange and seek ideas, knowledge, and market-related information through their business activities and contacts. This is because entrepreneurs must go outside the firm's physical confines to do business and this business is a market-led activity. Thus,

entrepreneurs are doing marketing through all their normal communication activities (e.g., interacting and participating in social, business, and trade activities). Marketing by networking is used by SME entrepreneurs to develop, enhance, and support all aspects of the marketing activity by networking with customers and potential customers and by industry and business networks (specifically about promotions), word-of-mouth communication, and information-gathering activities. (Gilmore & Carson, 1999).

Therefore, based on the above details I can define networking as: “Networking is a "competence" or talent that can be learned, developed, and grown by practice, just like any other competence or skill.” Thus, in this study networking can be implemented as an entrepreneurial marketing source to help entrepreneurs and managers of SMs in Khartoum to collaborate and employ their business-to-business relationship or even business-to-costumer relationships to ensure sustainability and to maintain extraordinary performance for their firms.

1.2. The need for entrepreneurial marketing

Marketing academics asked the adequacy of traditional marketing and introduced a new marketing paradigm; numerous empirical studies indicate that traditional marketing principles do not involve all marketing strategies. This is the case with who found that service companies conduct a range of practices not covered by the traditional concept of the marketing mix. Thought that both customer orientations as well as customer interactivity lacks the traditional marketing mix definition. The other explanation why it was important for a new marketing paradigm is the fact, especially for small and medium-sized enterprises, that today's business environment is very difficult. The competitive environment is characterized by growing risk, instability, chaos, transformation, and contradiction (Nora Sadiku et al., 2019).

Moreover, EM has now emerged as a new marketing paradigm to help businesses reconsider how they do marketing, in order to respond to these shifts in their business environment. EM will help also businesses survive and respond to identified changes.

It is apparent that EM needs most when the traditional marketing practices are no longer sufficient and the world is characterized by uncertainty, Because these characteristics are present on the market today, the implementation of EM would be useful to most today's companies (Morris et al., 2002).

1.3. Strategies of entrepreneurial marketing

In business schools, the idea that the main purpose of an organization is to get a profit while meeting the needs and expectations of customers. Higher output (i.e., profitability) can occur if a business has a competitive advantage over other companies and then explores where the company's advantage has become a critical process in which companies seek to distinguish themselves in the market. Furthermore, companies must be strategic in order to sustain their advantage over a period of time.

Thus, strategic marketing includes an analysis of the market's organizational relationships with 'customers, consumers, rivals, and others, and of the idea of plans for achievement of objectives such as sustainable competitive advantages (Morrish, et, al. 2011).

The strategy concept for EM companies relies on both intended and autonomous strategies to help form the strategic concept of an EM company based on opportunities. A proactive, opportunity-oriented marketing approach phase and cooperates with the EM strategy conceptualization, Moreover the core feature of this definition of EM is that a uniquely cheaper and different or very different positioned product offers give a competitive advantage and perhaps incorporate uniqueness such as branding and production process, which produce new goods that are very different from those of competitors Consequently, companies that practice EM, regardless of whether they are big or small, can be regarded as an entrepreneurial firm (Morrish et al., 2010).

EM is a creating value process, and both marketing and entrepreneurship aims at creating value, Therefore, it is necessary to recognize the value in an exchange phase to maintain contact to sellers' customers, when established value is modified by addition to creativity. A traditional marketing strategy is to overpower a seller in a market and the perceived value of the consumer is defined can be profitable. This can be used if entrepreneurs retain current markets and exchange the same value for the consumer. EM strategy is to discover fresh and unexplored opportunities. When this strategy is being implemented, entrepreneurs can explore new markets but use the same business models in each new market by providing equal value logic (Sadiku-Dushi et al., 2019).

Following the conceptualization of earlier studies there are many previous studies have deals EM with multiple dimensions. Moreover, most of the previous studies, discussed one components of EM. Sadiku-Dushi et al., (2019), Becherer et al., (2012), Kilenthong et all., (2015), Miles and Darroch (2006). Consequences, my research has adopted based on the previous studies and qualitative findings the four main dimensions of EM.

2. 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.

2.1. The Concept and Definitions of Firm Performance FP

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.

Firms' performances nowadays, is the first to be examined by investors from all over the world, as the world has smaller in the sense that enterprises may now be conducted from anywhere. Globalization enhances commercial operations and high performance, and it allows businesses to expand their opportunities for growth by eliminating barriers to corporate trade and financial investment. The firm's success is mostly explained by its performance during a certain period. Researchers have worked hard to come up with metrics for the concept of performance, which is an important one. The ability to measure a company's performance allows for the comparison of its results throughout various periods. However, no precise metric that can assess every facet of performance has been presented up to date (Al-Matari et al., 2014).

Furthermore, with the greatest generational spread in technology, people who are interested and concerned about attaining their tasks from anywhere are encouraged to look for any company around the world that has a strong track record of investment performance. As a result, the company's performance is the most essential factor that encourages customer to come. consequence, those in charge of running firms must improve their performance by implementing new plans and procedures to update their operations and transactions throughout their life cycle" (Al-Matari et al., 2014).

Any company's management must be able to measure its performance. It is impossible to enhance a process without first measuring the results, consequence, measuring the influence of organizational resources on business performance is necessary for improving organizational performance. Thus, business performance, or firm performance as I refer to it in this study, is a subset of organizational effectiveness that covers operational and financial outcomes.

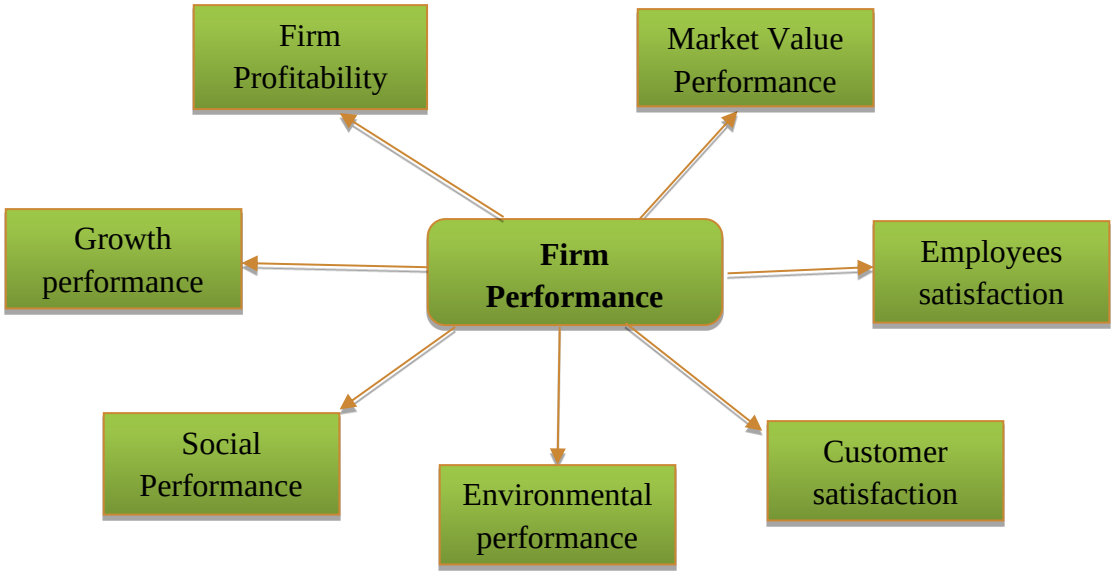
Taouab, & Issor, (2019) provided a set of definitions to illustrate the concept of organizational performance:

- Performance is a set of financial and nonfinancial indicators that offer information on the level of accomplishment of objectives and results.
- Performance is dynamic, requiring judgment and interpretation.
- Performance may be illustrated by using a causal model that describes how future results can be affected by current actions.

- Performance may be understood differently depending on the person involved in the assessment of the firm performance.
- To define the concept of performance, it is necessary to know its fundamentals characteristics to each area of responsibility.
- To report a firm's performance level, it is necessary to be able to quantify the results.

2.2. Dimensions of (FP)

Figure 3 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.

2.2.1. 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).

2.2.2. 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).

2.2.3. 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.

3. 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).

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).

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).

According to the theory of dynamic capabilities DC and results in the literature suggest that the TCPs play a significant and positive moderating role. Therefore, few previous studies investigated TCPs as moderate variables such as Wu, (2014) investigated a significant and positive moderate effect of TCPs on the relationship between cooperation with competitors and product innovation, while Haeussler et al., (2012) state that TCPs influence effectively on relationship between Strategic alliances and product development, while Ferna and Garcı, (2012) investigated a significant and positive moderate effect of TCPs. And José and Ortega, (2010) confirmed a significant and positive moderate effect of TCPs on the relationship between Competitive strategies and firm performance.

3.1. Remote Work Capability (RWC)

The idea of remote work has recently received significant importance in practice and academia due to the COVID-19 pandemic (Adamovic, 2022). Gartner surveys reveal 82% of the 127 company leaders prefer remote work initiatives (Baker, 2020).

Firms like Facebook, Microsoft, HP, Amazon, and Intel are allowing employees to work remotely using advanced technology. Nearly 60,000 Facebook staff are likely to work remotely even after the COVID-19 pandemic. Mark Zuckerberg, Facebook's founder, and CEO has been quoted to have said that remote work and being out-of-the-office made him "happier and more productive at work," given "more space for long-term thinking," and empowered him to "spend more time with family" (Motamarri, et al. 2022).

Additionally, in my qualitative discussions a participant has summarized how to be skillful and can do a job and work wherever you are. Throughout this argument, I can assess how it was efficient in real practice during the COVID-19. Therefore, it is considered a technological transformation to keep working constantly. {"*the ability to work remotely so you can optimize like the resources you have, so you get the best of the best. You're not limited to a geographical limit. So, technology starts with the equipment that helps you and the software that help you optimize whatever job you're doing" (1st Interview, Female)}.* Lastly, 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, to solve customer problems and make effective performance for the firms.

3.2. Artificial Intelligent (AI)

The adoption of emerging technologies has contributed considerably to SMEs' ability to effectively overcome challenges, collaborate, and interact with their business customers, and improve firm performance (Agnihotri, et al. 2016).

Artificial intelligence (AI) is a system's ability to interpret and learn from data mimicking human intelligence, and it is part of a new generation of technologies that introduce novel approaches in the business context. AI applications, such as process automation and optimization, analytics, dynamic pricing, and prediction, can be used in diverse ways across business functions to enable organizations to obtain a variety of benefits in terms of greater revenue, efficiency,

agility, productivity, and reliability, as well as better decision making and customer experience (Baabdullah et al., 2021).

In a survey of executives, Ransbotham et al., (2019) found that 90% of respondents agree that AI presents an opportunity for their organization. and Basri (2020) has also argued that the adoption of AI by SMEs can lead to increased market share and higher revenues. I have furthermore obtained a contribution for TCPs throughout FGDs. Respondent contributed that artificial intelligence "AI" will give the firm good intensity, and good interactions especially since I have come up with the technology in everything. *{"Maybe the use of artificial intelligent (AI) will gives you good intensity, good interactions specially I come up with the technology in everything." (FGDs, Female 2)}.*

Summary of the chapter

This chapter indicates the theoretical foundation of aspects related to the research concepts and analyzes the empirical studies related to them. The researcher employed various resources & websites to gather and summarize the literature review such as "Science direct website, Google scholar, MDPI publisher, and Scispace website" …etc. Moreover, "Plagiarism detector website" was employed to check out the plagiarism in the research. The Researcher utilized "Zotero platform" to save and to classify the collected articles based on the research Keywords "EM, TCPs, FP" Accordingly, the first part of the chapter presented the foundation, and conceptualization of entrepreneurial marketing. and the constructs of entrepreneurial marketing (innovation orientation, customer intensity, risk management, and networking) that enable a firm to gain a competitive advantage. In section two the chapter conceptualization of firm performance and the constructs of firm performance (profitability, sustainability, and presumed customer satisfaction). Section four is the chapter conceptualization of technological capabilities and their constructs (remote work capability and Artificial intelligence).

CHAPTER 3
THEORETICAL FRAMEWORK AND HYPOTHESES

Introduction

This chapter presents the theoretical framework of the study which describes the relationship between the variables, independent, dependent, and moderating variables. Followed by the hypothesis's development is formulated based on the developed research framework.

1. Underlying Theories of The Study

A theoretical framework is a conceptual model of how one theorizes are making 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 & Uslay, 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:

1.1. The resource-based view theory (RBV)

The resource-based view provides the theoretical foundation for this study regarding the effect of entrepreneurial marketing on firm performance through technological capabilities. The RBV suggests that firms employ their physical, human, and organizational resources to gain an advantage in the marketplace If these resources are valuable to customers, rare, and difficult to replicate, then these resources give rise to sustainable competitive advantage, enhancing firm performance, thus, the basic premise is that resources increase the efficiency and effectiveness of firms in general and the development of new services (heng & Sheu, 2017).

The resource-based view explains that the identification and possession of internal strategic resources contribute to a firm's ability to create and maintain a competitive advantage and improve performance thus, the Firm's resources include tangible and intangible resources (Barney, 1991).

Resources that are simultaneously valuable, rare, imperfectly imitable, and imperfectly substitutable are an important source of competitive advantage, the unique bundle of resources owned by heterogeneous firms is expected to explain inter-firm performance differences (Hoopes, et, al. 2003). Therefore, firm resources, which can be tangible or intangible, include All assets, capabilities, organizational processes, firm attributes, information, and explicit or tacit knowledge. Controlled by a firm that enables the firm to conceive and important strategies that improve its efficiency and effectiveness (Kellermanns et al., 2016).

Madhani, (2010) recommended that the resource-based view should consider not simply possession of resources/capabilities, but rather "strategic flexibility" concerning decision-makers' ability to pivot their business models within unstable markets. Actually, Chen et al., (2022) offers a readiness index for owner-managers to survive or even thrive in light of environmental circumstances. In this current study, these extensions are considered by exploring how owner-managers engage in TCPs activities to strengthen their performance-enhancing entrepreneurial marketing behaviors.

1.2. Dynamic capability theory (DCT)

The dynamic capabilities theory (DCT) explains that to sustain their competitive advantage firms need to renew their stock of valuable resources as their external environment changes. The (DCT) provides the theoretical foundation for this study regarding the effect of entrepreneurial marketing orientation on firm performance through technological capabilities. This means that if a firm possesses Valuable, Rare, Inimitable, and Non-substitutable resources but does not use any dynamic capabilities, its superior returns cannot be sustained without dynamic capabilities and a firm's returns may be short-lived if the environment exhibits any significant (Barney, 1991; Helfat, & Peteraf, 2009).

Dynamic capabilities are derived from the resource-based view of the firm, which suggests that resources are developed through specialized routines that create distinct competencies (Teece et al, 1997). he has also defined dynamic capabilities as the processes and routines used to adapt, and alter, deploy, and protect the firm's resources so to maintain them as a source of competitive advantage. Helfat (2009) simplifies this definition as, the capacity of an organization to purposefully create, extend, or modify the resource base. Dynamic capabilities distinguish themselves from operational processes in that the dynamic capability of a firm influences the

change and reconfiguring of existing operational processes (Ali et al., 2012; Helfat & Peteraf, 2009). These further encourage the renewal and development of operational capabilities to better match the demands of the market environment.

Teece (2007) suggests that dynamic capabilities can be broadly broken down into (i) the capacity to sense and shape opportunities and threats from the external environment, (ii) to seize opportunities by responding and implementing the appropriate changes, and (iii) to provide the environment in which to maintain competitiveness through reconfiguring tangible and intangible resources. Although, Teece, (2007) defined the deployment of dynamic capability as the process of identifying and seizing market chances and reconfiguring the resource base. In the same context, the RBV defines organizational capabilities as the ability to use resources to create a competitive advantage (Hamad, 2019, Ozkaya, et al., 2015). Capabilities are defined as organizational routines that enable firms to perform distinctive activities (Teece et al., 1997).

An organizational resource refers to an asset or input to production (tangible or intangible) that the organization owns and controls or has access to on a semipermanent basis, and an organizational capability refers to an organizational ability to perform a coordinated task, utilizing organizational resources, to achieve a particular result. (Helfat, 2009). Marketing and technological capabilities are primary drivers of a firm's performance and thus of central interest to managers. Nevertheless, how these two capabilities align with changing environments to secure superior performance remains unclear.

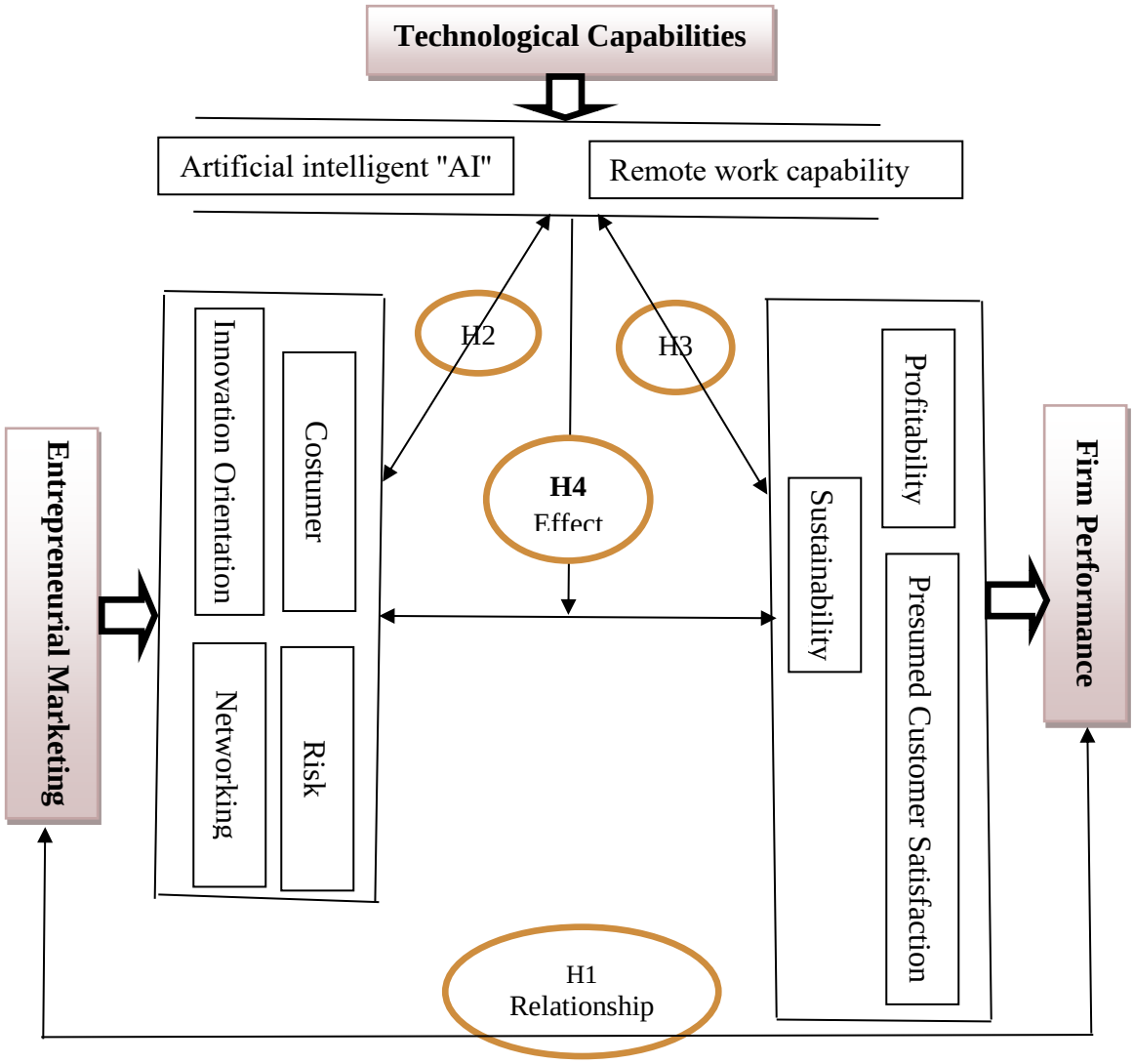
Thus, and according to the above discussion, the impacts of entrepreneurial marketing on firm performance may not directly be expected; however, within the moderating of technological capabilities where interaction will take place and the technological capabilities transform entrepreneurial marketing into outputs of created value. Thus, technological capabilities represent routines and processes that enable firms to utilize entrepreneurial marketing in firm performance. In other words, entrepreneurial marketing as a resource lead to technological capabilities which influence firm performance (Hamad, 2019). Resource-based view theory of the framework in this research is justifiable as explained before, it provides the theoretical base for understanding the effect of entrepreneurial marketing on technological capabilities and firm performance. Dynamic capability theory provides a base for understanding how technological capabilities can moderate the relationship between entrepreneurial marketing and firm performance.

Thus, the connection between marketing and entrepreneurship presents a challenge since there are too many heterocomplex, too many remote questionnaire studies with single interviewees, and too few qualitative studies according to the comprehensive review of the literature has given a general view of the concepts and variables used in the investigation of the correlation between entrepreneurial marketing EM & firm performance. Underpinned by the resource-based view, the study's conceptual model Figure (4) contained four hypothesized paths and 9 control variables. However, Figure (4) below presents the conceptual framework for this study which proposes links of entrepreneurial marketing to firm performance and the theoretical approach of this study proposes that technological capabilities as a moderating variable in the relationship between entrepreneurial marketing and firm performance.

2. The conceptual framework of the study

Figure 4 presents the conceptual framework for this study which proposes the links of entrepreneurial marketing to firm performance, the theoretical approach of this study proposes that technological capabilities as moderating variable in the relationship between entrepreneurial marketing and firm performance.

Figure 4 The conceptual framework of the study



Source: own creation based on qualitative-thematic analysis (2024)

3. 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.

3.1. The relationship between entrepreneurial marketing (EM) and firm performance (FP)

Recent literature highlights the complex interplay between (EM) and FP, emphasizing the dynamic and innovative nature of EM practices. Scholars underscore the proactive orientation of EM in creating value and identifying novel market opportunities (Hultman & Shaw, 2021). The dimensions of EM, such as customer focus, risk-taking, and resource leveraging, are explored in depth, with studies indicating their profound impact on diverse aspects of firm performance (Carr & Lopez, 2020; Matthysee, 2019). For instance, Carr and Lopez (2020) delve into the significance of customer-centric approaches within EM, revealing how a strong customer focus correlates with enhanced customer satisfaction and, consequently, improved financial performance.

