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**The Impact of Dynamic Capabilities on Small and Medium-sized Enterprises  
(SMEs) Performance in Oman**

**A Dissertation**

**Submitted to the Graduate Faculty of the  
University of South Alabama  
in partial fulfillment of the  
requirements for the degree of**

**Doctor of Philosophy in Business Administration**

**in**

**Management**

**by**

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**December 2022**

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## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	vii
LIST OF FIGURES .....	ix
LIST OF ABBREVIATIONS.....	x
ABSTRACT.....	xii
CHAPTER I: INTRODUCTION.....	1
1.1 Research Focus, Objective, and Relevance of Research.....	1
1.2 Structure of the Thesis.....	9
CHAPTER II: LITERATURE REVIEW .....	10
2.1 Firm Performance (FP) .....	10
2.2 Entrepreneurial Knowledge (EK) .....	12
2.3 Dynamic Capabilities (DCs).....	14
2.3.1 Reviewing Opportunities Literature .....	15
2.3.1.1 Opportunity Recognition (OR). .....	17
2.3.1.2 Opportunity Exploitation (OE). .....	18
2.4 SMEs in Oman.....	18
CHAPTER III: THEORETICAL MODEL AND HYPOTHESES .....	20
3.1 Resource-Based View (RBV).....	20
3.1.1 Direct Relationships .....	21
3.1.1.1 Entrepreneurial Knowledge and Opportunities. ....	21
3.1.1.2 Entrepreneurial Knowledge and Performance. ....	24

3.2 Indirect Relationships (Mediating effects).....	25
3.3 Moderated Relationships .....	26
 CHAPTER IV: METHODOLOGY .....	 29
4.1 Study Sample, Location, and Research Design.....	29
4.2 Data Sources and Collection Procedure .....	30
4.3 Translations, Pre-test, and Pilot Study Procedure .....	31
4.4 Measures.....	32
4.5 Data Analysis .....	35
 CHAPTER V: RESULTS .....	 37
5.1 Descriptive Statistics.....	37
5.2 PLS-SEM ANALYSIS .....	38
5.2.1 The Concept of Reflective-Reflective HOCs .....	40
5.2.1.1 LOCs Measurement Model Assessment.....	41
5.2.1.2 HOCs Measurement Model Assessment. ....	49
5.2.1.3 Structural Model Assessment. ....	56
 CHAPTER VI: DISCUSSION AND CONCLUSIONS.....	 66
6.1 Summary and Discussion of the Results.....	66
6.2 Theoretical Implications .....	68
6.3 Practical Implications.....	71
6.4 Limitations and Future Studies .....	73
6.5 Conclusions.....	74
 REFERENCES .....	 76
 APPENDICES .....	 102
Appendix A - IRB Approval to Conduct Research .....	102

Appendix B - G*Power for Sample Size Calculation.....	103
Appendix C - Consent and Survey Scales .....	104
Appendix D - HTMT Metrics for EK as a HOC .....	114
BIOGRAPHICAL SKETCH .....	116

## LIST OF TABLES

Table	Page
1. Means, Standard Deviations and Correlations– of the Full Moderated Mediation and Constructs.....	38
2. Outer Loadings for LOCs and Other Measurement Models.....	43
3. Reliability and Validity Statistics for LOCs and other Measurement Models.....	46
4. Discriminant Validity (Fornell-Laker Criterion) for LOCs and other Constructs.....	48
5. Results of HTMT Discriminant Validity Assessment for LOCs and other Constructs.....	49
6. Higher-Order Construct Reliability and Validity for EK.....	51
7. Higher-Order Construct Reliability and Validity for FP.....	51
8. Higher-Order Constructs’ (EK and FP) Reliability and Validity Metrics.....	54
9. Fornell-Larcker Criterion for the HOCs (EK and FP) .....	54
10. HTMT Criterion Ratios for the HOCs (EK and FP) .....	55
11. Collinearity Statistics (VIF) – Inner VIF Values.....	57
12. Direct and Indirect Mediation Results.....	58
13. Moderation Effects on Tech and non-Tech (Traditional) Firms.....	59

14. R Square.....	62
15. The $f^2$ effect size.....	63
16. $Q^2$ effects.....	64
Appendix Table	
17. HTMT Metrics for EK as a HOC.....	114