Additionally, Matthysee (2019) emphasizes the role of risk-taking in entrepreneurial marketing, arguing that calculated risks contribute to innovation and differentiation, positively influencing a firm's competitive position. Resource leveraging, another key dimension, is explored by Ozkul and Yaprak (2018) who discuss how efficient management of resources, including time, money, and human capital, contributes to heightened firm performance. These studies collectively provide a comprehensive understanding of the nuanced mechanisms through which EM strategies influence and optimize various dimensions of firm performance in contemporary business landscapes. Entrepreneurial marketing is a dynamic concept that encourages firms to adopt an entrepreneurial mindset in their marketing strategies.

It involves characteristics such as resourcefulness, innovation, and a willingness to take calculated risks in identifying and exploiting market opportunities (Morris et al., 2002). The relationship between entrepreneurial marketing and firm performance has been the subject of extensive research. It is generally acknowledged that entrepreneurial marketing positively influences firm performance (Baker & Sinkula, 2019; Hult et al., (2008). Thus, based on the above discussions the following hypotheses are generated:

“H1: Entrepreneurial marketing impacts positively Firm performance”

3.2. The relationship between EM and TCPs

Entrepreneurial marketing refers to the proactive and innovative marketing strategies adopted by small and medium-sized enterprises (SMEs) to identify and exploit market opportunities. These strategies often involve creative problem-solving, customer-centric approaches, and agility in responding to changing market dynamics. The relationship between entrepreneurial marketing and technological capabilities is a dynamic and evolving area of research. Entrepreneurial marketing is characterized by the proactive and innovative marketing strategies employed by startups and small businesses to gain a competitive advantage. Technological capabilities, on the other hand, refer to a firm's ability to develop, implement, and leverage technology effectively.

Whatever, technological capabilities can provide startups and small businesses with the tools and platforms necessary for innovative marketing strategies. For instance, the use of digital marketing technologies, social media platforms, and data analytics can empower entrepreneurs to target their audience effectively and create unique marketing campaigns (Dholakia et al., 2010). Sun, & Lee, (2022) examines how entrepreneurial marketing efforts can enhance a firm's technological capability, particularly among small and medium-sized suppliers in South Korea's industrial sector. It suggests that entrepreneurial marketing practices, such as customer collaboration, market orientation, and agility in responding to market needs, can stimulate innovation and foster the development of technological capabilities within SMEs. Hence, the relationship between EM and TCP can lastly support my second hypothesis as follows:

“H2: Entrepreneurial marketing impacts positively on Technological capabilities”

3.3. The relationship between technological capabilities TCPs and firm performance FP

Over the past decade, firms' technological capability has been an essential strategic resource allowing them to achieve competitive advantage in their industry, especially in high-tech industries, for example, businesses with greater technological skills are more creative and are consequently performing at a high level. Those firms with superior technology capabilities can protect greater efficiency gains by developing process innovation and can make more distinctions in response to the changing business environment through innovative products.

In technologically competitive marketplaces, technological capability represents a significant potential source of competitive advantage and superior performance. Furthermore, technological capability helps a firm's ability to recognize and use new external knowledge to

continue competence development, which may lead to improved performance (Wang, et, al. 2006). Additionally, greater technological capability typically enables firms to create and offer innovative products or services in novel ways that customers appreciate, and so determines a company's overall and new product development performance.

Furthermore, José and Ortega, (2010) indicated technological capabilities improve the relationships between quality orientation and cost orientation respectively and performance. Thus, the stronger a firm's technological capabilities, the more simply it can integrate knowledge from beyond sources, and the greater are the opportunities that such knowledge will prove useful in creating innovative new products, Moreover, a firm with strong technological capabilities may welling to select trusting, capable partners who not only offer access to desirable resources, but also help the firm avoid technology leakage and opportunistic behavior, and innovation benefits of cooperating with a competitor should therefore be enhanced by a firm's strong technological capabilities (Wu, J. 2014). Consequences, Despite the conceptual attention dedicated to technological capabilities, scholars have paid less attention to the empirical analysis of its relationship with firm performance. Therefore, from the above arguments my study proposes that technological capabilities have a positive impact on firm performance Etemad, & Lee, 2001, Ortega, 2010).

"H3: Technological capabilities impact positively Firm performance."

3.4. The Moderating Role of TCPs in the relationship between EM and FP

The role of technological capabilities in moderating the effects between entrepreneurial marketing and firm performance has gained significant attention in the field of entrepreneurship and marketing. Technological capabilities refer to a firm's ability to utilize and leverage technology to create competitive advantages. Entrepreneurial marketing, on the other hand, focuses on the proactive and innovative marketing strategies and behaviors employed by entrepreneurs and small firms. The interaction between these two factors can significantly impact firm performance.

Technological capabilities refer to a firm's ability to harness and leverage technology-related resources to enhance competitive advantage (Teece, 2007). Firms with strong technological capabilities are better positioned to innovate, adapt to changing market conditions, and create value for customers. The literature highlights the pivotal role of technological capabilities in driving firm performance (Zahra & George, 2002; Helfat & Raubitschek, 2000). The interaction between

entrepreneurial marketing and technological capabilities is a topic of growing interest in research. Some studies have suggested that technological capabilities can moderate the relationship between entrepreneurial marketing and firm performance. For instance, (Kordestani et al. 2018) found that firms with strong technological capabilities can enhance the impact of entrepreneurial marketing on firm performance. They argue that technological capabilities enable firms to effectively implement innovative marketing strategies and capitalize on market opportunities.

However, the moderating effect of technological capabilities is not always straightforward. For instance, Gunday et al. (2011) contend that technological capabilities may weaken the relationship between entrepreneurial marketing and firm performance when firms face excessive internal complexity or inertia. In such cases, technology-related resources may not be effectively harnessed to support entrepreneurial marketing efforts.

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

Summary of the Chapter

This chapter presented the theoretical and conceptual framework that depends on previous studies to propose a direct relation between entrepreneurial marketing and firm performance and a direct relation between technological capabilities and firm performance, besides clarifying the moderating role of technological capabilities in the relationship between entrepreneurial marketing and firm performance. The following chapter illustrates the research methodology.

CHAPTER 4
RESEARCH METHODOLOGY

Introduction

In this chapter, a discussion of a general research design first, including a combination of qualitative and quantitative approaches, followed by, a discussion on the population of interest, sampling procedures, and sample-size, followed by the development of the questionnaire (study variable measurements). It also includes the methods used in collecting data, in analyzing the data, and in testing the hypotheses.

1. General research design

1.1. 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 and briefly I went over the numerous trustworthiness verification techniques. Thus, 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).

1.2. Second phase: quantitative approach

The objective of the quantitative phase is to examine the application of entrepreneurial marketing EM perceptions 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 variable. 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 (Abker, 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.

1.3. Population and sampling

One of the foundations of interpretive research is theoretical sampling, i.e., data gathering that is driven by concepts derived from the evolving theory, going to places, people, or events that will maximize opportunities to discover variations among concepts, (Martin, 2009). This research investigation focuses on various SME enterprises in which the entrepreneur is also a marketing expert. The population is defined as a "set of all objects such as people, events or things that interested researchers studied" (Sekran, 2006). Thus, the Population of this study includes all managers, employees, and entrepreneurs of SME firms located in Khartoum state-Sudan.

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.

1.4. Data collection instruments, process, and sample-size

1.4.1. 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 min. (see appendix 1). The strategy I have relied on in this methodology is to improve the questions in the scenario throughout the discussions respectively as well as modify 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.

1.4.2. 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

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

Own creation 2024

1.5. Measurement of variables

A variable is anything that can take on differing or varying values and these values can differ at various times for the same object or person, or at the same time for different objects or persons, there are three main types of variables: the independent variable (entrepreneurial marketing), The dependent variable (firm performance), and the moderating variable (technological capabilities). Measures for all dimensions of constructs were taken from the existing literature.

To measure the dimensions of variables, the study used the five-point Likert scale type scale ranging from strong agreement with the question to strong disagreement (Hamad, 2019, Sekaran, 2003). The Likert scale is designed to examine how strongly subjects agree or disagree with statements on a 5-point scale. Research indicates that a 5-point scale is just as good as any and that an increase from 5 to 7 or 9 points on a rating scale does not improve the reliability of the ratings (Sekaran, 2003). Therefore, the Likert 5-point scale is commonly used in most research. Moreover, the questionnaire items were adopted from different sources to suit the SM firms.

1.5.1. Measurement of entrepreneurial marketing (EM)

Entrepreneurial marketing is a "Proactive identification and exploration and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to the risk management, resource leveraging and value creation. (Rashad, 2018, Alqahtani & Uslay, 2020, Bandara et al., 2020, Tarigan et al., 2021, Majovski & Davitkovska, 2017, Nwankwo & Kanyangale, 2020). In this part of the study and based on the literature and the discussions of previous qualitative methodology I have adopted four main dimensions for the independent factor "Entrepreneurial marketing" to be addressed and investigated in SMs. These chosen dimensions were well-focused and most recommended by the participants throughout the discussions. The participants of discussions represent the study community consequently innovation orientation, customer intensity, risk management, and networking were the recommended and undertaken dimensions to be applied to SMEs operating in the Sudan market. The measurement items generated for each dimension are explained in the following:

1.5.1.1. Innovation orientation (IO)

The research uses various items considered reflecting the measurement of innovation orientation adopted by (Sadiku-Dushi et al., 2019; Bachmann et al. 2021). A five-point Likert scale has been used for the statements in table (6).

Table 6 Measurements for innovation orientation IO

No	Measurements
1	Being innovative is a competitive advantage for my company.
2	My company's top management creates an atmosphere that encourages creativity and innovativeness.
3	We invent new products and services and regularly uses new distribution channels.
4	We frequently utilize new opportunities in new markets.
5	Our unit regularly uses new distribution channels.

Own creation by researcher (2024)

1.5.1.2. Customer intensity (CI)

The research used five items considered to reflect the measurement of customer intensity adopted from (Sadiku-Dushi et al., 2019; Becherer, et al., 2012). A five-point Likert scale has been used to measure the statements in Table 7:

Table 7 Measurements for customer intensity CI

No	Measurements
1	Our business objectives are driven by customer satisfaction.
2	We pay close attention to after-sales service.
3	We ensure that business strategies in our company are driven by the goals of increasing customer value.
4	We make sure that our company's competitive advantage is based on understanding customers' needs.
5	We frequently measure our company's customer satisfaction.

Own creation by researcher (2024)

1.5.1.3. Risk management (RM)

The research used four items considered to reflect the measurement of risk-taking adopted by (Niemand et al., 2020; Bachmann et al., 2021, and the researcher 2024). A five-point Likert scale has been used to measure the statements in Table 8.

Table 8 Measurements for risk management RM

No	Measurements
1	My business would rather accept a risk to pursue an opportunity than miss it altogether.
2	My business is willing to take risks when we think it will benefit the company.
3	We encourage people in our company to take risks with new ideas.
4	We engage in risky investments (e.g., new employees, facilities, debt, stock options) to stimulate future growth.

Own creation by researcher (2024)

1.5.1.4. Network (Net)

I have developed the measurements of networking from Ritter et al., (2002). A five-point Likert scale has been used to measure the statements in Table 9.

Table 9 Measurements of Networking

No	Measurements
1	I encourage my employees to strive for innovative approaches to creating relationships with customers.
2	Overall, my firm is competent in dealing with inter-organizational relationships and networks.
3	In our firm we have a good relationship with each other and an important people in other firms.
4	We are experienced in dealing with technical partners.

Own creation by researcher (2023)

1.5.2. Measurements of Technological capabilities (TCPs)

Technological capabilities are defined as the ability to perform any relevant technical function or volume activity within the firm including the ability to develop new products and processes and to operate facilities effectively (Ortega, 2010).

During the discussions there was quite an interest from participants that the period epidemic Covid-19 that occurred in the world 2020, especially in Sudan has affected negatively the traditional or physical operation firms that needed attendance of employees, thus, the recommendations and suggestions of the discussion were about how to find out a solution and how to employ technology for a certain issue and similar crisis in future to assist in distance operation and to keep work stability.

Consequently, the dimensions chosen for the current study are to address the technologies uses skills, and capabilities and how firms encourage and train their employees to use technologies' tools and the internet as well to handle the job and duties wherever they are. this contains (Contact methods/techniques, tools/equipment, applications/websites-Language models). In this study, I attempt to encourage firms to develop and use up-to-date technologies to remain competitive in

the market and to perceive their market share among competitors. Thus, I have adopted two main elements for achieving these objectives, these dimensions are work remotely capability and artificial intelligence AI. The measurement items generated for each dimension are illustrated in the following:

1.5.2.1. Remote Work Capability (RWC)

The measurements have been modified by the researcher.

Table 10 Measurements for remote work capability (RWC)

No	Measurements
1	We have reliable internet connection at my remote work location.
2	Our company provide a type of devices for remote work (e.g., laptop, desktop, tablet)
3	We have access to the necessary software/tools for remote collaboration and communication (e.g., video conferencing, project management tools)
4	We have dedicated workspace at home for remote work.
5	How comfortable are you with verbal communication (phone, video calls) for work purposes?

Own creation by researcher (2024)

1.5.2.2. Artificial Intelligent (AI)

Measurements of I have been adopted from Baabdullah et al., (2021).

Table 11 Measurements for artificial intelligent (AI)

No	Measurements
1	Our organization employ AI technologies in the operation.
2	We have received enough information about the benefits of using AI technologies.
3	Using AI technologies will generate a high volume of sales and will increase our market share.
4	AI applications will strengthen our relationship and commitment to our business customers.

Own creation by researcher (2024)

1.5.3. Firm Performance (FP)

The concept of firm performance needs to be distinguished from the broader construct of organizational effectiveness. Firm performance is an important construct in strategic management research all around the world, and it is regularly employed as a dependent variable. “The term "firm performance" refers to a subset of organizational effectiveness that includes both operational and financial outcomes. The operational performance could be best viewed as an antecedent to financial performance, mediating the effect of resources, while customer satisfaction may be an antecedent to financial performance, is it not a performance outcome as well? This depends on how a researcher defines firm performance for his/her studies.

Based, on today’s highly competitive environment, organizations need to protect the long-term interests of customers” (Selvam et al., 2016). Hence, the adopted dimensions for this study in terms of FP have been chosen to assist SMs in Khartoum to satisfy their owner goals by maximizing their profit margins and at the same time to keep their operations stable in a very complex market environment through sustainability objectives. Being sustainable leads to improving various aspects in the internal and external environment and certainly improves society's empathy towards the firm, moreover, sustainability gives the firm a unique image and respectable reputation as well as optimizing its brand identity and market share. On the other hand, firms should improve their products and services to meet their customer/client needs and expectations. thus, our study concentrates on customer satisfaction as a core dimension of FP to be addressed in SMs in Khartoum and how firms meet their customers' needs or wants. The questionnaire of this component has been directed to the firm’s owners, managers, and employees. The questionnaire statements well answer the question of how firms acquire and retain their customers.

1.5.3.1. Firm Profitability (FP)

The measurements of firm profitability for this study have been adopted from Yee et al., (2008). The last two measure was generated by the researcher.

Table 12 Measurements for firm profitability

No	Measurements
1	Our company invest in return on assets as a main resource to maximize profitability.
2	Our company invest in return of sales as a main resource to maximize profitability.
3	Our company invest in return on investment as a key resource to maximize profitability.
4	Our company invest in numerous activities to maximize overall profitability.
5	Maximizing profitability of the firm encourages shareholder to expand the investments.

Own creation by researcher (2024)

1.5.3.2. Firm Sustainability (FS)

Three of the measurements have been adopted from Schrettle et al., (2014). And the last measure was generated by the researcher.

Table 13 Measurements for Sustainability

No	Measurements
1	We deploy new manufacturing technologies to make manufacturing processes more sustainable,
2	We give extraordinary importance to the development of green products
3	We give an attention the integration of green practices in the supply chain.
4	We regularly dispose of production waste to reduce environmental pollution.

Own creation by researcher (2024)

1.5.3.3. Presumed Customers satisfaction (PCS).

Measurement of customer satisfaction has been adopted from Yee et al., (2008). And Fourie, (2015).

Table 14 Measurements of presumed customers satisfaction. (PCS)

No	Measurements
	Our customers are satisfied with…
1	The price of their purchased product(s) in this company.
2	The enquiry service provided by this company.
3	The customer service in transactions.
4	The service of handling customer dissatisfaction in this company.
5	We analyze and respond to feedback and comments from customers.

Own creation by researcher (2024)

1.6. Development of The Questionnaire

In this research, the questionnaire method has been used as an instrument technique for gathering the primary data. A questionnaire is a reformulated written set of questions to which the respondent records the answers, usually within rather closely delineated alternatives. According to Sekeran, (2003) questionnaires are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variable of interest. The questionnaire was originally prepared and shared in the English language.

The survey questions were designed precisely to give clear ideas about the problems for the target respondents to answer. In this phase of the research, I used an online questionnaire as the main tool to collect the data from the respondents. The questionnaire for this study consisted of four main sections, (1) The demographical and firm data include "Age, Gender, Qualification, Position, Firm size, and Sector". (2) questions covered entrepreneurial marketing variables namely, (Innovation orientation, Customer intensity, Risk management, and Networking) (3) questions covered technological capabilities namely; (Remote work capability and Artificial intelligence) (4) questions covered firm performance variables namely; (Profitability, Sustainability, and Presumed customer satisfaction) Furthermore, I use a five–point scale as a unit of measurement ranging from "strongly disagree" to "strongly agree and worse to better for (quality and cost).

1.7. Pre-testing of the questionnaire and Cronbach's alpha reliability

The researcher used pre-testing for the questionnaire to ensure that the questions were understood by the respondents with no ambiguities, an exploratory sample of (31) service and

industry firms was selected, and there were no problems with the wording or measurement to eliminate confusing statements.

I have established my primary questionnaire and allocated it widely with the community of SMEs in Khartoum in the period between June and September 2023, the objective of collecting primary data is to analyze the "Pilot sample" to examine the reliability and internal consistency of my questionnaire. Consequently, I analyzed the pilot sample, and I got the overall result of alpha Cronbach for the whole research dimensions (0.94), which is considered an excellent estimation value of the research axis. Therefore, the instrument is considered to be of high reliability because the value of the reliability scale was close to one. Hair et al. (2010) defined reliability as an assessment of the degree of consistency between multiple measurements of a variable. This study assesses the consistency of the entire scale with Cronbach's alpha and its overall reliability of each factor of productivity values. All values generated alpha coefficient exceeded the values of 0.70 suggested by Hair et al., (2010). See Table 15 from this result of Cronbach's alpha coefficient value, this questionnaire was accepted and admissible. In short, it proved to be reliable.

Table 15 Explain the reliability coefficient of Cronbach's Alpha for the questionnaire items (sample size 31)

Nature of the factors	Dimensions	Number of items	Alpha Cronbach
Independent factor Entrepreneurial Marketing EM	Innovation orientation	8	.85
	Costumer intensity	6	.88
	Risk management	5	.78
	Network	4	.70
Moderating factor Technological Capabilities TCPs	Remote work capability	7	.75
	Artificial intelligence	6	.60
Dependent Factor Firm Performance FP	Profitability	5	.67
	Sustainability	6	.70
	Presumed customer satisfaction	5	.70
Overall reliability of the study measurements		**61**	**.94**

Own creation using SPSS (2024)

1.8. Data analysis techniques

The application of Statistical Package for Social Science (SPSS) version 23 and Analysis of Moments of Structure (SEM AMOS) version 25, as well as "Smart PLS 3" were used. The data analysis techniques used in this study are described below as following:

1.8.1. Descriptive statistics

Descriptive statistics are used to summarize and describe the key feature of the sample data such as frequency, percentage, means, standard deviations, and range. Measuring Customer-Based Brand Equity of Selected Television Channels in Addis Ababa: (Akuma, 2017). In this study, descriptive statistics were used to describe the SME firms in Sudan and respondents beside all the variables of the main four constructs that shaped the model of this study (entrepreneurial marketing, technological capabilities, and firm performance).

1.8.2. Reliability analysis

Reliability analysis was conducted to test the consistency and stability of the measurement instrument and help to assess the goodness of the measure (Hair et al., 2010). The internal consistency and stability can be determined by the coefficient value of Cronbach's alpha. The closer Cronbach's alpha is to (1.0) the higher the internal consistency reliability while Cronbach's alpha of less than (0.6) is generally considered as poor, and (0.70) is considered to be acceptable, and those higher than (0.80) are to be good (Serkan, 2003). Therefore, in this study reliability analysis was done on all study variables.

1.8.3. Principle component analysis PCA

Principal Component Analysis (PCA) being the most employed method, according to (Hair et al. 2019). PCA primarily serves as a means of reducing dimensionality, transforming the original variables into a smaller set of uncorrelated variables known as principal components.

1.8.4. Correlation analysis

Correlation analysis has been used to establish a correlation matrix between study variables. The correlation coefficients of (0.10, 0.30, and 0.50), irrespective of sign, are interpreted

as low, medium, and strong respectively (Hair et al., 2010). In this study person correlation was used to find the degrees of correlation between the main variables. That is to determine the relationship between entrepreneurial marketing and firm performance, and the moderating effect of technological capabilities between entrepreneurial marketing and firm performance.

1.8.5. Path analysis

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".

1.8.6. ANOVA analysis

The Independent T test ANOVA was utilized to investigate the significant effect of the characteristics of the firm (Sector and Firm size) on entrepreneurial marketing, technological capabilities, and firm Performance.

Summary of the chapter

This chapter discusses the general research design described, followed by the justification for choosing the SMEs as the research targeted population. After that, a discussion on the interested population, sampling procedures, survey design and survey method are explained. Moreover, it includes a discussion on the modification of scale items and an explanation of the different measurement scales being used followed by questionnaire design. Finally described the methods used in collecting and analyzing data and testing the hypotheses.