## LIST OF FIGURES

Figure	Page
1. Impact of the DCs – opportunities lens on SMEs Performance.....	9
2. Path Model Showing all Measurement Models.....	41
3. HOCs measurement models with LOCs as Indicators.....	53
4. Structural Model Results.....	56
Appendix Figure	
B - G*Power for Sample Size Calculation.....	103

## LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
CK	Customer Knowledge
CCA	Confirmatory Composite Analysis
CR	Composite Reliability
CUSSAT	Customer Satisfaction
DC	Dynamic Capabilities
EK	Entrepreneurial Knowledge
GCC	Gulf Cooperation Council
HOC	Higher Order Construct
HTMT	Heterotrait-Monotrait Ratios
IRB	Institutional Review Board
ITD	Information Technology Dependency
KH	Know-How
LOC	Lower order Component
LV	Latent Variable
MAE	Mean Absolute Error
MAPE	Mean Absolute Percentage Error
MK	Market Knowledge
MKTEFF	Market Effectiveness

MV	Manifest Variable
N	Total Sample Size
OE	Opportunities Exploitation
OR	Opportunities Recognition
FP	Performance
PLA-SEM	Partial Least Squares Structural Equation Modeling
RMSE	Root Mean Squared Errors
RBV	Resource-Based View
SD	Standard Deviation
SMEs	Small and Medium-sized Enterprises
USA	University of South Alabama
VIF	Variance Inflation Factor
VRIN	Valuable, Rare, Imperfectly imitable, and Non-replaceable

## ABSTRACT

Albimani, Naema M Ph.D., University of South Alabama, December 2022. The Impact of Dynamic Capabilities on Small and Medium-sized Enterprises (SMEs) Performance in Oman. Chair of Committee: Joseph Hair, Ph.D.

Drawing on dynamic capabilities' theory, this study examines the impact of entrepreneurial knowledge (EK) on firm performance in Oman, a member nation of the Gulf Cooperation Council (GCC). In addition, two aspects of dynamic capabilities: (1) opportunities recognition and (2) opportunities exploitation, were explored as potential mediators of the indirect relationship between entrepreneurial knowledge and firm performance. Using a cross-sectional survey design (N=102), the study found entrepreneurial knowledge has a direct, positive, statistically significant relationship on firm performance, as measured by customer satisfaction and market effectiveness. At the same time, the sequential mediation of opportunity recognition and opportunity exploitation was positive and significant. In contrast, the proposed mediated relationship from EK through opportunity exploitation to firm performance was not significant.

A subsequent analysis proposing business IT dependency (ITD) of SMEs in Oman (tech firms versus non-tech firms) as a moderator of the relationships between entrepreneurial knowledge and the sequential order mediation of opportunity recognition and opportunity exploitation to firm performance was not significant. The relatively small sample size of this study or other underlying factors, such as cultural factors, may have influenced the proposed mediated moderated results. Therefore, based on the literature, further investigation is needed to better understand these relationships. Overall, the

findings provide an initial understanding of potential relationships between EK and firm performance in less developed countries.

## **CHAPTER I: INTRODUCTION**

### **1.1 Research Focus, Objective, and Relevance of Research**

Small and medium-sized businesses (SMEs) are essential contributors to the Oman economy and are also crucial to any country's economic growth (Magd & McCoy, 2014; Sanyal, et al. 2020). The performance of the SME sector is closely linked, therefore, to the performance of the entire country (Pandya, 2012). In SMEs, researchers and managers are constantly looking for ways to improve performance. This is especially true when it comes to assessing the impact capabilities have on performance, as well as identifying opportunities that can be pursued by organizations and the extent to which they ultimately impact performance (Carlos & Pinho, 2011; Eikelenboom & Jong, 2019). Entrepreneurship performance in Oman was ranked 33rd globally and third among Arab countries in a report published in 2018 (Acs et al., 2018). Indeed, estimates are that 40 percent of Oman's workforce is employed by SMEs, generating 15 to 20 percent of the country's gross domestic product (GDP) (NCSI, 2018).

This dissertation draws on dynamic capabilities theory and aims to assess the performance of SMEs in Oman using an opportunity-based lens. To do so, a structural framework is proposed consisting of relevant theoretical constructs that will facilitate the investigation of their impact on SMEs' performance from an opportunity-lens perspective. The framework evaluates performance based on two components: market effectiveness and customer satisfaction.

*Opportunity-based lens:*

"Riding the wave" is occasionally a negative term used in public debates because it often implies a negative connotation and a mixture of opportunism, selfishness, and dishonest opportunity. However, riding the wave is critical for rapid and sustained success in the business world, and it requires dynamic capabilities. Teece et al. (1997) referred to dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (P. 516). Firms with strong dynamic capabilities, as well as competencies that enhance capabilities (Winter, 2003), can ride multiple waves of change in their industry by leveraging the fungible aspects of their valuable and hard-to-replicate resources (Teece, 2014). Also, many entrepreneurs, both past and present, have achieved success by mastering the art of riding the wave, taking advantage of existing opportunities, and identifying new opportunities.

In today's business world, there are numerous opportunities and challenges. But as Kirzner (1973) noted, profit opportunities often emerge when the market is not in equilibrium. As a result, these non-equilibrium opportunities are frequently the result of current trends, technological advancements, and the amount of effort put into them. Entrepreneurship, therefore, is successful when individuals act to take advantage of marketplace opportunities when they arise (Holcombe, 2003).

### *Opportunities and Dynamic capabilities:*

According to Teece et al. (1997), dynamic capabilities are defined as a firm's ability to integrate, implement, and revise both internal and external competences in response to rapidly changing environments. Previous studies have shown companies develop dynamic capabilities that can lead to superior performance based on addressing and adapting to rapidly changing environments (Vassolo & Anand, 2008; Zahra et al., 2006). In addition, the dynamic capabilities of companies are frequently credited as being responsible for superior performance. Indeed, this approach is among the most promising recent perspectives for explaining an organization's superior performance that emerges from the accelerated dynamism of the organization's environment (Mohd et al., 2013).

There are various levels of dynamic capabilities and hierarchical ordering (Fainshmidt et al., 2016). Fainshmidt et al. (2016) proposed and empirically tested a conceptual distinction between higher-order and lower-order dynamic capabilities, arguing that the former leads to better performance both directly and indirectly through the latter. For example, according to Sanchez and Heene (2010), ambidexterity, a higher-order dynamic capability, governs the first-order dynamic capabilities of the exploration and exploitation of opportunities. The dynamic capabilities' view emphasizes the unique nature of dynamic capabilities. Dynamic capabilities, according to Teece et al. (1997) and Teece (2007), are high-order capabilities that are supported by organizational routines and managerial skills. Hence, opportunities recognition (exploration) and exploitation in this study refer to the first level (lower-order) dynamic capabilities.

Recent studies reveal the importance of a firm's resources, such as knowledge and technology, that lead to opportunities (Chandra et al., 2009; Siegel & Renko, 2012) and,

thus, improve performance (Sambasivan et al., 2009). Drawing on the theory of dynamic capabilities, this study proposes to investigate the impact of entrepreneurial knowledge (EK), opportunities recognition (OR), opportunities exploitation (OE) on the performance of small and medium-sized enterprises in Oman.

The study attempts to answer questions such as: How entrepreneurial knowledge affects opportunity types in technology and non-technology firms? How entrepreneurial knowledge affects a firm's performance? How the type of opportunity affects company performance, particularly as it mediates the relationship between entrepreneurial knowledge and firm performance?

This research employs a quantitative approach using data from an online survey to explore the concepts of entrepreneurial knowledge, opportunity recognition, and exploitation in SMEs in Oman, and their effect on firm performance, as measured by customer satisfaction and market effectiveness. The study first explains the effects of entrepreneurial knowledge, opportunity recognition, and opportunity exploitation as primary concepts influencing firm performance. The framework also examines the role of different business types with varying degrees of reliance on information technology (IT) (e.g., tech firms vs. non-tech firms) in leveraging opportunity identification and exploitation. The study will contribute, therefore, to the current body of knowledge by incorporating the most current research context, including applying strategic management concepts through the dynamic capabilities approach to the country of Oman and contributing to debates on the impact of dynamic capabilities.

The findings of this research will facilitate an improved understanding of whether relationships confirmed in Western economies also can be applied in a Middle Eastern

economic situation. It examines company performance in a new context, Oman, a developing country in the Middle East (Ashrafi & Murtaza, 2008). In addition, a methodological contribution of the study is, for the first time, an emerging, complex analytical modeling method, Partial Least Squares Structural Equation Modeling (PLS-SEM), which will be applied in a Middle Eastern context to shed light on potential opportunities to improve economic development in that region.