CHAPTER 5
DATA ANALYSIS AND FINDINGS

Introduction

This chapter shows the process through which the data that was collected from SME firms in Sudan was analyzed to present the findings. The chapter was organized into two main parts: Firstly: Qualitative methodology divided into three suctions as following (Data analysis process and criteria, thematic analysis, and the result of thematic analysis). Secondly: Quantitative methodology contains three sections. The first section includes data cleaning, factor loading, missing data, unengaged responses, outliers, frequencies of SMEs and respondents, and reliability analysis. the second section is the goodness of the measure to shows the descriptive analysis of the study variables includes principal component analysis PCA, Correlation, and Independent T test analysis (ANOVA). The last section focuses on the results of path analysis and hypothesis testing.

1. Firstly: Qualitative methodology

1.1. Data analysis process

Thematic analysis has used because of its ability to provide useful perspectives to capture additional dimensions for the study in helping, confirm theories and develop the pre-model to explain certain phenomena. Meanwhile, the inductive approach has been applied because of its ability to offer flexibility and the Let-it-flow approach to provide some novelty for the research.

Thematic analysis was conducted to create an in-depth analysis to recognize the specific themes researched during the discussions. Furthermore, I utilized thematic analysis, as a method for identifying, analyzing, and interpreting patterns within data, to examine the data that was gathered (Nouri, et al. 2018).

Following the six phases of thematic analysis, I employed Clarke and Braun's (2013) approach as following:

I. Familiarization with the data: I thoroughly investigated the data collected from discussions from entrepreneurs. This was accomplished by repeatedly evaluating the data that had been acquired. Thus, I was able to become as familiar with the data as feasible by repeatedly listening to the recorded data and writing down the recorded discussions.

II. Coding: I have created an initial coding list for the main and intersections dimensions.

III. Searching for themes: Building themes and gathering all the coded data relevant to each sub-theme involved an active process that I engaged in.

IV. Reviewing themes: I considered if the created themes provide a compelling and convincing narrative regarding the collected data. This was a crucial stage in building the underlying themes.

V. Defining and naming themes: Each theme was thoroughly examined, and the "essence" of each was determined. I then created a clear and informative name for each theme.

VI. Writing up: To provide the reader a coherent and persuasive narrative about the data, I finally integrated the analytic narrative and data extracts together.

1.2. Thematic analysis

1.2.1. First theme: Entrepreneurial marketing (EM)

- What are the factors/dimensions that come to your mind when you hear about entrepreneurial marketing?

The first question has been designed to assist the researcher in exploring and investigating in depth the boundaries of "EM." Thus, most of the respondents started their speech that when it comes to the EM aspect you should consider innovative thinking to generate and promote new ideas, products, processes, or new services to be implemented in the market. This finding is in line with some previous studies (Crick, et al. 2020, Whalen, et al. 2016). And here some quates of the discussions

{"It's a way of your thinking first of all, thinking innovatively. This is the main aspect for entrepreneurial marketing. Yeah, the very most important word is innovation. You implement innovation in your marketing, even in the marketing disciplines and even in the entrepreneurship." (Mini-FGD, female 1)}.

Likewise, another participant has given quite interesting questions about EM, she thought about new and innovative ideas regarding the problems that may face entrepreneur and how it helps them to solve them and to enhance people life. And another participant has also explained that new ideas or what I can call innovation is the first aspect of EM and this can help produce new platforms and bring excellent achievements for the firm.

{"*The first aspect is supposed to be new ideas in the field of marketing so that we can produce a new platform or pursue a strategy and achieve excellence for the company." (3rd Interview, Male)}.*

One of the participants has contributed that EM has connection with blue ocean whereas entrepreneurs always seek to invest in a market where there are no competitors or entering a new market to cover or to fulfill utilizing a specific methods or strategy.

{"If I may contribute, I think entrepreneurial marketing is more related to the Blue Ocean investments. Where we consider all entrepreneurs are only investing in the areas that's not actually covered by other businessmen or other investors. Then they will need specific marketing tactics so they can survive in their Blue Oceans before the competition join them." (Mini-FGDs, Male)}.

On the other hand, I observed that one of the participants has come up with a new dimension for EM which is "Segmentation" she has asked the following question how to segment various fields to distribute and contribute the firm's products and services?

{"*The second idea is on what context do they segment the market? The segmentation processes. Before we found a product or a service, we assigned a certain segment in the market to be served by our service or product. What are the criteria that will be, and this depends on what is the area we are going to contribute our product or service? Is it an education or health or social context or even industry?" (Mini-FGDs, Female 2)}.*

The first participant has Clearfield his view by saying: although they encounter numerous uncertainties and difficulties along the way, entrepreneurs must be flexible and ready to adjust to shifting market conditions. By this sense he also came up with the main dimension of EM which is (Customer intensity) saying that entrepreneurs are skilled at listening to their consumers and acting on their input. Entrepreneurial marketing is all about understanding and meeting client needs.

{"Agility: Entrepreneurs need to be agile and adaptable to changing market conditions, as they face many uncertainties and challenges along the way.
Customer Focus: Entrepreneurial marketing is all about identifying and satisfying customer needs, and entrepreneurs are adept at listening to their customers and responding to their feedback." (2nd Mini-FGDs, Male 1)}

Likewise, the second respondent has stated and confirm the core two elements of EM he said that entrepreneurial marketing implies introducing fresh, cutting-edge goods or services to the

marketplace, which calls for both innovation and creativity. And he added to his speech saying that (Taking risk) is a key component of entrepreneurial marketing, therefore entrepreneurs are recognized for taking risks and are frequently prepared to invest in novel and unproven concepts. *{"Innovation and Creativity: Entrepreneurial marketing involves bringing new and innovative products or services to the market, which requires creativity and innovation. Risk-taking: Entrepreneurs are known for taking risks and are often willing to invest in new and unproven ideas, which is an important dimension of entrepreneurial marketing." (2nd Mini-FGDs, Male 2)}*

Based on the literature I mentioned earlier that (leveraging recourse) is the main dimension for EM. The participant has also come up with the same view saying: entrepreneurs must manage their resources, including time, money, and human capital, effectively and efficiently. Participant added (Networking) as a new term for EM and she discussed that networking is important for entrepreneurs to expand their businesses and find success, entrepreneurs must have a strong network of partners and contacts.

{"Resource leveraging: Entrepreneurs need to be efficient and effective in managing their resources, including time, money, and human capital. Networking: Entrepreneurs need to create a strong network of connections and partners to help them grow their business and accomplish success." (2ndMini-FGDs, Female)}.

In order to examine the feasibility of customer intensity and leveraging resource I found that all the participants have come together and approved that customer intensity is more important and more feasibility for SMEs, one of the participants described in detail that the main focus for any firm is firm-based customers and to fulfill their needs, wants, and desires. And how to manage and leverage your resources to meet customer or client expectations. Likewise, another participant has also explained why customer intensity is needed for the firm? because a customer is the center of every successful firm that works innovatively to create or deliver products or services to satisfy their needs and wants.

Following some opinion's quotation respectively:

{"*As a marketing specialist, the first step we start with and go forward is the customer. Without the customer, there is no product, there is no market, there's no anything. What your customer need and then think about how to leverage your resources to meet the needs of the customer and to make profit at the same time". (Mini-FGDs, Female 2)}.*

{*"I think customer intensity because I think when you become a customer center, I think you will be more effective than other way of marketing. Because sometimes when we talk about entrepreneurship that creative or innovative way in doing business, or creative way of creating products or services you offer, unless it satisfies the customer needs, I think it will not succeed." (Mutual Interview, Female 2)}.*

Based the literature an according to Rashad, (2018) proactive identification considers one of the EM core dimensions, this view has come together with what the participant has said in this discussion.

{"I am thinking entrepreneurial marketing is about proactive. So, I think this will be the main factor. So, I'm not sure about definite factors, but this is what comes to my mind." (Mutual Interview, Female 2)}.

I can summarize that a participant has stated that SMEs should scale, enhance, or optimize the resources they have to avoid the market challenges and to keep their work process in continual volume and this will lead you to understand and optimize your budget boundaries.

{*"So, for me, the major factors for that would be the resources, the scale. Because when we talk about small and medium sized enterprises, that becomes sometimes a challenge because maybe you don't have the capacity to have a full team running your marketing. So, you need to think about how you optimize the resources you have and how you can scale it without maybe the need of hiring more people". (1st Interview, female)}.*

One of the main contributions that I have gained is that one of the Participants has added risk-taking as a dimension of EM, she argued that the SM projects are facing many threats during their establishment stages and along with their durability in the market, thus, managing this threats and risks can remind you to be unique from competitors.

{"*In entrepreneurial marketing, I see the importance of taking risks as long as you have opportunities, as long as they are small projects, you can see the risks to be unique from competitors outside the framework". (2nd Interview, Female)}.*

According to the FGDs, this time all participants has come up with an additional dimension "Value creation" which is initially consider core dimension according to the literature see (Sadiku-Dushi, et al. 2019, Becherer, et al. 2012). they clarified that every firm should offer a specific value to be transferred to the customers.

{"Also, a good factor that you should bring with you is a value creation that your business should have a value to represent". (FGDs, Female2)}.

{"In my opinion when you are entering a new market, or you are entering a new business as an entrepreneur I think one of the most important think that you need to know about how to sell your product and also you need to know your target market and the value that you will provide to your costumers" (FGDs, Male 2)}.

Based on the same question, I found two interviewees have explained that EM is based on opportunities and how you can get the advantage of it and the entrepreneur should be skillful to create new opportunities.

{"The second thing is how can we take advantage of opportunities in modern fields, especially through the process of marketing and change, and relying on quality. It can be according to the skills. These can be the foundations." (3rd Interview, M)}.

Based on the ongoing development for the scenario question consequences, the following are some potential advantages and benefits generated throughout the discussion for each of these three dimensions:

Customer Intensity:

{"I believe that Customer Intensity can rapidly increase customer loyalty and retention and can assist in positive word-of-mouth referrals and PR." (2nd Mini-FGDs, Male 1)}.

{"For me as a customer representative this dimension improve customer satisfaction and NPS scores." (2nd Mini-FGDs, Female)}.

According to my experience in the firm focusing on customer could help to reach higher revenue and profits due to repeat business and cross-selling opportunities this can assist also to get more accurate customer personas and targeted marketing." (2nd Mini-FGDs, Male 2)}.

Focusing on Opportunities:

I think it increase innovation and agility in response to market changes and can explore new idea and new market." (2nd Mini-FGDs, Female)}.

For me focusing on opportunity can improve scalability and diversification of products or services. (2nd Mini-FGDs, Male 2)}.

I think there are many benefits for focusing on opportunity I can mention for example Improve competitiveness and market share, higher rate of ROI, profitability, enhance reputation and brand image. (2nd Mini-FGDs, Male 1)}.

Risk Management:

{"I think managing any risk for the firm can minimizing potential losses or damages to the company, moreover, can represent a protection of company assets and resources." (2nd Mini-FGDs, Male 1)}.

{"Risk management in the firm is important to Improve compliance with legal and regulatory requirements also a creation of a more stable and predictable business environment." (2nd Mini-FGDs, Male 2)}.

{"I believe that managing risk can provide a heighten confidence and trust of stakeholders, investors, and customers." (2nd Mini-FGDs, Female)}.

Overall, each of these measures can support a business in thriving and succeeding in its sector. A corporation can develop a more sustainable business model and lay a better foundation for long-term growth and profitability by modifying consumer intensity, focusing on opportunities, and managing risks effectively.

1.2.2. Second Theme: Technological capabilities (TCPs)

- Do you think that technological capabilities can play the moderator role between entrepreneurial marketing and film performance? If yes, why do you think it is important?

Throughout the discussions, I have observed that all participants unanimously agreed that TCPs are important to play the moderating role between entrepreneurial marketing and firm performance, one of the participants said it is important to control and likely to make a positive impact on the relationship between two factors. while another participant has compromised that TCPs can play a moderating role since it is based on innovation when it comes to EM.

Likewise, a third participant has said that utilizing TCPs is highly essential for SMEs which helps you to optimize the firm performance and assist you to achieve your work efficiently instead of doing it manually. It can also help measure the firms track and standardize the firm process as well. Following some quotations from the discussions:

{"*it's highly important because maybe something I mentioned in the first point is when you have limited resources because of the scale of the business and the corporate year and even it's important in a corporate level, but for SMEs, it's highly important that you would know what you are doing and how it's performing for you". (1st Interview, Female)*

{"I think technology and co-innovation can help the firm so you can come up with technology solution and its benefits you so you can grow up and evaluate and develop your firm process, and this will lead you to efficiency in the work in the outputs and so on therefore, TCPs is very beneficial" (FGDs, Female 2)}.

{"Definitely yes, using technology, gathering data or information will be easy to sort them out, analyzing them in the basic stages, it will be more accurate and easier than the traditional way" (Mini-FGDs, Female 2)}.

{"Based on my knowledge, I think that technological capabilities can play a moderate role in linking entrepreneurial marketing with firm performance. Because technological capabilities can help firms to develop new products, enhance existing ones, and improve processes, which can result in increased performance. Entrepreneurial marketing, on the other hand, can help firms to identify new market opportunities and create customer value. Therefore, combining these two factors through technological capabilities can lead to better firm performance." (2nd Mini-FGDs, Male 1)}. {"I agree, because TCPs are important to explore and utilize new models and new opportunities for the firm." (2nd Mini-FGDs, Female)}.

- If you had to pick one factor which is most important to you, what is the other dimensions of TCPs you think can give best interactions and effectiveness beside innovation.

By asking this question I intend to investigate, generate, and explore more dimensions of TCPs that can assist extend adaptation from the new dimensions. Thus, a respondent explained that utilizing technology in business can provide more security to keep your resources and information safe and away from your competitors.

{"*Other factors like security and maybe enjoyment and the risk you can face if you are using a technology" (Mutual Interview, Female 2)}.*

Another participant addressed about how to be skillful and can do a job and work wherever you are, and this argument I can see how it was efficient in real practice during the COVID-19 period. Therefore, it considers as technologies transformation to keep works constantly.

{"*the ability to work remotely so you can optimize like the resources you have, so you get the best of the best. You're not limited to a geographical limit. So, technology starts with the equipment that helps you and the software that help you optimize whatever job you're doing" (1st Interview, Female)}.*

With the same line, another respondent has assumed that communicating technologically can be one of TCPs dimensions because periodically you need to keep in contact with your customer to know his extended needs and wants.

{*"Communication. Because we are talking about the technological aspect, whenever he is in contact with the customer and knows the extent of his needs, this affects entrepreneurial marketing. According to what we are talking about small companies." (2nd Interview, Female)}.*

I have also obtained a new dimension for TCPs throughout FGDs. 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.

{"Maybe the use of artificial intelligent (AI) will gives you good intensity, good interactions specially we are come up with the technology in everything." (FGDs, Female 2)}.

{"I can contribute that Research and Development Capability: This dimension focuses on an organization's ability to develop new technologies and improve existing ones through research and development activities. Also, Technological Acquisition: This dimension focuses on an organization's ability to acquire external technologies through partnerships, licensing, or unions and purchases." (2nd Mini-FGDs, Female)}.

{"I think the other dimensions for TCPs are the ability of an organization to generate new business models that take advantage of technical advancements and add value for consumers and shareholders. Other dimensions can be the ability of the firm to quickly adjust to shifting market conditions, customer wants, and technology improvements by saying the focus of the agility and flexibility dimension." (Mini-FGDs, Male 1)}.

1.2.3. Third theme: Firm performance (FP)

- What are the main dimensions or measurements of the firm performance that you can suggest being adapted by this study?

In this context I designed to explore in depth the FP elements, Thus, most of the participants have agreed that financial performance is most important measurement that firms strive to achieve, and this can help firms evaluate their progress and the proceed levels they reached in certain time.
{*"I think when we had to measure his performance. I think the most important one or the most important factor is the financial performance. Because this the only way he can measure is not the only way or maybe the important one in measuring his success as a new or established company or firm. So, I think the financial performance will be the factor". (Mutual Interview, Female 2)}.*
{"One of the most important measurements is financial performance this includes metrics such as revenue, profit, return on investment (ROI), and shareholder value. The second important measurement is: Customer satisfaction this measure shows how well the company meets the needs and expectations of its customers." (2nd Mini-FGDs, Male 2)}.
{"I think Operational efficiency: This let the firm to know the effectiveness and efficiency of internal processes and operations. I can also add employee satisfaction: This can measure how satisfied and engaged employees are with their work and the company." (Mini-FGDs, Female)}.

- Based on the previous discussion I have developed the questions sicario to adopt revenue and sustainability as a measurement for FP, one of the participants has agreed that revenue and sustainability can be an appropriate measurement for FP.

{*"I think yes because as I said before revenue or profits one of the business establishment reasons. And obviously this business logic will be followed by sustainability in order to keep growth and to preserve a reliable market share among competitors. This can lastly extend the firm's life cycle." (FGDs, M1)}.*

Whereas two of respondent has accepted revenue to be adopted by SMEs in Sudan but in terms of sustainability they do not feel the same way.
{*"Absolutely, specially here in Sudan if you are not generating revenue first of all you cannot be sustain in the market by the way, the sustainability related to revenue here in Sudan. If you do not get a revenue, you cannot sustain in the market and you fail so I think it's an important dimension for measuring FP." (FGDs, Male 2)}.*

One of the participants has argued that sustainability is not an appropriate measurement for SMEs due to their small operations and they are still in the risk line, so they are not aware of being sustained as a large company.

{"Actually, sustainability I do not think can be an appropriate dimension for SME due to their small enterprise, but revenue maybe an appropriate dimension for measuring FP defiantly it will be." (FGDs, Female2)}.

Furthermore, one of the respondents have indicated that growth can be one of the FP measurements because every entrepreneur spends some expenses and invest in growing his firm in the future.

{"*I think if I can express myself well, I think the growth that they are. Because sometimes he can invest his returns on in growing his company". (Mutual Interview, Female 2)}.*

The other dimension that has been generated throughout the discussions is customer satisfaction. In this context more than two participants have accepted that customer satisfaction can be an accurate measurement for FP, they expressed that any business opposed to getting a considerable market share among competitors, this logic can be achieved by beginning with customer acquisition and customer retention to keep them for a long term and then gain their loyalty for a firm.

{"*It starts with customer acquisition because that's the main goal of any business that that needs to be tracked with the right tools as well. Customer retention. How long is the customer staying with you and why they're leaving if in case they left, then you mean here customer satisfaction. Yeah, it's a work as customer satisfaction as well". {"the second measurement should be satisfaction in the two sides in the costumer side and in the employee side and this all will complete the picture of your vision." (FGDs, Female 2)}.*

1.2.4. Summary of thematic analysis

Table 16 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
					Operational efficiency
					Employee satisfaction
	Proactiveness identification		Artificial intelligent "AI"		
	Leveraging resource		Research and Development Capability R&D		
	Risk management		Technological Acquisition		
	Value creation		New business models		
	Agility		Agility and Flexibility		
	Networking				

Own creation, based on thematic analysis (2024).

2. Secondly: Quantitative methodology

2.1. Data preparation

2.1.1. Missing values

Handling missing data is crucial in any data analysis scenario. In this case, the survey link through Google Docs is set up to prevent submissions unless the questionnaire is fully completed. Therefore, no specific treatment for missing data has been applied.

2.1.2. Outliers

Outliers are data points that stand out from the rest due to their significant numerical distance, and they can occur randomly in any distribution (Awang, 2014). Pallant (2013) suggests that in large sample sizes, encountering a small number of outliers is typical, and their influence can often be disregarded. However, the presence of an outlier could signal issues such as faulty data, errors in procedures, or areas where a particular theory may not hold true. In this study, Mahala Nobis Distance (D-squared) was used to identify outliers, measuring the deviation between case scores and the sample. High D-squared/df values above 3.5 indicate potential outliers (Byrne ,2013). Analysis revealed no multivariate outliers among the cases, as the maximum D2/df ratio was well below the threshold. All observations were retained for further analysis.

2.1.3. Normality

Examining the normality of data serves as an essential initial stage in any statistical analysis (Hair et al., 2019). Specifically, all constructs underwent a normality test as part of the statistical assumption procedure. According to Byrne (2013), data adheres to a normal distribution when its Skewness value falls between -2 and 2, and its kurtosis value lies within the range of -7 to 7.

In this study, Skewness values ranged from -1.040 to +0.266, while kurtosis values for the constructs ranged from -1.040 to +1.732, as illustrated in Table 17. Consequently, the normality assumption was satisfied, rendering all constructs in this study deemed reasonable and acceptable.

Table 17: Assessment of Normality

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
CI1	255	-.909	.153	-.149	.304
IO1	255	-.759	.153	.863	.304
Net3	255	-.437	.153	-.398	.304
CI4	255	-.855	.153	.255	.304
Net1	255	-1.101	.153	1.732	.304
CI2	255	-.706	.153	-.068	.304
CI5	255	-1.040	.153	.937	.304
Net4	255	-.732	.153	.119	.304
IO3	255	-.206	.153	-1.040	.304
RM1	255	-.532	.153	-.106	.304
RM2	255	-.322	.153	-.610	.304
IO2	255	-.994	.153	1.087	.304
IO4	255	-.699	.153	-.086	.304
IO5	255	-.922	.153	-.015	.304
RWC1	255	-.826	.153	.496	.304
RWC2	255	-.623	.153	-.419	.304
RWC3	255	-.361	.153	-.688	.304
AI1	255	-.682	.153	.197	.304
AI3	255	-.770	.153	.655	.304
AI5	255	-.877	.153	.641	.304
Su4	255	-.975	.153	.327	.304
PCS2	255	-.497	.153	-.402	.304
PCS5	255	-.380	.153	-.351	.304
P1	255	-.309	.153	-.940	.304
P5	255	-.844	.153	-.024	.304
Su3	255	.266	.153	-.755	.304
PCS1	255	-.205	.153	-.810	.304
PCS3	255	-.346	.153	-.465	.304
PCS4	255	-.532	.153	-.463	.304

2.2. Unengaged responses

Table 18: Unengaged responses

Total Questionnaires	255
Unengaged responses	9
Unengaged responses Rate	3%

Own creation by researcher (2024)

2.3. 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 19: 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**

Own creation by researcher (2024)

2.4. Goodness of measures

This section reports the results of validity and reliability tests as a means to assess the goodness of measure in this study constructs (Sekaran, 2003). The study used Principal Component Analysis (PCA) The following is the detailed information of (PCA).