It is anticipated the findings of this study will contribute to both existing theory and business practices. For instance, developed and developing countries rely heavily on small and medium-sized businesses (SMEs) (Yu, 2001); however, most previous research in this area has focused on Western, developed market firms. Hence, there is minimal understanding of opportunity recognition and opportunity exploitation as they relate to firm performance in developing countries like Oman. The previous narrow focus on testing these relationships in Western, developed nations hinders theoretical development and leaves a significant gap in the literature because SMEs' growth and performance are influenced by a wide variety of country-specific factors such as culture, technological and innovation development, government support and regulations, financial capital, firms' characteristics, and the economic strategy of the country (Humphrey, 2003; Ndiaye et al., 2018). The primary purpose of this research, therefore, is to explore Oman as a testing ground to examine dynamic capabilities theory in the context of a developing country and a member of the Gulf Cooperation Council (GCC) to determine whether these approaches are applicable in a new context.

Oman is a country with much potential for attracting SMEs, but it is currently under-exploited. In Oman, SMEs are classified into micro, small, and medium businesses

(Elshaiekh et al., 2018; Riyada, 2015; *Times of Oman*, 2021). SMEs are driving 90% of Oman's economic growth, enhancing social well-being by boosting GDP, and providing useful goods and services for consumers (Saqib et al., 2018). But due to a high unemployment rate and a large young population, the Omani economy desperately needs to create new job opportunities and extend its markets, which the SME sector could likely provide. SMEs are critical for achieving economic growth, foreign exchange earnings diversification, and creating job opportunities (Eniola, 2014).

Many studies have been conducted to identify business development opportunities in Western countries. Moreover, very little research has been conducted on dynamic capabilities, entrepreneurship, and identifying business development opportunities other than in Western countries (Anand et al., 2021). No published studies explore the combination of multiple approaches to stimulating economic growth in the Middle East. A primary goal of this research, therefore, is to explore whether a combination of entrepreneurial knowledge, opportunity recognition, and opportunity exploitation can effectively stimulate and sustain economic development in Oman.

In the context of Oman, transformation to digital technology is a critical component of Oman's Vision 2040 since it is fueling economic competition and environmental sustainability (Banda, 2021). With this Vision, Oman hopes to overcome its challenges, keep up with regional changes, and generate opportunities to improve its economic competitiveness in the region and around the world (Banda, 2021). SMEs must use technology to adapt to these changes and often change their strategies to keep up with the government's new vision. For example, SMEs are required to accept electronic payments in lieu of cash and to pay employees electronically. SMEs in Oman face various

obstacles, however, such as limited business and market knowledge, little entrepreneurial experience, and a reluctance to utilize modern technology (Ramachandran & AL Yahmadi, 2019). These factors, as well as others, such as business regulations, competition, and a lack of financial resources, will limit the ability of SMEs to grow (Alqassabi, 2020). The current study hopefully will suggest alternative ways to overcome these obstacles.

As developed markets become increasingly sophisticated and competitive, the search for new opportunities in developing markets is becoming increasingly appealing (Hakala, 2015). Moreover, while more attention has been paid to developed economies when conceptualizing the dynamic capabilities framework, Fainshmidt et al. (2016) note that dynamic capabilities are equally and likely more important in developing economies than in developed economies.

This research contributes to filling this gap by investigating the role of SMEs' entrepreneurial knowledge resources in recognizing and exploiting new opportunities for SMEs in Oman, such as new business models and industries, the development of new products and/or services, and the creation of new jobs, as well as how these innovative practices affect firm performance.