2.5. Exploratory Factor Analysis: Utilizing (PCA)

The evaluation of the construct validity of the scales involved assessing the Kaiser-Meyer-Olkin (KMO) coefficient and conducting the Bartlett Sphericity test, which determined the necessity of employing factor analysis (Hair et al., 2019). Exploratory Factor Analysis (EFA) was then utilized to examine the validity structure of the scale. Within the implementation of EFA, various techniques can be utilized for factor extraction, with ***Principal Component Analysis (PCA)*** being the most employed method, according to Hair et al. (2019). PCA primarily serves as a means of reducing dimensionality, transforming the original variables into a smaller set of uncorrelated variables known as principal components.

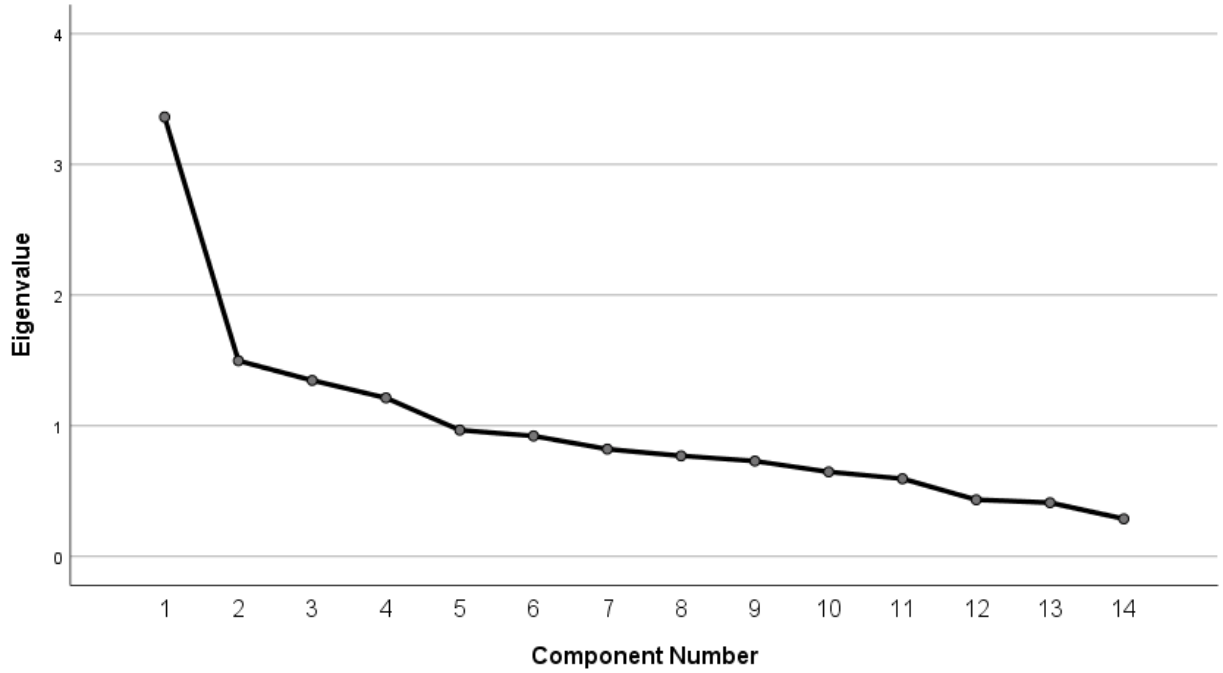
This process facilitates simplifying the data structure and identifying underlying factors, as emphasized by Abdi and Williams (2010). Additionally, ***Factor rotation*** was employed in EFA to determine variable groupings, with Varimax rotation being a widely used method. Varimax rotation is considered an orthogonal rotation technique aimed at maximizing the variance of squared loadings within each factor while ensuring distinct loadings for each variable, as elucidated by Tabachnick, et al., (2007).

2.5.1. Entrepreneurial marketing dimensions (Independent variable)

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test were used to find out about the suitability and accuracy of factors within a provided sample (Hair et al., 2019). The results presented in table 5.4 show that KMO = 0.686, Bartlett test value $\chi 2 = 673.7$, p= .000. To conduct item factor analysis, it is recommended to ensure a Kaiser-Meyer-Olkin (KMO) value of at least 0.50. Additionally, it is crucial for the Bartlett test to yield significant results, as indicated by Abdi and Williams (2010). The results obtained from the scale indicate the suitability of the data for factor analysis.

The factor analysis employed ***principal components analysis*** and varimax vertical rotation to eliminate items with factor loading values below .30, as well as items with loading values across different factors, as outlined by Abdi and Williams (2010). Hence, 4 items were excluded from the measurement since they were not determinative of which factor is measured.

Figure 6 scree plot of Entrepreneurial marketing dimensions



Own creation by researcher (2024)

Based on the analysis conducted using principal components analysis and Varimax rotation, four factors were identified, each with eigenvalues exceeding 1 as it seen in figure 6. The results presented in table 21 show these factors explain a cumulative variance of 52.99%, with the first factor explaining 24.01%, the second 10.69%, the third 9.61%, and the fourth 8.66%. This suggests that the identified factors account for a significant portion of the variance within the scale. Further examination reveals that out of the 14 items on the scale, 5 items align with the first factor, while 3 items align with each of the remaining three factors. This distribution of items across factors provides insight into the underlying structure of the scale and helps in understanding the dimensions it measures.

Additionally, the factor loadings of all items fall within the range of 0.761 to 0.305, indicating their contribution to the respective factors. Moreover, all items exhibit Item-total Correlation Coefficients above 0.30, indicating their discriminative power in assessing the constructs measured by the scale. Overall, the findings suggest a robust four-factor structure consisting of 14 items, with each factor capturing distinct dimensions of entrepreneurial marketing.

The high Item-total Correlation Coefficients further validate the reliability and validity of the scale in assessing the intended constructs.

Table 20 EFA utilizing (PCA) for Entrepreneurial marketing EM dimensions.

Items	**Scale Item No**	**Factor Loading Values**			
		Factor 1	Factor 2	Factor 3	Factor 4
CI1	1	.761			
IO1	2	.761			
CI4	3	.664			
Net3	4	.658			
Net1	5	.493			
CI5	6		.766		
Net4	7		.666		
CI2	8		.516		
IO3	9			.824	
RM1	10			.545	
RM2	11			.443	
IO2	12				.747
IO5	13				.718
IO4	14				.305
Variance (%)		24.01%	10.69%	9.61%	8.66%
Total Variance		52.99%			
KMO		.684			
Bartlett test value $\chi 2$		673.7			
Bartlett's test of p-value		0.000			

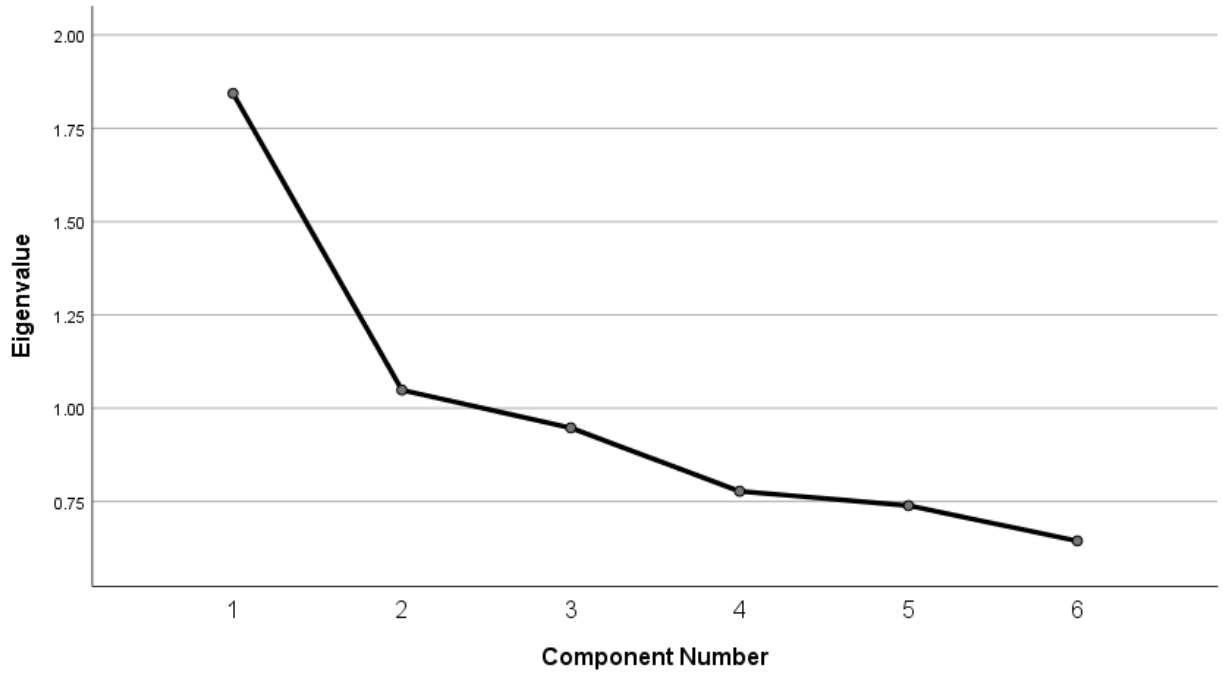
Own creation by researcher (2024)

2.5.2. Technological capabilities dimensions (Moderator variable)

The findings presented in Table 22 demonstrate that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.665, indicating a moderate level of suitability for factor analysis. Additionally, the Bartlett test yielded a significant result with a chi-square value of 97.7 and a p-value of .000, further supporting the appropriateness of the data for factor analysis.

For the factor analysis procedure, principal components analysis was utilized in conjunction with varimax rotation to enhance interpretability by maximizing the variance of factor loadings. Items with factor loading values below .30 were excluded, as were items exhibiting loadings across multiple factors. Consequently, four items were removed from the measurement scale due to their inability to distinctly represent a particular factor.

Figure 7 scree plot of Technological capabilities dimension



Own creation by researcher (2024)

Based on the analysis conducted using principal components analysis and Varimax rotation, two factors were identified, each with eigenvalues exceeding 1 as shown in Figure 7. These factors account for a cumulative variance of 48.2%, with the first factor explaining 30.72%

and the second 17.47% as shown in table 22. This indicates that the identified factors explain a significant portion of the variance within the scale. Further examination reveals that out of the 6 items on the scale, 3 items align with each factor. This distribution of items across factors provides insight into the underlying structure of the scale and helps in understanding the dimensions it measures. Additionally, the factor loadings of all items fall within the range of 0.816 to 0.568, indicating their contribution to the respective factor.

Moreover, all items exhibit Item-total Correlation Coefficients above 0.30, suggesting their discriminative power in assessing the constructs measured by the scale. Overall, the findings suggest a robust two-factor structure consisting of 6 items, with each factor capturing distinct dimensions of technological capabilities.

Table 21: EFA utilizing (PCA) for Technological capabilities dimensions.

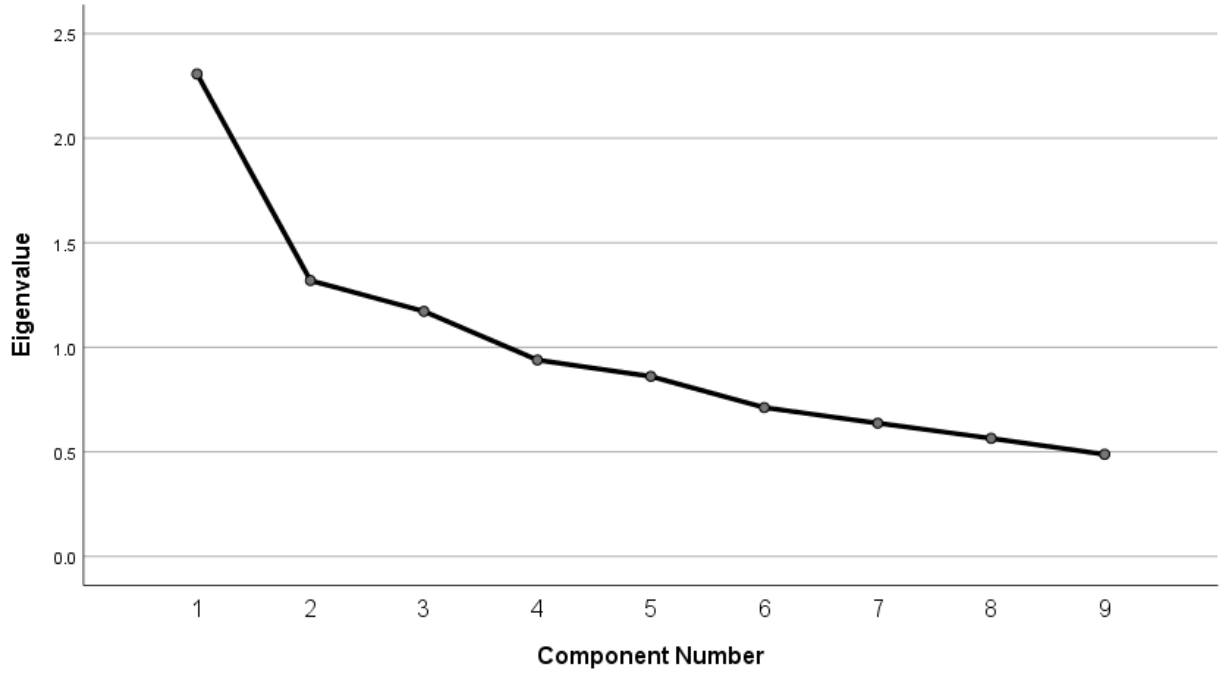
Items	**Scale Item No**	**Factor Loading Values**	
		Factor 1	Factor 2
RWC1	1	.816	
RWC2	2	.599	
RWC3	3	.583	
AI1	4		.802
AI5	5		.627
AI3	6		.568
Variance (%)		30.72%	17.47%
Total Variance		48.20%	
KMO		.665	
Bartlett test value $\chi 2$		97.70	
Bartlett's test of p-value		0.000	

Own creation by researcher (2024)

2.5.3. Firm Performance FP dimensions (Dependent variable)

The findings presented in Table 23 demonstrate that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.662, indicating a moderate level of suitability for factor analysis. Additionally, the Bartlett test yielded a significant result with a chi-square value of 255.23 and a p-value of .000, further supporting the appropriateness of the data for factor analysis. Consequently, 5 items were removed from the measurement scale due to their inability to distinctly represent a particular factor.

Figure 8 scree plot of Firm Performance FP dimensions



Own creation by researcher (2024)

Based on the analysis conducted using principal components analysis and Varimax rotation, a three-factor structure was identified for assessing Firm Performance. These factors collectively account for a significant portion (53.31%) of the variance within the scale. The first factor explains 25.63% of the variance, the second factor 14.65%, and the third factor 13.03%.

Further examination reveals that out of the 9 items on the scale, 3 items align with each factor. This distribution provides insight into the underlying structure of the scale and helps in

understanding the dimensions it measures. Additionally, the factor loadings of all items fall within the range of 0.736 - 0.436, indicating their contribution to their respective factors. Moreover, all items exhibit Item-total Correlation Coefficients above 0.30, indicating their discriminative power in assessing the constructs measured by the scale. Overall, these findings suggest a robust three-factor structure consisting of 9 items, with each factor capturing distinct dimensions of Firm Performance.

Table 22: EFA utilizing (PCA) for Firm Performance FP dimensions

Items	**Scale Item No**	**Factor Loading Values**		
		Factor 1	Factor 2	Factor 3
PCS5	1	.736		
PCS2	2	.709		
Su4	3	.666		
Su3	4		.693	
P5	5		.691	
P1	6		.597	
PCS4	7			.436
PCS1	8			.766
PCS3	9			.679
Variance (%)		25.63%	14.65%	13.02%
Total Variance		53.31%		
KMO		.662		
Bartlett test value $\chi 2$		255.23		
Bartlett's test of p-value		0.000		

Own creation by researcher (2024)

2.6. Distribution of Measurements

Following the execution of principal component analysis and rotation matrix, numerous items within the original questionnaire were omitted due to their lack of statistical significance, while several items underwent rotation across dimensions to better align with the underlying factor structure. Subsequently, I have conducted correlation matrix analysis, ANOVA, and path analysis to further explore the relationships among variables, assess group differences, and elucidate the causal pathways within the study model.

Table 23: presents the Final measurements after the execution of principal component analysis and rotation matrix.

Entrepreneurial marketing measurements		
Dimension	**Measurements Code**	**Measurements after execution of PCA & rotation matrix**
Innovation Orientation *See (table 5.4)*	CI1	Our business objectives are driven by customer satisfaction.
	IO1	Being innovative is a competitive advantage for my company.
	CI4	We make sure that our company's competitive advantage is based on understanding customers' needs.
	Net3	In our firm we have a good relationship with each other and an important people in other firms.
	Net1	I encourage my team to strive for innovative approaches to creating relationships with customers.
Customer intensity *See (table 5.4)*	CI5	We frequently measure our company's customer satisfaction.
	Net4	We are experienced in dealing with technical partners.
	CI2	We pay close attention to after-sales service.
Risk management *See (table 5.4)*	IO3	We invent new products and services and regularly uses new distribution channels.
	RM1	My business would rather accept a risk to pursue an opportunity than miss it altogether.
	RM2	My business is willing to take risks when we think it will benefit the company.
Networking *See (table 5.4)*	IO2	My company's top management creates an atmosphere that encourages creativity and innovativeness.
	IO5	Our unit regularly uses new distribution channels.
	IO4	We frequently utilize new opportunities in new markets.

Technological capabilities measurements		
Remote work capability *Table (5.5)*	RWC1	We have reliable internet connection at my remote work location.
	RWC2	Our company provide a type of devices for remote work (e.g., laptop, desktop, tablet)
	RWC3	We have access to the necessary software/tools for remote collaboration and communication (e.g., video conferencing, project management tools)
Artificial intelligence *Table (5.5)*	AI1	Our organization employ AI technologies in the operation.
	AI5	Using AI applications will generate a high volume of sales and will increase our market share.
	AI3	Using AI technologies will generate a high volume of sales and will increase our market share.
Firm performance measurements		
Profitability *Table (5.6)*	PCS5	Our customers are satisfied with…We analyze and respond to feedback and comments from customers.
	PCS2	Our customers are satisfied with the enquiry service provided by this company.
	Su4	We regularly dispose of production waste to reduce environmental pollution.
Sustainability *Table (5.6)*	Su3	We give an attention the integration of green practices in the supply chain.
	P5	Maximizing profitability of the firm encourages shareholder to expand the investments.
	P1	Our company invest in return on assets as a main resource to maximize profitability.
Presumed customer satisfaction. *Table (5.5)*	PCS4	Our customers are satisfied with the service of handling customer dissatisfaction in this company.
	PCS1	Our customers are satisfied with the price of their purchased product(s) or services in this company.
	PCS3	Our customers are satisfied with the customer service in transactions.

Own creation by researcher (2024)

*Codes definition: **CI**: customer intensity, **IO**: innovation orientation, **RM**: risk management, **Net**: networking, **RWK**: remote work capability, **AI**: artificial intelligence, **P**: profitability, **SU**: sustainability, **PCS**: presumed customer satisfaction*

2.7. CFA results: reliability and validity

The measurement items underwent rigorous testing for reliability and validity via confirmatory factor analysis (CFA) using AMOS 25. Both discriminant and convergent validity were employed to assess validity. Convergent validity was evaluated using three key indicators: factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR), with 28

items established refer to Table 25. Consistent with Hair et al. (2019), items with factor loadings exceeding 0.50 were retained, and all item loadings in this study surpassed this cutoff and were statistically significant ($p<0.05$). Composite Reliability (CR) results showed that CR for all constructs ranged from 0.800 to 0.705, surpassing the recommended threshold of 0.50, indicating satisfactory composite reliability (Hair et al., 2019). Average Variance Extracted (AVE) values ranged from 0.579 to 0.508 for all constructs, exceeding the suggested threshold of 0.50 (Hair et al., 2019). In summary, this study establishes the good reliability and validity of the measurement items based on a comprehensive assessment of these metrics.

Table 24: Reliability and validity

Constructs	Measurement Items	Factor Loading	CR	AVE	P. Value
Networks	Item_1	0.662	0.771	0.560	0.000
	Item_2	0.753			0.000
	Item_3	0.744			0.000
	Item_4	0.745			0.000
	Item_5	0.716			0.000
Customer intensity	Item_1	0.621	0.718	0.511	0.000
	Item_2	0.702			0.000
	Item_3	0.753			0.000
Risk management	Item_1	0.684	0.755	0.508	0.000
	Item_2	0.751			0.000
	Item_3	0.732			0.000
Innovation orientation	Item_1	0.838	0.754	0.591	0.000
	Item_2	0.661			0.000
	Item_3	0.641			0.000
Remote Work Capability	Item_1	0.792	0.800	0.579	0.000
	Item_2	0.812			0.000
	Item_3	0.801			0.000
Artificial Intelligent	Item_1	0.860	0.782	0.521	0.000
	Item_2	0.852			0.000
	Item_3	0.821			0.000
Sustainability	Item_1	0.750	0.775	0.515	0.000
	Item_2	0.741			0.000
	Item_3	0.742			0.000
Profitability	Item_1	0.713	0.745	0.513	0.000
	Item_2	0.620			0.000
	Item_3	0.706			0.000
Presumed Customers Satisfaction	Item_1	0.752	0.765	0.516	0.000
	Item_2	0.752			0.000
	Item_3	0.748			0.000

CR =Composite Reliability and Average, AVE=Variance Extracted

2.7.1. Discriminant validity

In this study, discriminant validity was utilized, as proposed by Fornell and Larcker (1981), to assess whether variables that are theoretically unrelated do not display high correlations. Following their guidance, discriminant validity is confirmed when the square root of the Average Variance Extracted (AVE) for a construct is greater than the correlation values between all constructs. As shown in Table 26, the square root of the AVE scores for all variables surpasses the inter-construct correlations, indicating the established discriminant validity of the data.