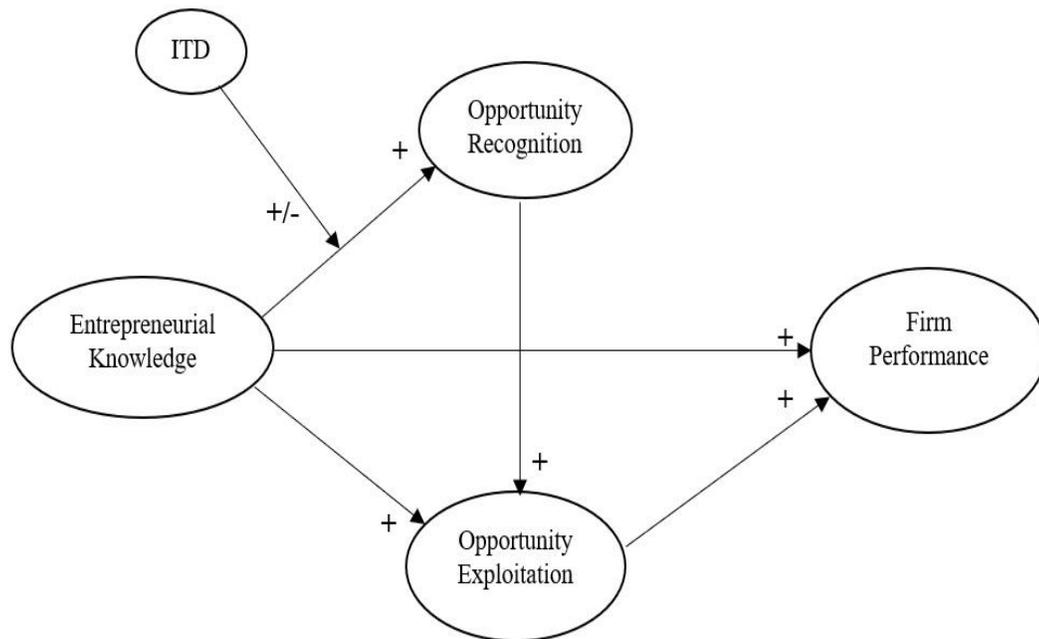
This research has implications in a variety of areas. First and foremost, this research adds to the growing body of knowledge on dynamic capabilities in a new context, Oman. Second, this research seeks to enhance our understanding of issues that are currently not fully understood, such as how SMEs in a developing country use dynamic capabilities in response to uncertain environments. Third, strategic management research is ongoing, and this study is a small component of that research focusing on a broader, more

analytical perspective and includes contextual factors which will contribute to the body of strategic management knowledge.

The research will also provide management insights into the practitioner's world on dynamic capability applications, which has received little attention in the academic literature to date. Small and medium-sized business owners should benefit from increasing awareness about the concepts, principles, and resources that influence the development of dynamic capabilities and their relationship to opportunity recognition and exploitation that lead to better performance. The findings will also provide entrepreneurs with a better understanding and more realistic guidelines for enhancing firm performance, as well as specify strategic resource management practices to facilitate identifying and exploiting opportunities.

Dealing with business development and responding to market changes increasingly involves a better understanding of a country's economic and cultural characteristics. Knowledge of selected aspects of a specific nation's culture, mindsets, and leadership is critical to generalizing the concepts described in this study. Despite previous studies, the performance of small and medium-sized enterprises (SMEs) is still poorly understood in developing countries (Katsikeas et al., 2000). Therefore, this points out the need for a blend of fundamental and applied research that will advance the field of dynamic capabilities both conceptually and practically in a new context.

A visual representation of the theoretical framework examined in this research is shown in Figure 1.



*Figure 1. Theoretical Model: Impact of Entrepreneurial Knowledge on SME Performance.*

## **1.2 Structure of the Thesis**

A general literature review of firms' entrepreneurial knowledge resources, dynamic capabilities, firm performance, and related concepts are summarized in Chapter II. From published research on dynamic capabilities, research gaps have been identified that led to the central research questions. The remaining chapters are structured as follows. Chapter III discusses the conceptual models and hypotheses development, and Chapter IV provides an overview of the research design and methodology. In Chapter V, the findings are discussed, and in Chapter VI, the limitations and future research opportunities are described. Additional empirical investigation could address these issues and potentially confirm unresolved areas for further study.

## **CHAPTER II: LITERATURE REVIEW**

A review of the theoretical framework and the relevant constructs likely to be related to SME performance are summarized in this chapter. The review focuses on opportunities and their relations to the dynamic capabilities' theory, their measurement, and Oman as a developing and emerging economy. Firm resources such as entrepreneurial knowledge, IT capability, and related operating characteristics are reviewed first, with a particular emphasis on knowledge as a unique resource. Second, the literature on dynamic capabilities, opportunities recognition, and opportunities exploitation is summarized. Then, the firm-level performance literature is reviewed. Finally, to provide a context for the study, an overview of Oman's economy and typical SMEs operating in that country is provided.