2.7.2. Model fit.

The assessment of the fitness quality of the measurement model involved the utilization of various goodness-of-fit measures. The results obtained from this analysis reveal a highly favorable model fit. Specifically, the comparative fit index (CMIN/df) stands at 1.980, indicating a strong alignment between the model and the observed data. Additionally, the goodness-of-fit index (GFI) attains a commendable value of 0.903, suggesting a high level of overall fit. Furthermore, both the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) demonstrate strong agreement with values of 0.904 and 0.911 respectively. These indices corroborate the robustness of the model in capturing the underlying constructs accurately. Moreover, the Root Mean Square Error of Approximation (RMSEA) is reported at 0.061, indicating a small discrepancy between the model and observed data. Consequently, these findings collectively support the assertion that the measurement model exhibits robust construct validity and reliability, providing a solid foundation for subsequent analyses and interpretations.

Table 25: Discriminant validity

	Networks	Customer intensity	Risk management	Innovation	Remote Work Capability	Artificial Intelligent	Sustainability	Profitability	Presumed Customers Satisfaction
Networks	**0.748**								
Customer intensity	0.710**	**0.714**							
Risk management	0.641**	0.674**	**0.0.712**						
Innovation orientation	0.623**	0.687**	0.572**	**0.748**					
Remote Work Capability	0.674**	0.612**	0.677**	0.537**	**0.760**				
Artificial Intelligent	0.521**	0.436**	0.439**	0.562**	0.458**	**0.721**			
Sustainability	0.521**	0.436**	0.439**	0.562**	0.458**	0.521**	**0.0.717**		
Profitability	0.441**	0.506**	0.414**	0.502**	0.451**	0.525**	0.406**	**0.716**	
Presumed Customers Satisfaction	0.5001**	0.536**	0.419**	0.522**	0.558**	0.511**	0.506**	0.439**	**0.718**

Notes: Bold values in diagonal represent the squared root estimate of AVE. AVE= Average Variance Extracted.

2.8. Correlation matrix

Pearson's correlation analysis was employed to examine the relationships between variables. The results displayed in Table 27 indicate significant correlations among all the independent, moderator, and dependent variables. However, Remote Work Capability exhibited no significant correlation with innovation orientation, profitability, and Presumed Customer Satisfaction ($p > 0.05$). Furthermore, the correlation coefficients ranging between 0.570 and 0.127 confirm the absence of multicollinearity issues. Multicollinearity is identified when there is a high correlation (0.9 or greater) between any independent variable and another set of independent variables (Tabachnick and Fidell, 2007).

Table 26: Correlation matrix of the variables

	IO	**CI**	**RM**	**Net**	**RWC**	**P**	**PCS**	**SU**
IO	1							
CI	0.314**	1						
RM	0.219**	0.292**	1					
Net	0.317**	0.404**	0.188**	1				
RWC	0.106	0.378**	0.165**	0.200**	1			
AI	0.203**	0.363**	0.127*	0346**	0.326**			
P	0.088	0.312**	0.129*	0.261**	0.03	1		
PCS	0.391**	0.347**	0.211**	0.311**	0.08	0.189**	1	
SU	0.308**	0.341**	0.130*	0.570**	0.158*	0.273**	0.251**	1

* Correlation is significant at the 0.05 level and **Correlation is significant at the 0.01 level

IO= innovation orientation, CI= Customer intensity, RM= Risk management, Net= Networks, RWC= Remote Work Capability, AI= Artificial Intelligent, P= profitability, PCS= Presumed Customers Satisfaction, and SU= Sustainability.

2.9. The Independent T test (ANOVA)

The significant effect of sector and Firm size on entrepreneurial marketing, technological capabilities, and firm Performance

The Independent T test was utilized to investigate the significant effect of Sector and Firm size on entrepreneurial marketing, technological capabilities, and firm Performance. The results presented in table 29 indicate that there are no significant differences between sectors (services

and industrial) in terms of entrepreneurial marketing (p = 0.183), technological capabilities (p = 0.888), or firm performance (p = 0.278).

Table 27: The Independent T test of the effect of sector on entrepreneurial marketing, technological capabilities, and firm Performance

Variables	Sector	N	Mean	Std. Deviation	t value	P value
Entrepreneurial marketing	Services	149	3.883	0.5178	1.263	0.183
	Industrial	106	3.809	0.3670		
Technological capabilities	Services	149	3.739	0.588	0.141	0.888
	Industrial	106	3.729	0.483		
Firm Performance	Services	149	3.800	0.492	1.088	0.278
	Industrial	106	3.735	0.437		

Own creation by researcher (2024).

Regarding the firm size, the results presented in table 30 reveal no significant differences in entrepreneurial marketing, technological capabilities, and firm Performance between small firms (1 to 5 employees) and medium firms (6 to 49 employees), as indicated by non-significant t-values ($p > 0.05$).

Table 28: Independent t test of the effect of firm size on entrepreneurial marketing, technological capabilities, and firm Performance

Variables	Firm size	N	Mean	Std. Deviation	T value	P value
Entrepreneurial marketing	Small firm (1 to 5 employees)	107	3.843	0.352	-0.343	0.732
	Medium firm (6 to 49 employees)	147	3.863	0.527		
Technological capabilities	Small firm (1 to 5 employees)	107	3.786	0.531	1.239	0.217
	Medium firm (6 to 49 employees)	147	3.700	0.556		
Firm Performance	Small firm (1 to 5 employees)	107	3.891	0.432	1.248	0.213
	Medium firm (6 to 49 employees)	147	3.687	0.481		

Own creation by researcher (2024).

CHAPTER 6
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.

1. 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.

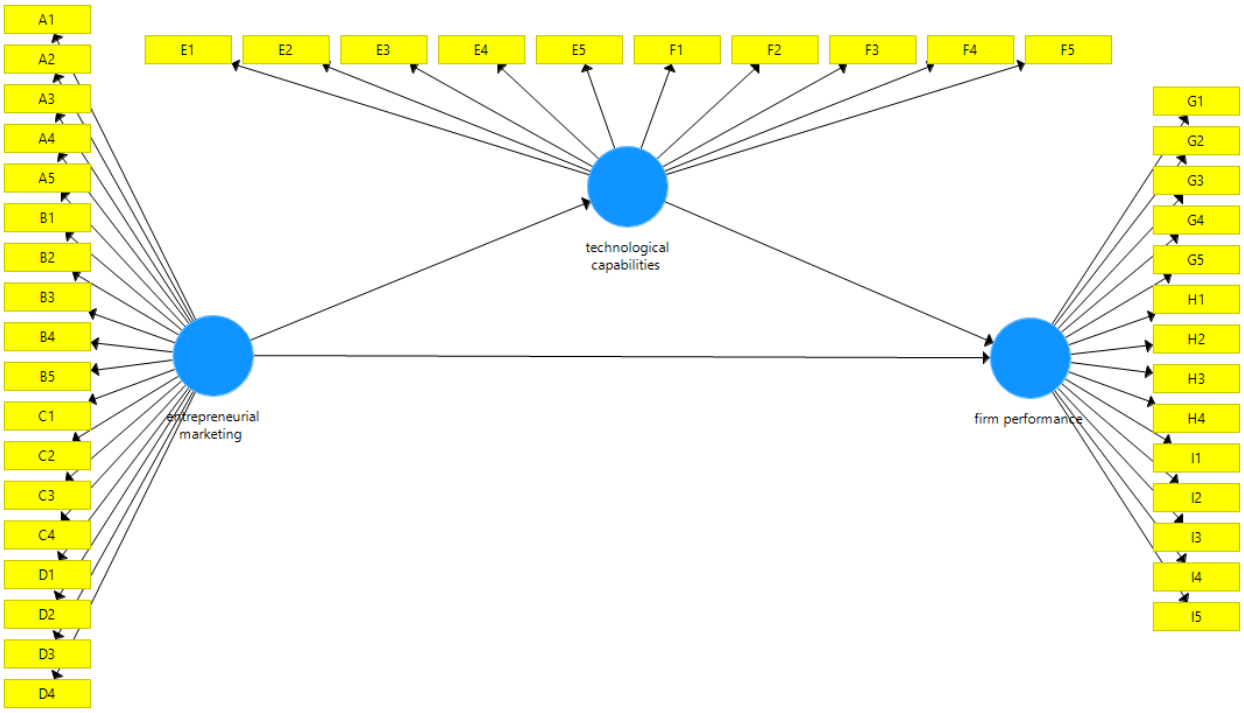


Figure 9: Measurement model

1.1. Validation of the measurement model "Outer model"

1.1.1. Measurement of the reliability of the measurement model

In this part of the study, I will first assess the internal consistency of the model by examining the reliability of the individual indicators' loadings within the framework of data analysis conducted using "Smart PLS 3". Then, I will analyze composite reliability, also known as "Composite Reliability", to ensure the robustness and overall coherence of our reflective measurement model. This approach will enable us to ensure the reliability and quality of the obtained measures.

1.1.1.1. Reliability of the "Loading" indicators

In my study, I applied a rigorous analysis of the items to ensure the reliability and validity of our results. To achieve this, we retained only the items with outer loadings greater than 0.7. This threshold is commonly used in statistical analyses to ensure that the items contribute significantly to the construction of the latent variable.

Outer loadings represent the correlation between an item and the latent variable it is supposed to measure. A high outer loading (greater than 0.7) indicates that the item is strongly linked to the latent variable, meaning it is a good indicator of that variable.

By applying this criterion, I eliminated the following items because their outer loadings were less than **0.7:** (A1, A2, A5, B5, C1, C2, C3, C4, D1, D2, F4, G3, H2, H3, H4, I1, I2, I3, I4, and I5).

The removal of these items aims to enhance the quality and accuracy of our measurement by retaining only the most relevant and reliable items. The items retained, as shown in the table below, are those that meet the criterion of having an outer loading greater than 0.7. This ensures that our study is based on robust measures and that the conclusions drawn will be founded on reliable data.

Table 29: Reliability and significance of indicators - "Outer Loading"

Variables	Items	Loading
Entrepreneurial marketing	A3	0,772
	A4	0,816
	B1	0,767
	B2	0,857
	B3	0,787
	B4	0,825
	D3	0,786
	D4	0,761
Technological capabilities	E1	0,885
	E2	0,742
	E3	0,906
	E4	0,919
	E5	0,870
	F1	0,871
	F2	0,908
	F3	0,872
	F5	0,908
Firm performance	G1	0,832
	G2	0,872
	G4	0,847
	G5	0,849
	H1	0,918

1.1.1.2. Composite reliability of lower-order latent variables "Composite Reliability"

In the context of PLS-SEM, one of the primary criteria used to evaluate this reliability is the composite reliability criterion (Avkiran and Ringle, 2018). Unlike Cronbach's alpha, which can overestimate or underestimate scale reliability, composite reliability is preferred as it provides a more accurate alternative (Garson, 2016).

Like any reliability measure, including Cronbach's alpha, composite reliability values range between 0 and 1 (Hair et al., 2017). In exploratory research phases, values between 0.60 and 0.70 are considered acceptable, while in more advanced research stages, values between 0.70 and 0.90 are deemed satisfactory. However, values exceeding 0.95 could indicate redundancy in the items used, while values below 0.60 indicate a lack of internal consistency reliability (Garson, 2016; Hair et al., 2017; Avkiran and Ringle, 2018; Hair et al., 2021).

The results obtained through analysis with "Smart PLS 3" demonstrate improved composite reliability for our case study. All constructs exhibit composite reliability exceeding 0.7, which is encouraging as it indicates good internal consistency.

Table 30: Composite reliability of constructs - "Composite Reliability"

Variables	Reliability of constructs	
	Cronbach's alpha	Composite Reliability
Entrepreneurial marketing	0,926	0,940
Firm Performance	0,923	0,942
Technological capabilities	0,963	0,968

1.1.2. Convergent validity

The third step involves evaluating the convergent validity of each construct, which is the extent to which the construct succeeds in explaining the variance of its indicators (Hair et al., 2021).

The metric used to assess this convergent validity is the average variance extracted (AVE) for all indicators of each construct (Urbach and Ahlemann, 2010; Ringle et al., 2015; Sarstedt et al., 2017). AVE is defined as the average of the squares of the loadings of indicators associated with the construct (i.e., the sum of the squares of loadings divided by the number of indicators), thus representing the construct's communality (Hair et al., 2021).

The minimum acceptable AVE is 0.50 or higher, indicating that the construct explains 50% or more of the variance of the indicators comprising it (Garson, 2016; Hair et al., 2017; Avkiran and Ringle, 2018; Hair et al., 2021).

In our research, all Average Variance Extracted (AVE) values exceed 0.600. Specifically, Entrepreneurial Marketing has an AVE of 0.661, Firm Performance has an AVE of 0.765, and Technological Capabilities has an AVE of 0.772. This indicates that all elements of our measurement model explain more than 66%, 76.5%, and 77.2% of their respective observable variables (items). These results demonstrate good convergent validity, suggesting that the constructs are well-represented by their measured items.

Table 31: Convergent validity- « AVE Test »

Variables	Average Variance Extracted (AVE)
Entrepreneurial marketing	**0,661**
Firm Performance	**0,765**
Technological capabilities	**0,772**

1.1.3. Discriminant validity

In the fourth step, I proceed with the evaluation of discriminant validity (Hair et al., 2021). This evaluation measures how well a concept is distinct from other concepts included in the structural model (Sarstedt et al., 2017). Traditionally, researchers use two common measures for this purpose: the Fornell-Larcker criterion and the Cross-Loading test (Henseler et al., 2015).

1.1.3.1. Discriminant validity at the construct level « Fornell and Larcker Test »

According to Garson (2016), the Average Variance Extracted (AVE) can be used to assess discriminant validity using the Fornell-Larcker criterion. Indeed, for any latent variable, the square root of the AVE should be greater than its correlation with any other latent variable. This means that the shared variance between a latent variable and its indicators should be higher than the variance it shares with other latent variables (Hair et al., 2017).

In the output of "Smart PLS 3", the Fornell-Larcker criterion table presents the square root of the average extracted variance (AVE) in the diagonal cells, while the correlations are displayed below (Garson, 2016). In other words, the absolute value of the square root of the AVE in each factor column is compared to the values (correlations) below (Hair et al., 2017). If the top value

(square root of AVE) in any factor column is greater than the values (correlations) below, it indicates discriminant validity (Avkiran and Ringle, 2018).

By using the Fornell-Larcker test, I confirm the discriminant validity of our measurement model. I observe that the square root of the AVE in each factor column is greater than the correlations below, confirming that the measures represent unique and distinct concepts. This consolidation enhances confidence in our model's ability to accurately distinguish between the different measured variables and to avoid multicollinearity issues between factors.

Table 32: Discriminant validity - "Fornell and Larcker Test"

	Entrepreneurial marketing	**Firm Performance**	**Technological capabilities**
Entrepreneurial marketing	0,855		
Firm Performance	0,813	0,950	
Technological capabilities	0,810	0,874	0,879

1.1.3.2. Discriminant validity at the indicator level - "Cross-Loading Test"

Cross-loadings are commonly used as the initial approach to assess the discriminant validity of indicators (Crockett, 2012). To achieve optimal validity of a construct, the loadings expected for a "Loading" construct should ideally exceed 0.7 (or sometimes 0.6), while cross-loadings should be below 0.3 (or sometimes 0.4) (Garson, 2016).

In other words, an indicator should have a higher external loading on the construct it is supposed to be associated with than on any other correlated construct (i.e., its cross-loadings) (Wong, 2013). A recommended method to evaluate and present these cross-loadings is to create a table with indicators listed in rows and latent variables in columns (Hair et al., 2017).

Based on the aforementioned criteria, our measurement model demonstrates remarkable discriminant validity, approaching the ideal described by Wong (2013). To illustrate this, the table below provides a concrete and detailed representation of the results obtained.

Table 33: Discriminant validity - "Cross-Loading Test"

	Entrepreneurial marketing	Firm Performance	Technological capabilities
A3	0,790	0,558	0,546
A4	0,854	0,675	0,707
B1	0,797	0,655	0,650
B2	0,883	0,609	0,696
B3	0,757	0,660	0,656
B4	0,862	0,649	0,702
D3	0,795	0,532	0,513
D4	0,758	0,476	0,719
E1	0,747	0,841	0,806
E2	0,643	0,683	0,528
E3	0,703	0,860	0,609
E4	0,755	0,867	0,623
E5	0,706	0,829	0,668
F1	0,741	0,828	0,577
F2	0,738	0,878	0,613
F3	0,710	0,828	0,575
F5	0,708	0,884	0,614
G1	0,750	0,567	0,839
G2	0,608	0,560	0,837
G4	0,716	0,560	0,785
G5	0,696	0,546	0,792
H1	0,745	0,636	0,896

1.2. Validation of model structure « Inner model »

If the external evaluation of the measurement model justifies the estimated constructs, then the internal evaluation of the structural model is undertaken, following the methodology proposed by Hair et al. (2021). The analysis of the structural model aims to provide evidence supporting the

theoretical relationships established between the exogenous variables and the endogenous variable, as defined by Avkiran and Ringle (2018).

To conduct this analysis of the structural model, it is essential to examine the following elements, including the significance of the path coefficients that represent the hypothetical relationships between different variables, which will be addressed in the next section.

1.2.1. R-Square (R^2)

The coefficient of determination "R2" is the most common measure for evaluating the performance of a structural model. According to Hair et al. (2021), this coefficient is defined as a measure of the predictive capability of the model, calculated by assessing the squared correlation between the actual and predicted values of a specific endogenous variable (Henseler et al., 2015).

Hair et al. (2017) provided guidance on interpreting "R2" values. An "R2" of 0.25, 0.50, and 0.75 is respectively considered low, moderate, and substantial. Chin (1998) suggested that "R2" values above 0.67 are considered high, those between 0.33 and 0.67 are moderate, while those between 0.19 and 0.33 are low. Any "R2" value below 0.19 is deemed unacceptable. Additionally, Falk and Miller (1992) proposed a minimum acceptable threshold for the "R2" coefficient, set at 0.10.

The results presented in the table below demonstrate moderate levels of significance for the R-squared and adjusted R-squared coefficients, confirming the robustness of our model.

Table 34: Coefficient of Determination "R^2" Test

Variables	R^2	R^2 values	Signification
Firm Performance	0,910	0,909	**High**
Technological capabilities	0,728	0,727	**High**

1.2.2. Effect Size (f2)

This statistic measures the significance of the exogenous construct(s) in explaining the endogenous construct and recalculates "R^2" by omitting one exogenous construct at a time

(Avkiran and Ringle, 2018). Again, effect sizes of 0.02 are small, 0.15 are moderate, and 0.35 are substantial (Cohen, 1988; Hair et al., 2017).

Table 35: Coefficient of Determination "f²" Test

	Entrepreneurial marketing	Firm Performance	Technological capabilities
Entrepreneurial marketing		0,079	**2,682**
Firm Performance			
Technological capabilities		**1,992**	

1.2.3. Test of Model Predictive Relevance "Q²"

This statistic is obtained through the resampling technique called "Blindfolding," where the omission distance is set between 5 and 10, ensuring that the number of observations divided by the omission distance is not an integer (Hair et al., 2017; Avkiran et Ringle, 2018).

If Q^2 is greater than zero, it indicates the predictive relevance of the path model in the context of the endogenous construct and its corresponding reflective indicators (Avkiran et Ringle, 2018).

Table 36: Predictive Relevance Test "Q²"

	SSO	SSE	Q²
Entrepreneurial marketing	2040,000	2040,000	
Firm Performance	1275,000	395,304	**0,690**
Technological capabilities	2295,000	1014,488	**0,558**

1.2.4. Goodness-of-Fit (GoF) Test

GoF, a measure introduced by (Tenenhaus et al. 2005), integrates effect size with convergent validity. Unlike other measures, GoF ranges from 0 to 1, but it cannot be directly calculated by "Smart PLS 3," thus requiring manual computation (Garson, 2016).

Its determination involves taking the geometric mean of the average communality for the outer model and the average R-squared for the inner model, as proposed by Tenenhaus et al. (2005). In other words, the goodness of fit is assessed by finding the square root of the product of communality and R-squared, as mentioned by Henseler et al. (2015).

$$GoF = \sqrt{(\overline{R^2} \times \overline{AVE})}$$

The criteria for GoF to evaluate whether values are appropriate, small, moderate, or large to consider a PLS model as valid were established by Wetzels et al. (2009). Indeed, when GoF is less than 0.1, it means there is no appropriate model fit. A value between 0.1 and 0.25 is considered small, indicating moderate fit. If GoF falls between 0.25 and 0.36, this is deemed moderate, indicating relatively acceptable fit. Finally, a GoF greater than 0.36 is termed large, signifying substantial fit of the PLS model (ibid.).

According to the data presented in the table below, the Goodness-of-Fit (GoF) index is extremely satisfactory with a value of 0.775, thus significantly exceeding the recommended threshold of 0.36.

Table 37: GoF Index of the Research Model

Variables	R 2	Average variance extracted (AVE)
Entrepreneurial marketing	**----**	**0,661**
Firm Performance	**0,910**	**0,765**
Technological capabilities	**0,728**	**0,772**
Total	**1.638**	**2.198**
Moyenne	**0.819**	**0.733**
GoF	**0.775**	

2. Structural Model Validity Testing Using the PLS Method

In this section, I will present hypotheses based on the literature review and theoretical foundations of our research. Next, I will analyze the results of hypothesis validity testing to evaluate the confirmation or refutation of our hypotheses by empirical data. Finally, I will interpret these results to provide an in-depth understanding of the consistency between our structural model and the collected data. This process will enable us to draw informed conclusions regarding the relevance of our hypotheses in the context of our study.

2.1. Results of Hypothesis Validity Testing

The significance of a coefficient primarily relies on its standard error, evaluated using the "Bootstrap" method (Garson, 2016). This approach enables the calculation of empirical "T" and "P" values for all structural path coefficients (Hair et al., 2021).

The "P" value is widely used by researchers to assess the degree of statistical significance (Chin, 1998). It indicates the probability of obtaining a "T" value as extreme as, or more extreme than, the observed value, assuming the null hypothesis is true (Hair et al., 2017).

To establish the significance of a relationship at a 5% confidence level, the "P" value associated with the path coefficient must be less than 0.05 (Hair et al., 2021). By setting this threshold at 0.05, if the "P" value is lower than this threshold for a given path coefficient, the hypothesis is accepted; otherwise, it is rejected (Kock, 2016; Lee, 2016).

When the empirical "T" value exceeds the critical value, it allows us to conclude that the coefficient is statistically significant with a certain probability of error, corresponding to the chosen level of significance (Hair et al., 2017).

Examination of Table 13 indicates that out of the three hypotheses formulated in the model, all of them are strongly supported by the presented data. These hypotheses are supported by compelling results.

Table 38: Parameter Estimation of the Causal Model using the Bootstrap Method

Hypotheses	Relations	Std Beta	Std Error	T value	P value	Signification
H1	**Entrepreneurial marketing -> Firm performance**	0,162	0,033	4,851	**0,000**	**Accepted**
H2	**Entrepreneurial marketing -> Technological capabilities**	0,853	0,013	64,404	**0,000**	**Accepted**
H3	**Technological capabilities -> Firm performance**	0,812	0,033	24,950	**0,000**	**Accepted**

2.2. 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.

2.3. Estimation of Moderating Effects

This section of our research focuses on identifying and analyzing the results related to the moderating effects to determine how these factors influence or alter the relationships between the main variables. Specifically, I focus on understanding the role of **Technological capabilities** in the causal process linking **Entrepreneurial marketing** and **Firm performance**.

2.3.1. 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 our research, I focus our 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 10.

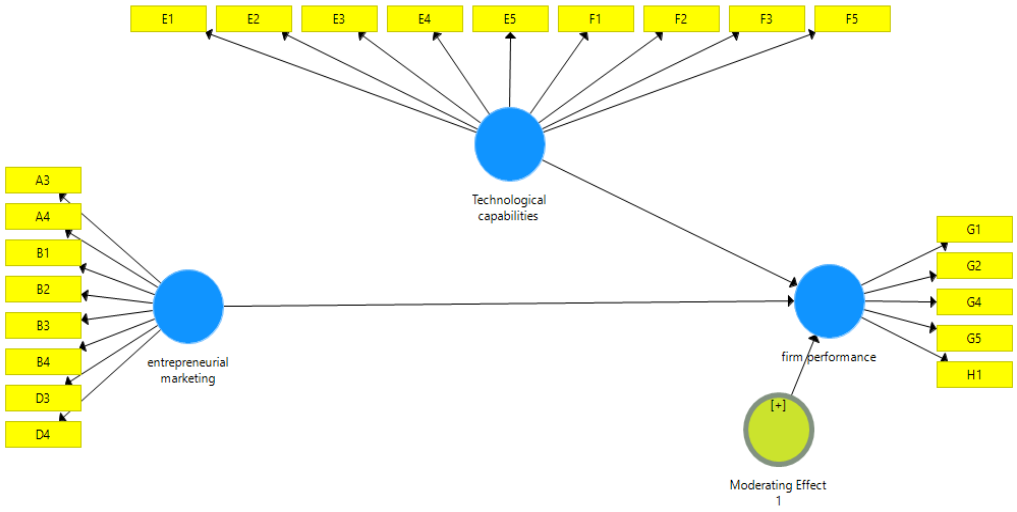


Figure 10:Moderation model

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 39: 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, our 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 40: 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**

3. Discussion

3.1. The Relationship Between Entrepreneurial Marketing and Firm Performance

The results from the PLS analysis provide strong support for **Hypothesis 1 (H1)**, affirming that **entrepreneurial marketing (EM) positively impacts firm performance** in Sudanese SMEs. The analysis demonstrates a statistically significant positive relationship between EM and firm performance, as indicated by a robust beta coefficient. This suggests that SMEs that embrace EM strategies—such as innovation orientation, customer intensity, and networking—are better positioned to improve key performance metrics, particularly profitability and sustainability.

Entrepreneurial marketing, by its nature, encourages firms to be more dynamic, adaptable, and responsive to changes in the marketplace. The **innovation orientation** component of EM allows firms to constantly seek new opportunities, develop innovative products or services, and refine internal processes. By fostering a culture of continuous improvement and innovation, firms are able to differentiate themselves from competitors, leading to enhanced profitability. For Sudanese SMEs, where resources may be more limited and market competition more intense, the ability to innovate is critical to maintaining a competitive edge.

Moreover, **customer intensity** plays a central role in entrepreneurial marketing, driving firms to deepen their understanding of customer needs and preferences. SMEs that actively engage with their customers are better able to tailor their offerings, create stronger customer relationships,

and foster loyalty. This customer-centric approach not only helps in retaining existing customers but also in attracting new ones, thereby boosting sales and, ultimately, profitability. The PLS analysis shows that firms that adopt customer-focused EM practices see a direct positive effect on their performance outcomes.

In addition, **networking**—another key element of entrepreneurial marketing—enables SMEs to build valuable connections with stakeholders, such as suppliers, partners, and customers. Networking creates opportunities for collaboration, knowledge exchange, and access to new markets, all of which can significantly enhance a firm's performance. By forming strategic partnerships, SMEs in Sudan can leverage external resources and capabilities that they may not have internally, thereby improving their competitiveness and market reach.

These findings directly address **Research Question 1.2 (RQ1.2)**, which sought to explore the relationship between entrepreneurial marketing and firm performance in Sudanese SMEs. The results confirm that the adoption of EM strategies is closely linked to improved business performance. Firms that effectively implement EM are better equipped to navigate market challenges, respond to customer demands, and innovate more effectively. This ability to adapt and innovate allows them to achieve superior financial performance, as reflected in increased profitability and sustainability.

Additionally, the findings suggest that Sudanese SMEs are progressively recognizing the importance of entrepreneurial marketing as a vital business strategy. This aligns with **Research Question 1.1 (**RQ1**.1)**, which aimed to assess the extent of understanding and implementation of EM within Sudanese SMEs. The results indicate a growing awareness and integration of EM strategies, particularly as these firms face an increasingly competitive and challenging market environment. As SMEs in Sudan become more familiar with the principles of entrepreneurial marketing, they are more likely to implement these strategies to enhance their overall performance.

In conclusion, the positive relationship between entrepreneurial marketing and firm performance emphasizes the critical role that EM plays in the success of Sudanese SMEs. By focusing on innovation, customer intensity, and networking, firms are able to drive profitability and ensure long-term sustainability. These findings underscore the need for SMEs to continue investing in entrepreneurial marketing practices to remain competitive and achieve growth in a dynamic business environment.

3.2. The Relationship Between Entrepreneurial Marketing and Technological Capabilities

The results of the PLS analysis provide strong support for **Hypothesis 2 (H2)**, showing that **entrepreneurial marketing (EM) positively influences technological capabilities** within Sudanese SMEs. This finding highlights the vital link between EM practices and the development of advanced technological tools. SMEs that actively engage in entrepreneurial marketing are more likely to adopt and utilize technologies such as **remote work capabilities**, **artificial intelligence (AI)**, and other digital innovations, which in turn improve their operational efficiency and competitiveness.

Entrepreneurial marketing emphasizes **innovation orientation**, which encourages firms to seek out and integrate new technologies to enhance their operations. Firms that prioritize innovation through EM strategies are more likely to invest in technologies that streamline workflows, reduce costs, and improve customer interactions. In today's fast-evolving business environment, technological adoption is crucial for staying competitive, and firms that integrate EM are better equipped to leverage these tools effectively. This positive relationship suggests that the more a firm focuses on entrepreneurial marketing, the more persuaded it is to explore and implement new technological solutions that drive innovation.

One of the significant contributions of this study is its focus on **how EM influences technological advancement** in Sudanese SMEs. The findings suggest that firms adopting EM strategies are not only focused on traditional business performance metrics, such as profitability and customer satisfaction, but also on enhancing their technological infrastructure. Technologies like **AI** can support customer-focused EM activities by enabling better customer data analysis, improving customer service, and personalizing marketing strategies. Additionally, **remote work capabilities** can empower SMEs to operate more flexibly, which is particularly important in environments with logistical challenges, such as those faced by businesses in Sudan.

The PLS analysis shows that entrepreneurial marketing serves as a **mechanism for technological adoption**. The **innovation, customer intensity, and networking** components of EM encourage firms to experiment with and implement technologies that can significantly boost their operations. For example, innovation-oriented SMEs are more likely to explore the use of AI for improving customer experiences or adopting digital platforms for better business operations.

Likewise, customer-oriented firms are persuaded to leverage technology to enhance communication, intensity, and service delivery.

This finding aligns with **Research Question 1.3 (RQ1.3)**, which aimed to identify the benefits of employing technological capabilities in Sudanese SMEs. The study reveals that **entrepreneurial marketing drives technological adoption**, with EM acting as a strategic framework that pushes firms to invest in technology that complements and enhances their entrepreneurial efforts. This technological advancement, in turn, allows SMEs to remain competitive in a rapidly changing market. By incorporating technology into their business models, these firms can innovate faster, respond more effectively to market demands, and improve their overall efficiency.

Furthermore, the study emphasizes the **interactive relationship between entrepreneurial activities and technological innovation**. As SMEs grow more entrepreneurial in their approach-seeking to innovate, engage customers, and expand networks—they become more aware of the technological advancements that can further support their growth. For example, firms that prioritize networking as part of their EM strategy may find that digital platforms and social media technologies help them expand their reach and strengthen their relationships with partners and customers. In this way, EM not only influences how firms operate but also how they view and utilize technology.

This interplay between entrepreneurial marketing and technological capabilities highlights the **strategic importance of EM in promoting technological innovation**. In the context of Sudanese SMEs, where access to advanced technology may be more limited than in other regions, this finding underscores the need for businesses to integrate entrepreneurial thinking with technology adoption. By doing so, these firms can enhance their operational efficiency, improve their market responsiveness, and ensure their long-term sustainability in an increasingly digital and competitive global economy.

In conclusion, the relationship between entrepreneurial marketing and technological capabilities in Sudanese SMEs 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. This dynamic is critical for SMEs in emerging markets, where technology can provide the necessary tools to innovate, streamline processes, and sustain growth in the face of global market

challenges. The findings of this study underscore the importance of fostering a culture of entrepreneurship and innovation within SMEs to ensure they remain agile, competitive, and technologically advanced.

3.3. The Relationship Between Technological Capabilities and Firm Performance

The validation of **Hypothesis 3 (H3)** provides compelling evidence that **technological capabilities positively impact firm performance** in Sudanese SMEs. The PLS analysis confirms that firms with more advanced technological infrastructures experience significantly better business outcomes, such as increased profitability and improved sustainability. This finding demonstrates the vital role that technology plays in enhancing firm performance, particularly in environments where market conditions are increasingly competitive and dynamic.

Technological capabilities, including **remote work infrastructure**, **artificial intelligence (AI)**, and digital platforms, enable firms to operate more efficiently, optimize resources, and engage with customers more effectively. SMEs that invest in these technologies are able to streamline their operations, reduce operational costs, and improve overall productivity. These efficiency gains directly translate into improved financial performance, allowing firms to be more profitable while maintaining or even improving their sustainability practices.

This finding directly addresses **Research Question 1 (RQ1)**, which sought to determine whether technological capabilities moderate the relationship between entrepreneurial marketing (EM) and firm performance. The results from the PLS analysis indicate that technological capabilities do more than simply support entrepreneurial strategies—they **amplify** their impact. Firms that adopt technologies such as AI are able to enhance their customer intensity strategies by personalizing interactions, predicting customer needs, and delivering more efficient services. Similarly, remote work capabilities provide flexibility, enabling businesses to continue operating seamlessly despite physical or logistical challenges, which is particularly relevant for SMEs in Sudan.

By enhancing **operational efficiency**, technological capabilities enable firms to better utilize their entrepreneurial marketing efforts. For example, SMEs that implement AI can automate repetitive tasks, freeing up resources to focus on more strategic aspects of EM, such as innovation and customer relationship management. This technological leverage allows SMEs to scale their operations and achieve better performance without a proportional increase in costs. The study

suggests that firms that combine entrepreneurial marketing with strong technological capabilities are not only more efficient but also more agile, able to respond quickly to changing market conditions and customer preferences.

Moreover, **technological readiness** plays a critical role in a firm's ability to innovate and stay competitive. SMEs with robust technological infrastructures are better equipped to adopt and implement innovative solutions, which are crucial for long-term growth and market leadership. Technological capabilities provide a platform for continuous improvement, enabling firms to innovate faster and more effectively. This capacity for innovation helps firms maintain a competitive advantage, ensuring that they can not only survive but thrive in increasingly complex and competitive markets.

The **sustainability** aspect of technological capabilities is also noteworthy. By adopting technologies that streamline operations and improve efficiency, firms are able to reduce waste, minimize resource consumption, and implement more sustainable business practices. For example, remote work infrastructure reduces the need for physical office space and commuting, contributing to lower carbon footprints. Similarly, AI can be used to optimize supply chains, reducing excess inventory and minimizing environmental impact. These technological advancements allow firms to not only improve their financial performance but also align with global sustainability trends, which is becoming increasingly important for long-term success.

In conclusion, the PLS analysis underscores the strategic importance of **integrating technology into business operations**. SMEs that invest in technological capabilities, such as AI and remote work tools, are better positioned to maximize the benefits of their entrepreneurial marketing strategies, improve operational efficiency, and sustain a competitive advantage. This relationship between technological capabilities and firm performance highlights the critical need for SMEs in Sudan to prioritize technology adoption as a key component of their business strategy. By doing so, they can enhance their ability to innovate, adapt to market changes, and achieve sustainable growth in a rapidly evolving business environment.

3.4. The Moderating Role of Technological Capabilities in the Relationship Between Entrepreneurial Marketing and Firm Performance

The validation of **Hypothesis 4 (H4)**, which asserts that **technological capabilities can play a moderating role in the relationship between entrepreneurial marketing (EM) and firm**

performance (FP), adds a crucial layer to the overall findings of this study. The results from the PLS analysis confirm that **technological capabilities not only impact firm performance directly**, but also strengthen the relationship between EM and firm performance, amplifying the positive effects of entrepreneurial marketing strategies.

This moderation effect suggests that SMEs with higher levels of technological readiness—such as advanced digital tools, AI, and remote work capabilities—are better positioned to **leverage their EM efforts** to drive stronger performance outcomes. Firms that have integrated technology into their operations are more agile, responsive, and capable of enhancing their entrepreneurial activities, which leads to greater profitability and sustainability. Essentially, technology acts as a **substance** that magnifies the benefits of EM, allowing firms to innovate more effectively, engage customers more deeply, and build stronger networks.

This finding aligns closely with the core premise of **Research Question 1 (RQ1)**, which examined whether technological capabilities could moderate the relationship between EM and firm performance. The results show that technology **amplifies the effectiveness of EM**, meaning that firms that invest in both entrepreneurial strategies and technological infrastructure are likely to see superior business performance compared to firms that focus solely on EM without supporting technological investments. This dynamic is especially important in the context of **Sudanese SMEs**, where technological integration may still be in its early stages but holds significant potential for enhancing competitiveness and growth.

By providing empirical evidence for the moderating role of technology, this study underscores the strategic importance of **technological capabilities in maximizing the impact of EM strategies**. SMEs that are technologically advanced can better navigate market fluctuations, capitalize on emerging opportunities, and sustain their competitive advantage. This reinforces the notion that **technology and entrepreneurial marketing are not separate strategies**, but rather complementary forces that, when aligned, drive substantial improvements in firm performance.

In conclusion, the confirmation of **H4** highlights that **technological capabilities are essential for optimizing the benefits of entrepreneurial marketing**. Firms that integrate advanced technologies into their EM efforts are not only more efficient and innovative but also more adaptable and better equipped to compete in rapidly changing markets. This finding is particularly relevant for **emerging markets like Sudan**, where technological adoption can serve as a powerful enabler of entrepreneurial success.

4. 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.

5. 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 **blueprint 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.

Research Scientific novelty

Results of thesis evaluation are summarized in Table 42.

Table 42: Research Scientific novelty

Primary research methos	ID	Thesis Discovery	Thesis & the novelties of the thesis	Scientific novelty
Empirical & exploratory qualitative research	1st Theme (EM)	*Segmentation*	The qualitative findings, allowing an in-depth discovery of Entrepreneurial Marketing dimensions such as **segmentation**, **networking**, and **agility**. This findings 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
		Agility		
		Networking		
	2nd Theme (TCPs)	*Artificial Intelligent "AI"*	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
		Remote-Work Capability	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 problems and make effective performance for the firms.	New
		Digital Communication		Novel
		New business models	This dimension for TCPs are 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)**	*The Relationship Between EM and Firm Performance*	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)	*The relationship between EM and TCPs in Sudanese SMEs*	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)	*The Moderating Role of TCPs in the Relationship Between EM and Firm Performance*	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 EM 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 confusion 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.

References

1. (2022). Customer Orientation. doi: 10.1002/9781119902430.ch1.
2. (2022). How Sustainable is an Innovation Strategic Orientation? doi: 10.5465/ambpp.2022.12651abstract.
3. (2023). Managing Risk. doi: 10.1002/9781394185504.ch6.
4. (2023). Market Orientation. Advances in business strategy and competitive advantage book series, doi: 10.4018/978-1-6684-6782-4.ch010.
5. Abdi, H., and Williams, L.J. (2010) 'Principal component analysis', Wiley interdisciplinary reviews. Computational statistics, 2(4), pp. 433-459 Available at: 10.1002/wics.101.
6. Abdi, H., and Williams, L.J. (2010) 'Principal component analysis', Wiley interdisciplinary reviews. Computational statistics, 2(4), pp. 433-459 Available at: 10.1002/wics.101.
7. Abrokwah-Larbi, K. (2024). The impact of customer-focus on the performance of business organizations: evidence from SMEs in an emerging West African economy. *African Journal of Economic and Management Studies*, *15*(1), 31-59.
8. Acquisti, A., et al. (2015). Privacy and human behavior in the age of information. Science, 347(6221), 509-514.
9. Adamovic, M. (2022). How does employee cultural background influence the effects of telework on job stress? The roles of power distance, individualism, and beliefs about telework. *International Journal of Information Management*, 62, 102437.
10. Agnihotri, R., Dingus, R., Hu, M. Y., & Krush, M. T. (2016). Social media: Influencing customer satisfaction in B2B sales. *Industrial marketing management*, 53, 172-180.
11. Akter, S., et al. (2019). How can digital networking enhance customer intensity for SMEs? *Industrial Marketing Management*, 79, 81-91.
12. Akuma, T. (2017). *Measuring Customer Based Brand Equity of Selected Television Channels in Addis Ababa: The Media Service Buyer's perspective* (Doctoral dissertation, Thesis Paper, Addis Ababa University school of Commerce).
13. Ali, S., Peters, L. D., & Lettice, F. (2012). An organizational learning perspective on conceptualizing dynamic and substantive capabilities. *Journal of Strategic Marketing*, 20(7), 589-607.
14. Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. Psychological Science in the Public Interest, 16(2), 40-68.
15. Al-Matari, E. M., Al-Swidi, A. K., & Fadzil, F. H. B. (2014). The measurements of firm performance's dimensions. *Asian Journal of Finance & Accounting*, *6*(1), 24.
16. Alqahtani, N., & Uslay, C. (2020). Entrepreneurial marketing and firm performance: Synthesis and conceptual development. *Journal of Business Research*, *113*, 62-71.
17. AMF, 2017). The business environment of small and medium enterprises in the Arab countries, The current situation and challenges. P. 5,7.