### **2.1 Firm Performance (FP)**

The term "firm performance" refers to the outcomes and extent to which a firm accomplishes its objectives. Today companies are increasingly focusing on non-financial performance such as innovation, environmental performance (Memon et al., 2020), productivity, customer satisfaction, and operational improvements (Kaplan & Norton, 1992). For example, Wang and Ellinger (2009) concluded that acquiring information and recognizing entrepreneurial opportunities positively contributes to improved individual and company performance.

Due to the dynamic environment and rapidly changing markets, small and medium business owners and managers are constantly striving to improve the performance of their

organizations by exploring new opportunities (Guo, Su, & Zhang, 2017). This dynamism and market pressure motivates SMEs to search for a sustainable survival strategy, including new opportunities that lead to higher performance. While SMEs lack the resources to exploit all opportunities they identify, studies have found mixed results regarding their success in pursuing the identified opportunities (Choi & Shepherd, 2004; Guo et al., 2017; Kamuri & Ngugi, 2019). As a result, firm performance varies depending on how successful SMEs are at recognizing and exploiting these opportunities.

Factors such as customer satisfaction and market effectiveness are critical in assessing a firm's performance (Bose & Chen, 2009). Furthermore, in a dynamic environment, companies must be customer-centric (Kotler, 1994). The term "customer satisfaction," a component of the customer-centric approach, refers to an evaluation based on cumulative purchase and consumption experiences with a product or service over the course of time (Anderson et al., 1994). According to (Kotler, 1994), improving customer satisfaction is an approach to business quality that contributes to the development of a customer-focused culture and management. In fact, customer feedback can help a business determine how to make its products and services better and change them.

The market effectiveness of a business is a key indicator of its success. According to Vicente et al. (2015), superior market effectiveness can be achieved when dynamic capabilities enable firms to upgrade operational capabilities for innovation (Teece, 2009). With these operational changes and upgrades, companies can adapt to rapid external changes and become more dynamic. Also, it is notable that firms with more marketing resources may be able to do more market research and use their knowledge more effectively to achieve better performance results (DeSarbo et al., 2005). Hence, customer

satisfaction and market effectiveness are key indicators to assess non-financial performance that ultimately leads to improved financial performance.

## **2. 2 Entrepreneurial Knowledge (EK)**

SMEs' strategy and performance are based on their entrepreneurial knowledge of the market, opportunities in that market, and appropriate behavior designed to take advantage of available opportunities (Asenge et al., 2018; Korpysa, 2020). Companies can use knowledge derived from information, beliefs, and capabilities (Vassolo & Anand, 2008). Grant (1996) asserted a company's most valuable asset is its knowledge, and knowledge resources, therefore, form barriers to protecting valuable resources in the company. Moreover, knowledge (or know-how) can be possessed by a single individual or shared among members of a team or organization (Hall & Andriani, 2002; Yang & Wan, 2004). Specific examples include understanding how to start a company, how to manage people and processes, how to grow and be competitive, how to organize activities, as well as how to stage new technology and product development (Brush et al., 2001; Wiklund & Shepherd, 2003). Knowledge also protects other valuable resources from being imitated. Thus, competitors cannot copy another company because their knowledge is subtle and difficult to understand, involving talents that are hard to discern from results (Lippman & Rumelt, 1982). Finally, because knowledge resources enable businesses to adapt to changing market conditions and competitive pressures, organizations can succeed without controlling the market or eliminating competition (Singh & Zollo, 1998).

Entrepreneurs should have a rationale in mind and use prior knowledge before hiring employees, setting up the firm's activities, purchasing equipment, forming alliances, or

attempting to sell their goods and services to the public. Prior knowledge is also essential for spotting new opportunities (Ardichvili et al., 2003; Shane & Venkataraman, 2000; Zahra et al., 2006). Before taking such actions, therefore, entrepreneurs will have developed a sense of how to gain a competitive market position when opportunities emerge.

The accumulation of knowledge resources contributes to the long-term viability of the company through the entrepreneur's unique experiences and processes. As a result, entrepreneurs often have distinct perspectives on market opportunities that will be difficult to replicate by potential competitors (West III & Noel, 2009). As businesses face constantly shifting environments, their resource positions, including their knowledge resources, must adapt in real-time to meet the demands of the situation.