18. Anderson, E. W., & Sullivan, M. W. (1993). The antecedents and consequences of customer satisfaction for firms. *Marketing Science*, 12(2), 125-143.
19. Anderson, J. C., & Narus, J. A. (1990). A model of distributor firm and manufacturer firm working partnerships. Journal of Marketing, 54(1), 42-58.
20. Arena, M., Azzone, G., Bengo, I., & Minoja, M. (2018). A dynamic capability view of internal and external collaboration for innovation in the healthcare sector. *International Journal of Production Economics*, 196, 162-175.
21. Avkiran, N. K., & Ringle, C. M. (Eds.). (2018). Partial least squares structural equation modeling: Recent advances in banking and finance (Vol. 239). Cham, Switzerland: Springer.
22. Awang, Z. (2014). Research Methodology and Data Analysis (2nd ed.). Universiti Teknologi Mara, UiTM Press.
23. Ayandibu, A. O., & Houghton, J. (2017). The role of Small and Medium Scale Enterprise in local economic development (LED). *Banach Journal of Mathematical Analysis*, 11(2), 133-139.
24. Baabdullah, A. M., Alalwan, A. A., Slade, E. L., Raman, R., & Khatatneh, K. F. (2021). SMEs and artificial intelligence (AI): Antecedents and consequences of AI-based B2B practices. *Industrial Marketing Management*, 98, 255-270.
25. Bachmann, J. T., Ohlies, I., & Flatten, T. (2021). Effects of entrepreneurial marketing on new ventures' exploitative and exploratory innovation: The moderating role of competitive intensity and firm size. *Industrial Marketing Management*, *92*, 87-100.
26. Baker, M. (2020). Gartner survey reveals 82% of company leaders plan to allow employees to work remotely some of the time. *Gartner Survey Reveals*, 82.
27. Baker, W. E., & Sinkula, J. M. (2019). In search of sustainable advantage: An empirical investigation of the innovation–value link. *Journal of the Academy of Marketing Science*, 47(4), 689-706.
28. Bandara, K. B. T. U. K., Jayasundara, J. M. S. B., Naradda Gamage, S. K., Ekanayake, E. M. S., Rajapackshe, P. S. K., Abeyrathne, G. A. K. N. J., & Prasanna, R. P. I. R. (2020). *Entrepreneurial marketing & performance of small & medium enterprises in developed and developing economies: a conceptual exploration.*
29. Bansal, P. (2005). Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic Management Journal*, 26(3), 197-218.
30. Barnney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.
31. Basri, W. (2020). Examining the impact of artificial intelligence (AI)-assisted social media marketing on the performance of small and medium enterprises: toward effective business management in the Saudi Arabian context. *International Journal of Computational Intelligence Systems*, *13*(1), 142.
32. Becherer, R. C., Helms, M. M., & McDonald, J. P. (2012). The effect of entrepreneurial marketing on outcome goals in SMEs. *New England Journal of Entrepreneurship*, *15*(1), 7-18.,

33. Biesok, & Wyród-Wróbel, J. (2011). Customer satisfaction-Meaning and methods of measuring. *Marketing and Logistic Problems in the Management of Organization, Wydawnictwo Akademii Techniczno-Humanistycznej W Bielsku-Białej, Bielsko-Biała*, 23-41.
34. Blomkvist, K., Kappen, P., & Zander, I. (2017). Gone are the creatures of yesteryear? On the diffusion of technological capabilities in the 'modern'MNC. *Journal of World Business*, *52*(1), 1-16.
35. Bloom, N., et al. (2015). Does working from homework? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1), 165-218.
36. Bloom, N., Sadun, R., & Van Reenen, J. (2015). Does working from homework? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1), 165-218.
37. Brynjolfsson, E., & McAfee, A. (2017). The business of artificial intelligence. Harvard Business Review, 95(1), 91-100.
38. Brynjolfsson, E., & McAfee, A. (2022). The second machine age: Work, progress, and prosperity in a time of brilliant technologies. *WW Norton & Company*.
39. Bughin, J., et al. (2017). Artificial intelligence: The next digital frontier? *McKinsey Global Institute*.
40. Bughin, J., Hazan, E., Ramaswamy, S., Chui, M., Allas, T., Dahlström, P., ... & Henke, N. (2017). Artificial intelligence: The next digital frontier? *McKinsey Global Institute.*
41. Burt, R. S. (2017). Structural holes versus network closure as social capital. In Social capital (pp. 31-56). Routledge.
42. Byrne, B. M. (2013). Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming. Routledge. https://doi.org/10.4324/9781410600219
43. Cacciolatti, L., & Lee, S. H. (2015). *Entrepreneurial marketing for SMEs. Springer.*
44. Camilleri, M. A., & Filieri, R. (2023). Customer satisfaction and loyalty with online consumer reviews: Factors affecting revisit intentions. *International Journal of Hospitality Management*, 114, 103575.
45. Camisón, C., & Villar-López, A. (2014). Organizational innovation as an enabler of technological capabilities and firm performance. *Journal of business research, 67(1), 2891-2902.*
46. Carr, A., & Lopez, R. (2020). Customer-Centric Entrepreneurial Marketing: A Catalyst for Financial Performance. *Journal of Business Strategy*, 38(4), 87-104.
47. Chen, D., Esperança, J. P., & Wang, S. (2022). The impact of artificial intelligence on firm performance: an application of the resource-based view to e-commerce firms. *Frontiers in Psychology*, *13*, 884830.
48. Chen, Y., Green, P., & Ko, C. (2020). The impact of strategic flexibility on the relationship between entrepreneurship and firm performance: A configurational perspective. Journal of Business Research, 106, 287-298.
49. Chesbrough, H. (2010). Business model innovation: Opportunities and barriers. Long range planning, 43(2-3), 354-363.

50. Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295(2), 295-336.
51. Christmann, P., & Taylor, G. (2001). Globalization and the environment: Determinants of firm self-regulation in China. *Journal of International Business Studies*, 32(3), 439-458.
52. Christmann, P., & Taylor, G. (2006). Firm self-regulation through international certifiable standards: Determinants of symbolic versus substantive implementation. *Journal of International Business Studies*, 37(6), 863-878.
53. Clarke, V., Braun, V., & Hayfield, N. (2015). *Thematic analysis. Qualitative psychology: A practical guide to research methods, 3, 222-248.*
54. Cohen, J. (1988). Statistical power analysis for the behavioral sciences, 2nd ed. Hillsdale, NJ: Erlbaum.
55. Country Watch. (2015). Country Review: Sudan. Retrieved from http://www.countrywatch.com.
56. Coviello, N. E., McDougall, P. P., & Oviatt, B. M. (2017). Reconsidering the Dark Side of Marketing and Entrepreneurship Relationships. *Journal of Business Venturing Insights*, 7, 26-30.
57. Crick, J. M., Crick, D., & Chaudhry, S. (2020). Entrepreneurial marketing decision-making in rapidly internationalising and de-internationalising start-up firms. *Journal of Business Research*, *113*, 158-167.
58. Crockett, S. A. (2012). A five-step guide to conducting SEM analysis in counseling research. Counseling Outcome Research and Evaluation, 3(1), 30-47.
59. Damanpour, F. (2014). Footnotes to research on management innovation. *Organization Studies*, 35(9), 1265-1285.
60. Danneels, E. (2002). The dynamics of product innovation and firm competences. *Strategic Management Journal*, 23(12), 1095-1121.
61. Davenport, T. H., & Pearlson, K. E. (1998). Two cheers for the virtual office. *Sloan Management Review*, 39(4), 51-65.
62. David, Norris., Malgorzata, Ciesielska. (2019). Towards a framework for innovation orientation within business and management studies: *A systematic review and paths for future research. Journal of Organizational Change Management,* doi: 10.1108/JOCM-02-2018-0051
63. De Loecker, J., & Goldberg, P. K. (2014). Firm performance in a global market. Annu. Rev. Econ., 6(1), 201-227.
64. De Mendonca, T. R., & Zhou, Y. (2019). Environmental performance, customer satisfaction, and profitability: A study among large US companies. *Sustainability*, *11*(19), 5418.
65. Dholakia, U. M., Blazevic, V., Wiertz, C., & Algesheimer, R. (2010). Communal service innovation: How an organic perspective helps to understand users' adoption of social technology. *Journal of Service Research*, 13(1), 3-20.
66. Dowd, K. (2002). Measuring market risk (Vol. 1). John Wiley & Sons.

67. Eggers, F., Niemand, T., Kraus, S., & Breier, M. (2020). Developing a scale for entrepreneurial marketing: Revealing its inner frame and prediction of performance. *Journal of Business Research*, *113*, 72-82.
68. Elkington, J. (1997). Cannibals with forks: The triple bottom line of 21st century business. Capstone.
69. Etemad, H., & Lee, Y. (2001). Technological capabilities and industrial concentration in NICs and industrialized countries: Taiwanese SMEs versus South Korean chaebols. *International Journal of Entrepreneurship and Innovation Management, 1(3-4), 329-355.*
70. Falk, R. F., et Miller, N. B. (1992). A primer for soft modeling. *University of Akron Press.*
71. Ferna, E., & Garcı, F. (2012). Learning from exporting: The moderating effect of technological capabilities.
72. Fornell, C. (1992). A national customer satisfaction barometer: The Swedish experience. *The Journal of Marketing*, 56(1), 6-21.
73. Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, 18, 382-388. http://dx.doi.org/10.2307/3150980
74. Fourie, L. (2015). Customer satisfaction: a key to survival for SMEs. *Problems and Perspectives in Management*, 13(3), 181-188.
75. Füller, J., Jawecki, G., Mühlbacher, H., & Matzler, K. (2009). Innovation creation by online basketball communities. *Journal of Business Research*, 62(12), 1089-1096.
76. Gabriela, Maria, Gliga., Natasha, Evers. (2023). Marketing capability development through networking – An entrepreneurial marketing perspective. Journal of business research, doi: 10.1016/j.jbusres.2022.113472
77. Gangi, Y. A., & Mohammed, H. E. (2017). The development of entrepreneurship in Sudan. *Entrepreneurship in Africa*, 209-231.
78. Garson, G. D. (2016). Partial least squares (PLS-SEM): *Regression and structural equation models*. North Carolina: Statistical Publishing Associates.
79. Gilmore, A., & Carson, D. (1999). Entrepreneurial marketing by networking. *New England Journal of Entrepreneurship*, 2(2), 31.
80. Golden, T. D., & Gajendran, R. S. (2021). Remote work: A framework for research. *Academy of Management Annals*, 15(1), 346-380.
81. Golden, T. D., & Veiga, J. F. (2005). The impact of extent of telecommuting on job satisfaction: Resolving inconsistent findings. *Journal of Management*, 31(2), 301-318.
82. Gunday, G., Ulusoy, G., Kilic, K., & Alpkan, L. (2011). Effects of innovation types on firm performance. *International Journal of production economics*, *133*(2), 662-676.
83. Gupta, A. K., & Gupta, N. (2020). Effect of corporate environmental sustainability on dimensions of firm performance–Towards sustainable development: Evidence from India. *Journal of cleaner production*, *253*, 119948.

84. Gurayah, J. R. (2023). Entrepreneurial business ethics and good governance. *In Research Anthology on Business Law, Policy, and Social Responsibility* (Vol. 1-4, pp. 503- 519). https://doi.org/10.4018/979-8-3693-2045-7.ch027.

85. Hacioglu, G., Eren, S. S., Eren, M. S., & Celikkan, H. (2012). The effect of entrepreneurial marketing on firms' innovative performance in Turkish SMEs. *Procedia-Social and Behavioral Sciences*, *58*, 871-878.,

86. Haeussler, C., Patzelt, H., & Zahra, S. A. (2012). Strategic alliances and product development in high technology new firms: The moderating effect of technological capabilities. *Journal of business venturing*, *27*(2), 217-233.

87. Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM). Sage publications.

88. Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Partial least squares structural equation modeling (PLS-SEM) using R: A workbook (p. 197). *Springer Nature.*

89. Hair, J. F., Black, B., Babin, B., Anderson, R. E., & Tath, R. L. (2010). Multivariate data analysis. Prentice Hall. Inc. *Upper Saddle River*, NJ, USA.

90. Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2019) Multivariate data analysis. Eighth edition edn. Andover, Hampshire, UK: Cengage Learning, EMEA.

91. Hallbäck, J., & Gabrielsson, P. (2013). Entrepreneurial marketing strategies during the growth of international new ventures originating in small and open economies. *International Business Review*, *22*(6), 1008-1020.

92. Hamad, A. Y. A. (2019), The moderating effect of technological capabilities in the relationship between strategic orientation and service innovation to enhance operational performance in Sudanese services firms p (39-44).

93. Hamali, S., Suryana, Y., Effendi, N., & Azis, Y. (2016). Influence of entrepreneurial marketing toward innovation and its impact on business performance: A survey on small Industries of Wearing Apparel in West Java, Indonesia. *International Journal of Economics, Commerce and Management*, *4*(8).

94. Hanin, Damer., Shafig, Al-Haddad., Ra'ed, Masa'deh., Muhammad, Alshurideh. (2022). *Entrepreneurial Marketing:* An Approach-Based Paradigm Shift to Marketing. Studies in computational intelligence, doi: 10.1007/978-3-031-12382-5_85.

95. Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, 20(4), 986-1014.

96. Heidi, Korhonen. (2015). Customer Orientation in Industrial Service Innovation - Deepening the Understanding on Customers, Needs, Involvement, and Value

97. Helfat, C. E., & Peteraf, M. A. (2009). Understanding dynamic capabilities: progress along a developmental path. *Strategic organization*, *7*(1), 91-102.

98. Helfat, C. E., & Raubitschek, R. S. (2000). Product sequencing: co-evolution of knowledge, capabilities, and products. *Strategic Management Journal*, 21(10-11), 961-979.).

99. Henseler, J., Ringle, C. M., et Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1), 115-135.

100. Hewing, M. (2013). Business process blueprinting: A method for customer-oriented business process modeling. *Springer Science & Business Media.*

101. Hills, G. E., & Hultman, C. (2013). Entrepreneurial marketing: Conceptual and empirical research opportunities. *Entrepreneurship Research Journal*, *3*(4), 437-448.

102. Hills, G. E., & Hultman, C. M. (2011). Academic roots: The past and present of entrepreneurial marketing. *Journal of Small Business & Entrepreneurship*, *24*(1), 1-10.

103. Hillson, D. (2019). Managing risk in projects. Routledge.

104. Hisrich, R. D., & Ramadani, V. (2017). Effective entrepreneurial management. *Strategy, Planning, Risk.*

105. Holmes, C., & Jorlöv, K. (2015). Entrepreneurial marketing: a descriptive study of Swedish charitable organizations.

106. Hooley, G., Greenley, G., Fahy, J., & Cadogan, J. (2001). Market-focused resources, competitive positioning and firm performance. *Journal of marketing Management*, *17*(5-6), 503-520.

107. Houdmont, J., & Kerr, R. (2017). Occupational health and the gig economy: What are the key challenges? Occupational Medicine, 67(5), 308-310.

108. https://gs.statcounter.com/social-media-stats/all/sudan

109. Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management*, 33(5), 429-438.

110. Hultman, M., & Shaw, E. (2017). Entrepreneurial marketing in small firms: A conceptual exploration. *International Small Business Journal*, 35(7), 747-768.

111. Hultman, M., & Shaw, J. (2021). Proactive Entrepreneurial Marketing: Unleashing Innovation and Value Creation. *Journal of Marketing Innovation*, 25(3), 45-62.

112. Ionita, D. (2012). Entrepreneurial marketing: a new approach for challenging times. *Management & Marketing*, 7(1), 131.

113. Jack, S. L., Dodd, S. D., & Anderson, A. R. (2011). Change and the development of entrepreneurial networks over time: A processual perspective. *Entrepreneurship & Regional Development*, 23(7-8), 517-540.

114. Jayawarna, D., Jones, O., & Macpherson, A. (2014). Entrepreneurial potential: The role of human and cultural capitals. *International Small Business Journal*, *32*(8), 918-943.

115. Johannisson, B. (1988). Business formation–a network approach. *Scandinavian Journal of Management*, 4(3-4), 83-99.

116. Josh Siepel, Marcus Dejardin. How do we measure firm performance? A review of issues facing entrepreneurship researchers. 2020. ffhalshs-02571478

117. Khattab, I., Ahmed, A. M., & Al-Magli, O. O. (2019). The Effect of E-banking Channels on Employees' Daily Activities and Workload. *Banking and Financial Studies*, *34*, 9-44.

118. Kijkasiwat, P., & Phuensane, P. (2020). Innovation and firm performance: The moderating and mediating roles of firm size and small and medium enterprise finance. *Journal of Risk and Financial Management*, *13*(5), 97.

119. Kilenthong, P., Hills, G. E., & Hultman, C. M. (2015). An empirical investigation of entrepreneurial marketing dimensions. *Journal of International Marketing Strategy*, *3*(1), 1-18.

120. Kock, N. (2016). Hypothesis testing with confidence intervals and P values in PLS-SEM. International Journal of e-Collaboration (IJeC), 12(3), 1-6.

121. Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: the construct, research propositions, and managerial implications. *Journal of marketing*, *54*(2), 1-18.

122. Kotler, P. (2012). *Kotler on marketing. Simon and Schuster.*

123. Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on entrepreneurial intentions—Investigating the role of business experience. *Journal of Business Venturing*, 25(5), 524-539.

124. Kumar, V., Dalla Pozza, I., Petersen, J. A., & Shah, D. (2009). Reversing the logic: The path to profitability through relationship marketing. *Journal of Interactive Marketing*, *23*(2), 147-156.

125. Kura, A. B. (2019). Influence of Marketing Research Application on Customer Attraction, Customer Satisfaction and Retention in Small and Medium Scale Enterprises in Borno State, Nigeria (Doctoral dissertation, Kwara State University (Nigeria)

126. Lam, W., & Harker, M. J. (2015). Marketing and entrepreneurship: An integrated view from the entrepreneur's perspective. *International Small Business Journal*, *33*(3), 321-348.

127. Lee, D. K. (2016). Alternatives to P value: confidence interval and effect size. Korean journal of anesthesiology, 69(6), 555-562.

128. Lee, G. G., & See, K. E. (2004). Trust in automation: Designing for appropriate reliance. Human Factors: *The Journal of the Human Factors and Ergonomics Society*, 46(1), 50-80.

129. Lichtenthaler, U. (2011). Open innovation: Past research, current debates, and future directions. *Academy of Management Perspectives*, 25(1), 75-93.

130. Lichtenthaler, U., & Lichtenthaler, E. (2009). A capability-based framework for open innovation: Complementing absorptive capacity. *Journal of Management Studies*, 46(8), 1315-1338.

131. M.J., Ramos-Peralonso. (2021). *Risk management*. doi: 10.1016/b978-0-12-824315-2.00036-1

132. Madhani, P. M. (2010). Resource based view (RBV) of competitive advantage: an overview. *Resource based view: concepts and practices, Pankaj Madhani, ed*, 3-22.

133. Magre, Sunita, Vithalrao., Beena, Khemchandani. (2011). Customer Orientation - A Study.

134. Majovski, I., & Davitkovska, E. (2017). ENTREPRENURIAL MARKETING MANAGEMENT: THE NEW PARADIGM. *Economic Development/Ekonomiski Razvoj*, *19*.

135. Marcuse, P. (1998). Sustainability is not enough. *Environment and urbanization*, 10(2), 103-112.

136. Martin, D. M. (2009). The entrepreneurial marketing mixes. *Qualitative market research: an international journal*, *12*(4), 391-403.

137. Matthysee, P. (2019). The Role of Risk-Taking in Entrepreneurial Marketing: An Innovation and Differentiation Perspective. *International Journal of Entrepreneurial Studies*, 12(2), 105-120.

138. Miguel, Díaz-Canel, Bermúdez., Mercedes, Delgado, Fernández. (2020). *Modelo de gestión del gobierno orientado a la innovación*

139. Miles, M. P., & Darroch, J. (2006). Large firms, entrepreneurial marketing processes, and the cycle of competitive advantage. *European journal of marketing*.

140. Miocevic, D., Crnjak-Karanovic, B., Mitic, S., & Svento, R. (2017). The Impact of E-Marketing Capability on Export Performance: The Moderating Role of Exporting Experience. *Journal of Business and Industrial Marketing*, 32(6), 809-819.

141. Mithas, S., & Rust, R. T. (2016). How information technology strategy and investments influence firm performance. Mis Quarterly, 40(1), 223-246.

142. Mohammed, Saleh, Alosani., Hassan, Saleh, Al-Dhaafri., Nasr, Mohammed, Mousa. (2022). Innovation orientation and government service innovation: an empirical investigation on the UAE government agencies. *International Journal of Innovation Science*, doi: 10.1108/ijis-04-2022-0081.

143. Morgan, N. A., Vorhies, D. W., & Mason, C. H. (2020). Market orientation, marketing capabilities, and firm performance. *Strategic Management Journal*, 41(1), 130-154.

144. Morris, M. H., Schindehutte, M., & LaForge, R. W. (2001, August). The emergence of entrepreneurial marketing: Nature and meaning. In *15th Annual UIC Research Symposium on Marketing and Entrepreneurship* (pp. 91-104),

145. Morris, M. H., Schindehutte, M., & LaForge, R. W. (2002). Entrepreneurial marketing: a construct for integrating emerging entrepreneurship and marketing perspectives. *Journal of marketing theory and practice*, *10*(4), 1-19.

146. Morris, M. H., Webb, J. W., & Franklin, R. J. (2011). Understanding the manifestation of entrepreneurial orientation in the nonprofit context. *Entrepreneurship theory and practice*, *35*(5), 947-971.

147. Morrish, S. C. (2011). Entrepreneurial marketing: a strategy for the twenty-first century? *Journal of Research in Marketing and Entrepreneurship*.

148. Morrish, S. C., Miles, M. P., & Deacon, J. H. (2010). Entrepreneurial marketing: acknowledging the entrepreneur and customer-centric interrelationship. *Journal of Strategic Marketing*, *18*(4), 303-316.

149. Morshedizadeh, M., Kordestani, M., Carriveau, R., Ting, D. S. K., & Saif, M. (2018). Power production prediction of wind turbines using a fusion of MLP and ANFIS networks. *IET Renewable Power Generation*, *12*(9), 1025-1033.

150. Motamarri, S., Akter, S., Hossain, M. A., & Dwivedi, Y. K. (2022). How does remote analytics empowerment capability payoff in the emerging industrial revolution? Journal of Business Research, 144, 1163-1174.).

151. Mpanza, P. (2016). *Assessing the impact of forms of entrepreneurial capital on Corporate Entrepreneurship in State-Owned Enterprises* (Doctoral dissertation).

152. Mugano, G. (2023) Role of SMEs in Economic Development in Africa. *In SMEs and Economic Development in Africa* (pp. 1-16). https://doi.org/10.4324/9781003413172-1.

153. Nafissa, Omar., M, El-Zoghby., Ahmed, Mohamed, Emam, Emam. (2022). Role of Innovation Orientation in Building a Competitive Advantage in the Egyptian Hotels. *Journal of Association of Arab Universities for Tourism and Hospitality (JAAUTH) (Print),* doi: 10.21608/jaauth.2022.155312.1385.

154. Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.

155. Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, 54(4), 20-35.

156. Natalia, A., Tsareva., Sofiya, Yu., Omelyanenko. (2020). Remote work: development of employee digital competence. Revista de la Universidad del Zulia, doi: 10.46925//RDLUZ.31.10.

157. Nouri, P., Imanipour, N., Talebi, K., & Zali, M. (2018). Exploring positive outcomes of decision-making biases in the field of entrepreneurial marketing. *The Qualitative Report, 23(6), 1364-1380.*

158. Nuning, Kristiani. (2023). *Entrepreneurial Marketing Dalam Kajian Filsafat Ilmu. Capital,* doi: 10.25273/capital. v6i2.15803].

159. Nwankwo, C., & Kanyangale, M. I. (2020). The Strategic Role of Entrepreneurial Marketing in Small and Medium Enterprises. *Acta Universitatis Danubius. Œconomica*, *16*(4).

160. Obstfeld, D. (2005). Social networks, the Tertius Iungens orientation, and involvement in innovation. *Administrative Science Quarterly*, 50(1), 100-130.

161. O'laoire, D., & Welford, R. (2014). *The EMS in the SME. in Corporate Environmental Management* 1: Systems and Strategies, Second Edition (pp. 199-209). https://doi.org/10.4324/9781315071268-20

162. Ortega, M. J. R. (2010). Competitive strategies and firm performance: Technological capabilities' moderating roles. *Journal of business research*, *63*(12), 1273-1281.

163. Osman, E. D., Berhe, D. F., Shimels, T., Bilal, A. I., & Tilahun, Z. (2018). Generic medicine perception among physicians and pharmacists: a myth that harms the poor A qualitative study in Addis Ababa, Ethiopia. *Sudan Med J*, *54*(3), 200-208.

164. Ozkaya, H. E., Droge, C., M. Hult, G. T., Calantone, R., & Ozkaya, E. (2015). Market orientation, knowledge competence, and innovation. *International Journal of Research in Marketing*, 32(3), 309-318.

165. Ozkul, F., & Yaprak, A. (2018). Efficient Resource Leveraging in Entrepreneurial Marketing: Optimizing Time, Money, and Human Capital. *Journal of Business Efficiency*, 34(1), 112-129.

166. Pallant, J. (2020). SPSS Survival Manual: A Step-by-Step Guide to Data Analysis Using IBM SPSS. London: *McGraw-Hill, Open University Press*. https://doi.org/10.4324/9781003117452

167. Parasuraman, A., & Grewal, D. (2000). The impact of technology on the quality-value-loyalty chain: A research agenda. *Journal of the Academy of Marketing Science*, 28(1), 168-174.

168. Peattie, S., & Peattie, K. (2003). Ready to fly solo? Reducing the ecological footprint of UK households. *Business Strategy and the Environment*, 12(1), 36-48.

169. Prahalad, C. K., & Hammond, A. (2002). Serving the world's poor, profitably. *Harvard Business Review*, 80(9), 48-57.

170. PwC. (2017). Sizing the prize: What's the real value of AI for your business and how can you capitalize? PwC AI Report.

171. Ramadani, V., Hisrich, R. D., Abazi-Alili, H., Dana, L. P., Panthi, L., & Abazi-Bexheti, L. (2019). Product innovation and firm performance in transition economies: A multi-stage estimation approach. *Technological Forecasting and Social Change*, *140*, 271-280).

172. Ramadani, V., Rexhepi, G., Gërguri-Rashiti, S., Ibraimi, S., & Dana, L. P. (2014). Ethnic entrepreneurship in Macedonia: the case of Albanian entrepreneurs. *International Journal of Entrepreneurship and Small Business*, *23*(3), 313-335.

173. Ranhua, Wang. (2022). Development of Entrepreneurial Marketing: *A Theory-Based Qualitative Analysis. Highlights in Business, Economics and Management*, doi: 10.54097/hbem.v2i.2384

174. Ransbotham, S., Khodabandeh, S., Fehling, R., LaFountain, B., & Kiron, D. (2019). Winning with AI. *MIT Sloan management review*.

175. Rashad, N. M. (2018). The impact of entrepreneurial marketing dimensions on the organizational performance within Saudi SMEs. *Eurasian Journal of Business and Management*, *6*(3), 61-71.

176. Reichheld, F. F., & Sasser, W. E. Jr. (1990). Zero defections: Quality comes to services. *Harvard Business Review*, 68(5), 105-111.

177. Ringle, C., Da Silva, D., & Bido, D. (2015). Structural equation modeling with the SmartPLS. Bido, D., da Silva, D., & Ringle, C. (2014). Structural Equation Modeling with the Smartpls. *Brazilian Journal of Marketing*, 13(2).

178. Ritala, P., Hurmelinna-Laukkanen, P., & Blomqvist, K. (2010). Coopetition-based business models: The case of Amazon.com. *Industrial Marketing Management*, 39(5), 742-752.

179. Ritter, T., Wilkinson, I. F., & Johnston, W. J. (2002). Measuring network competence: some international evidence. *Journal of Business & Industrial Marketing*, 17(2/3), 119-138.

180. Rößl, D., Kraus, S., Fink, M., & Harms, R. (2009). Entrepreneurial marketing: geringer mitteleinsatz mit hoher wirkung. *Marketing Review St. Gallen, 26*(1), 18-22.

181. Rushe and Waples, (2008) *The share price is not something we control. We control innovation, sales and profits.*

182. Russell, S., & Norvig, P. (2022). Artificial Intelligence: A Modern Approach. Pearson.

183. Rust, R. T., Lemon, K. N., & Zeithaml, V. A. (2004). Return on marketing: Using customer equity to focus marketing strategy. *Journal of Marketing*, 68(1), 109-127.

184. Sadiku-Dushi, N., Dana, L. P., & Ramadani, V. (2019). Entrepreneurial marketing dimensions and SMEs performance. *Journal of Business Research, 100*, 86-99.

185. Sainaghi, R., & Phillips, P. (2014). The role of internal branding in the delivery of employee brand promise. *International Journal of Hospitality Management*, 39, 45-57.

186. Saini, A., & Budhwar, P. (2021). Entrepreneurial orientation, knowledge acquisition, and business performance: *Evidence from India. Journal of Business Research,* 122, 33-43.

187. Santos, J. B., & Brito, L. A. L. (2012). Toward a subjective measurement model for firm performance. *BAR-Brazilian Administration Review, 9*, 95-117.

188. Sarstedt, M., C.M. Ringle, and J.F. Hair. 2017. Treating unobserved heterogeneity in PLS-SEM: A multi-method approach. In Partial least squares path modeling: Basic concepts, methodological issues and applications, ed. H. Latan and R. Noonan, 197–217. Heidelberg: Springer.

189. Schrettle, S., Hinz, A., Scherrer-Rathje, M., & Friedli, T. (2014). Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance. *International Journal of Production Economics*, 147, 73-84.

190. Sekaran, U. (2006). Research methods for business. New York: John Wiley & Sons Inc.

191. Sekeran .2003, research method for business, A Skill-Building Approach Fourth Edition, ISBN 0-471-20366-1 -ISBN 0-471-38448-8 (WIE).

192. Selvam, M., Gayathri, J., Vasanth, V., Lingaraja, K., & Marxiaoli, S. (2016). Determinants of firm performance: A subjective model. *Int'l J. Soc. Sci. Stud., 4*, 90.

193. Shanmugan, Joghee., Deepak, Kalra., Swamynathan, Ramakrishnan., K., Unnikrishnan, Nair., Ali, A., Alzoubi. (2023). *Digital Entrepreneurial Marketing Strategy:* An Empirical Analysis Using Resource Based Theory. doi: 10.1109/ICBATS57792.2023.10111356.

194. Sharma, R., & Kohli, S. (2019). Making Micro, Small and Medium Enterprises Competitive: Cluster Development Methodology. *In Energy, Environment and Globalization: Recent Trends, Opportunities and Challenges in India* (pp. 277- 290). https://doi.org/10.1007/978-981-13-9310-5_17.

195. Silva, L. R., et al. (2020). The role of artificial intelligence in promoting sustainable development: Opportunities, challenges, and risks. *Sustainability*, 12(11), 4507.

196. Simkins, B. J., & Menon, N. (2009). Is risk management associated with reduced operating risk? Journal of Banking & Finance, 33(5), 915-926.

197. Singh, N., Benmamoun, M., Meyr, E., & Arikan, R. H. (2021). Verifying rigor: analyzing qualitative research in international marketing. *International marketing review, 38(6), 1289-1307.*

198. Sonny, Nwankwo. (1995). Developing a customer orientation. Journal of Consumer Marketing, doi: 10.1108/07363769510103856

199. Srivastava, M. K., Gnyawali, D. R., & Hat, D. E. (2015). Technological Forecasting & Social Change Behavioral implications of absorptive capacity: The role of technological effort and technological capability in leveraging alliance network technological resources.

200. Stokes, A., & Wilson, E. (2009). Catering for individual student learning preferences in economics. *American Journal of Business Education (AJBE)*, *2*(9), 41-48.

201. Stokes, D. (2000). Putting entrepreneurship into marketing: the processes of entrepreneurial marketing. *Journal of research in marketing and entrepreneurship*.

202. Sun, Y., & Lee, E. (2022). Entrepreneurial marketing of small and medium-sized suppliers enhancing technological capability: lessons from industrial suppliers in South Korea. *International Journal of Entrepreneurial Behavior & Research*.

203. Symeonidou, N., Leiponen, A., Autio, E., & Bruneel, J. (2022). The origins of capabilities: Resource allocation strategies, capability development, and the performance of new firms. *Journal of Business Venturing*, *37*(4), 106208.

204. Tabachnick, B.G., Fidell, L.S. and Ullman, J.B. (2007) *Using multivariate statistics.* pearson Boston, MA.

205. Taghizadeh, S. K., Nikbin, D., Alam, M. M. D., Rahman, S. A., & Nadarajah, G. (2020). Technological capabilities, open innovation and perceived operational performance in SMEs: the moderating role of environmental dynamism. *Journal of Knowledge Management*.

206. Taouab, O., & Issor, Z. (2019). Firm performance: Definition and measurement models. *European Scientific Journal*, *15*(1), 93-106.

207. Tarigan, N. M. R., Sasongko, W. D., & Abdullah, Y. (2021). CO-CREATION THROUGH ENTREPRENEURIAL MARKETING: A STUDY AT THE CREATIVE INDUSTRIES. *Academy of Entrepreneurship Journal*, *27*(5), 1-8.

208. Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319-1350.

209. Teece, D. J. (2018). Dynamic capabilities and (digital) platform lifecycles. In Platforms, Markets and Innovation (pp. 95-118). *Edward Elgar Publishing*.

210. Teece, D. J. (2018). Profiting from innovation in the digital economy: Enabling technologies, standards, and licensing models in the wireless world. *Research Policy*, 47(8), 1367-1387.

211. Teece, D.J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.

212. Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. Computational statistics & data analysis, 48(1), 159-205.

213. Thomas, L. C., Painbéni, S., & Barton, H. (2013). Entrepreneurial marketing within the French wine industry. *International Journal of Entrepreneurial Behavior & Research*, *19*(2), 238-260.

214. Trott, P. (2008). *Innovation management and new product development. Pearson education*

215. Tzokas, N., Kim, Y. A., Akbar, H., & Al-Dajani, H. (2015). Absorptive capacity and performance: The role of customer relationship and technological capabilities in high-tech SMEs. *Industrial Marketing Management*, *47*, 134-142).

216. Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. Journal of Information Technology Theory and Application (JITTA), 11(2), 2.

217. Utomwen, M. (2024). Examining the Impact of Project Risk Management and Project Complexity on Project Success in the United States*: A Quantitative Regression Study* (Doctoral dissertation, Capella University).

218. Uwuigbe, U., Teddy, O., Uwuigbe, O. R., Emmanuel, O., Asiriuwa, O., Eyitomi, G. A., & Taiwo, O. S. (2018). Sustainability reporting and firm performance: *A bi-directional approach. Academy of Strategic Management* Journal, 17(3), 1-16.

219. V., Khurdei., Anna, Ildarovna, Skorobogatova. (2022). *Customerorientation in marketing activities of alcohol holding "global spirits"*. *Economic scope*, doi: 10.32782/2224-6282/184-22.

220. Vartiainen, M. (2021). Telework and remote work. In *Oxford research encyclopedia of psychology*. Oxford: Oxford University Press.

221. Wang, H. L. (2014). Theories for competitive advantage.

222. Wang, X., Wang, Z., Huang, Y., Liu, Y., Zhang, J., Heng, X., & Zhu, D. (2017). Identifying R&D partners through Subject-Action-Object semantic analysis in a problem & solution pattern. *Technology Analysis & Strategic Management*, *29*(10), 1167-1180.

223. Wang, Y., Lo, H. P., Zhang, Q., & Xue, Y. (2006). How technological capability influences business performance: An integrated framework based on the contingency approach. *Journal of Technology Management in China*.

224. Wang, Y., Lo, H. P., Zhang, Q., & Xue, Y. (2006). How technological capability influences business performance: An integrated framework based on the contingency approach. *Journal of Technology Management in China*.

225. Webster, J., & Martocchio, J. J. (1992). Microcomputer playfulness: Development of a measure with workplace implications. *MIS Quarterly*, 16(2), 201-226.

226. Westerlund, M., & Leminen, S. (2018). Does entrepreneurial marketing underrate competition? *Technology Innovation Management Review*, *8*(9).,

227. Wetzels, M., Odekerken-Schröder, G., & Van Oppen, C. (2009). Using PLS path modeling for assessing hierarchical construct models: *Guidelines and empirical illustration. MIS quarterly*, 177-195.

228. Whalen, P., Uslay, C., Pascal, V. J., Omura, G., McAuley, A., Kasouf, C. J., ... & Deacon, J. (2016). Anatomy of competitive advantage: towards a contingency theory of entrepreneurial marketing. *Journal of Strategic Marketing*, *24*(1), 5-19.

229. Wong, K. K. K. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing bulletin*, 24(1), 1-32.

230. World Bank (2007). World Development Indicators 2007. *Washington DC.*

231. Wu, J. (2014). Cooperation with competitors and product innovation: Moderating effects of technological capability and alliances with universities. *Industrial Marketing Management*, *43*(2), 199-209.

232. Xin, Zhao. (2021). Customer Orientation: A Literature Review Based on Bibliometric Analysis. *SAGE Open*, *doi*: 10.1177/21582440221079804

233. Yee, R. W., Yeung, A. C., & Cheng, T. E. (2008). The impact of employee satisfaction on quality and profitability in high-contact service industries. *Journal of operations management*, 26(5), 651-668.

234. Yi, Y. (2016). Key marketing assets, their antecedents, and their impact on performance. *Journal of the Academy of Marketing Science*, 44(2), 142-160.

235. Zahra, S. A., & Garvis, D. M. (2000). International corporate entrepreneurship and firm performance: The moderating effect of international environmental hostility. *Journal of business venturing*, *15*(5-6), 469-492.

236. Zahra, S. A., & George, G. (2002). The net-enabled business innovation cycle and the evolution of dynamic capabilities. *Information systems research*, 13(2), 185-203.

237. Zahra, S. A., Matherne, B. P., & Carleton, J. M. (2003). Technological resource leveraging and the internationalization of new ventures. *Journal of International Entrepreneurship*, *1*(2), 163-186.

238. Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., ... & Li, Y. (2021). A Review of Artificial Intelligence (AI) in Education from 2010 to 2020. Complexity, 2021, 1-18.

239. Zhou, K. Z., & Wu, F. (2010). Technological capability, strategic flexibility, and product innovation. *Strategic management journal*, *31*(5), 547-561.

240. Zhu, Q., Sarkis, J., & Lai, K. H. (2016). Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. *Journal of Purchasing and Supply Management*, 22(2), 95-111.

APPENDICES

Appendix 1. The profile of the respondents from different Sudanese SMEs.

No	Participants	Position	Field	Location
1	Mini-FGDs, Female 2	Executive manager	Industry	Khartoum-SDN
2	Mini-FGDs, Male	Marketing Consultant	Industry-Giad motors	Khartoum-SDN
3	Mini-FGDs, Female 1	Associate professor	Service-University of Khartoum	Khartoum-SDN
4	Mutual interview Female 1	Associate professor	Service University of Khartoum	Khartoum-SDN
5	Mutual interview Female 2	Associate professor	Service University of Khartoum	Khartoum-SDN
6	1st Interview	An entrepreneur	Service Marketing Agency	Khartoum-SDN
7	2nd Interview	A lecturer	Service University of Kordofan	Khartoum-SDN
8	3rd Interview	Associate professor	Service University of Kordofan	Khartoum-SDN
9	FGDs, Female 1	An entrepreneur	Service Delivery	Khartoum-SDN
10	GGDs, Male 1	An entrepreneur	Industry- soap manufactory	Khartoum-SDN
11	FGDs, Male 2	Head of marketing	Service-Sudanese post company	Khartoum-SDN
12	FGDs, Female 2	Brand and communication professional	Service Sudani-telecom	Khartoum-SDN
13	2nd Mini-FGDs, Male 1	Representative of marketing and Sale Unit	Industry Giad motors	Khartoum-SDN
14	2nd Mini-FGDs, Female	Customer representative	Matiz factory For groceries	Khartoum-SDN
15	2nd Mini-FGDs, Male 2	Sales manager	Mhameed's furniture, décor and building supplies	Khartoum-SND

Appendix 2. Trustworthiness Verification: Qualitative Validity.

Measures of Trustworthiness	Methods and verification strategies
1. Credibility: • **Adequacy of the research methods and its components.**	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.
• **Triangulation of data method**	The researcher utilized multiple methods for collecting the data.
• **Triangulation of respondent**	The study employed respondents from different disciplines.
• **Reflective explanation**	The researcher considered the respondents' emergent thinking and impressions during the discussions.
1. **Transferability:** • **How effectively a single study's outcomes from one context will transfer to other contexts**	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.
2. **Dependability:**	We highlighted the numerous processes outlined in our methodology section and explicitly described our research processes to create an audit trail. 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.
3. **Confirmability:** • **Reflexive analysis**	The goal is to make sure that the results are independent from the researcher's biases. The researcher attempted to accurately record our concerns and biases throughout the study process as part of the reflective analysis.

Appendix 3: Original questionnaire items/statements before rotation matrix

Demographics/primary data	
Age, Gender, Qualification, Position, Firm size, and Sector	
Entrepreneurial marketing dimensions (Independent variable)	
1. innovation orientation IO	• Being innovative is a competitive advantage for my company. • My company's top management creates an atmosphere that encourages creativity and innovativeness. • We invent new products and services and regularly uses new distribution channels. • We frequently utilize new opportunities in new markets. • Our unit regularly uses new distribution channels.
2. Customer intensity CI	• Our business objectives are driven by customer satisfaction. • We pay close attention to after-sales service. • We ensure that business strategies in our company are driven by the goals of increasing customer value. • We make sure that our company's competitive advantage is based on understanding customers' needs. • We frequently measure our company's customer satisfaction.
3. Risk management RM	• My business would rather accept a risk to pursue an opportunity than miss it altogether. • My business is willing to take risks when we think it will benefit the company. • We encourage people in our company to take risks with new ideas. • We engage in risky investments (e.g., new 3s, facilities, debt, stock options) to stimulate future growth.
4. Networking	• I encourage my team to strive for innovative approaches to creating relationships with customers. • Overall, my firm is competent in dealing with inter-organizational relationships and networks. • In our firm we have a good relationship with each other and an important people in other firms. • We are experienced in dealing with technical partners.
Technological capabilities dimension (Moderator variable)	
	• I have reliable internet connection at my remote work location. • Our company provide a type of devices for remote work (e.g., laptop, desktop, tablet)

1. Remote Work Capability RWC	• We have access to the necessary software/tools for remote collaboration and communication (e.g., video conferencing, project management tools) • I have dedicated workspace at home for remote work. • How comfortable are you with verbal communication (phone, video calls) for work purposes?
2. Artificial Intelligent AI	• Our organization employ AI technologies in the operation. • We have received enough information about the benefits of using AI technologies. • Using AI technologies will generate a high volume of sales and will increase our market share. • AI technologies will strengthen our relationship and commitment to our business customers. • Using AI applications will generate a high volume of sales and will increase our market share.
Firm Performance FP dimensions (Dependent variable)	
1. Profitability	• Our company invest in return on assets as a main resource to maximize profitability. • Our company invest in return of sales as a main resource to maximize profitability. • Our company invest in return on investment as a key resource to maximize profitability. • Our company invest in numerous activities to maximize overall profitability. • Maximizing profitability of the firm encourages shareholder to expand the investments.
2. Sustainability:	• We deploy new manufacturing technologies to make manufacturing processes more sustainable, • We give extraordinary importance to the development of green products. • We give an attention the integration of green practices in the supply chain. • We regularly dispose of production waste to reduce environmental pollution.
3. Presumed Customers Satisfaction PCS	• Our customers are satisfied with the price of their purchased product(s) or services in this company. • Our customers are satisfied with the enquiry service provided by this company. • Our customers are satisfied with the customer service in transactions. • Our customers are satisfied with the service of handling customer dissatisfaction in this company. • Our customers are satisfied with…We analyze and respond to feedback and comments from customers.

Appendix 4. Questionnaire items/statements after rotation matrix

Entrepreneurial marketing measurements		
Dimension	**Measurements Code**	**Measurements after execution of PCA & rotation matrix**
Innovation Orientation	CI1	Our business objectives are driven by customer satisfaction.
	IO1	Being innovative is a competitive advantage for my company.
	CI4	We make sure that our company's competitive advantage is based on understanding customers' needs.
	Net3	In our firm we have a good relationship with each other and an important people in other firms.
	Net1	I encourage my team to strive for innovative approaches to creating relationships with customers.
Customer intensity	CI5	We frequently measure our company's customer satisfaction.
	Net4	We are experienced in dealing with technical partners.
	CI2	We pay close attention to after-sales service.
Risk management	IO3	We invent new products and services and regularly uses new distribution channels.
	RM1	My business would rather accept a risk to pursue an opportunity than miss it altogether.
	RM2	My business is willing to take risks when we think it will benefit the company.
Networking	IO2	My company's top management creates an atmosphere that encourages creativity and innovativeness.
	IO5	Our unit regularly uses new distribution channels.
	IO4	We frequently utilize new opportunities in new markets.
Technological capabilities measurements		
Remote work capability *)*	RWC1	I have reliable internet connection at my remote work location.
	RWC2	Our company provide a type of devices for remote work (e.g., laptop, desktop, tablet)
	RWC3	We have access to the necessary software/tools for remote collaboration and communication (e.g., video conferencing, project management tools)
Artificial intelligence	AI1	Our organization employ AI technologies in the operation.
	AI5	Using AI applications will generate a high volume of sales and will increase our market share.
	AI3	Using AI technologies will generate a high volume of sales and will increase our market share.

Firm performance measurements		
Profitability	PCS5	Our customers are satisfied with…We analyze and respond to feedback and comments from customers.
	PCS2	Our customers are satisfied with the enquiry service provided by this company.
	Su4	We regularly dispose of production waste to reduce environmental pollution.
Sustainability	Su3	We give an attention the integration of green practices in the supply chain.
	P5	Maximizing profitability of the firm encourages shareholder to expand the investments.
	P1	Our company invest in return on assets as a main resource to maximize profitability.
Presumed customer satisfaction.	PCS4	Our customers are satisfied with the service of handling customer dissatisfaction in this company.
	PCS1	Our customers are satisfied with the price of their purchased product(s) or services in this company.
	PCS3	Our customers are satisfied with the customer service in transactions.

Appendix 5. SMEs and respondent's frequencies.

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

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 employees)	147	57.6%
Sector	Services	149	58.4%
	Industrial	106	41.6%
Total		**255**	**100%**

Own creation by researcher (2024)