There are many different types of knowledge resources. For instance, these resources are frequently manifested as specialized abilities such as technical, creative, or collaborative. Some companies have the technical and creative know-how to create and market competitive products or services. However, individual knowledge, such as education and experience, are arguably the most valuable intangible resources companies have, notably when it comes to research and development (Henard & McFadyen, 2006). In addition, tacit knowledge, such as collaborative working relationships within a firm and the social context in which it operates (Hitt et al., 2001), is critical for identifying and exploiting entrepreneurial opportunities (Barney, 1991).

Moreover, a company may possess collaborative or integrative abilities that enable experts to collaborate and learn more effectively (Fiol, 1991; Itami, 1987). Similarly, experience-based knowledge can help identify opportunities, provide market intelligence,

and facilitate networking (Mcdougall et al., 2003). Innovative entrepreneurship, therefore, can be characterized by the complexity of knowledge at the center of the process (Zander & Kogut 1995). Most new ventures struggle, however, to convert the entrepreneur's personal knowledge of the industry, market, and products into company resources (Brush et al., 2001). On the other hand, entrepreneurs who have a unique understanding of market opportunities, for example, in tech-based firms, can leverage the interface between new technology and unmet market needs because they typically have technical knowledge based on previous experiences (West III & Noel, 2009).

### **2.3 Dynamic Capabilities (DCs)**

Dynamic capabilities represent a company's ability to integrate, build, and reconfigure internal and external resources and competencies to respond to and shape rapidly shifting business environments (Teece et al., 1997). Scholars have differed in how they have identified ordinary capabilities and dynamic capabilities. For example, operational or ordinary capabilities are zero-order capabilities that are well-defined processes which enable an organization to address current challenges in their industry environment. Also, zero-order capabilities are operational capabilities that facilitate "making a living" (Winter, 2003), such as firms' operational routines in a stable environment, by optimizing existing plans, resources, and skills (Pavlou and El Sawy, 2010). In contrast, dynamic capabilities change how an organization operates in response to its uncertain environment (Helfat & Winter, 2011) and are based on planned opportunities (Pavlou & El Sawy, 2010). In addition, Collis (1994) and Zollo and Winter (2002) distinguish between first-level (lower-order) and second-level (higher-order)

dynamic capabilities, where both levels of capabilities are used to change operational routines (Easterby & Prieto, 2008). According to research by Güttel and Konlechner (2007), organizations' second-order dynamic capabilities determine the path of their development and impact high-order organizational learning, which ultimately impacts firms' performance. According to Fainshmidt et al. (2016), higher-order dynamic capabilities are more related to firm performance than lower-order. Yet, studies have shown that lower-order dynamic capabilities can have an impact on a business's performance (Sambasivan et al., 2009; Santarelli et al., 2013; Webb et al., 2011). That is because they impact the process of creating and capturing value (Dyduch et al., 2021), provide information that can be used to change operational routines (Güttel & Konlechner, 2007), and ultimately impact a firm's profits (Dyduch et al., 2021). Finally, Sfirsis and Moenaert (2008) proposed opportunity recognition and exploitation as first-order dynamic capabilities in their study of ambidexterity (a higher-order capability).

### **2.3.1 Reviewing Opportunities Literature**

*“Entrepreneurs see trends where others just see data; they connect dots when others just see dots. This ability to consistently recognize and seize opportunity does not develop overnight. It takes deliberate practice.”*

*—Dan Cohen, an entrepreneur and an educator. (Neck et al. 2020)*

A central concept in Kirzner's (1973) theory of entrepreneurship is that entrepreneurs can help restore market equilibrium by identifying and capitalizing on profit opportunities that arise when the market is imbalanced. Entrepreneurial opportunities can be divided into two types (Holcombe, 2003). One is more open to the innovative

entrepreneur because no one else can see the opportunity, such as exploring a new market or developing a new product. In contrast, the other type relies solely on seeing an unexploited market using widely available information (Holcombe, 2003).

Entrepreneurship, according to Kirzner (1973), is more in line with the second type of activity. However, Schumpeter (1934) defined an entrepreneur as someone who introduces new combinations and changes to the economy's business environment, thus creating new opportunities for the economy. Entrepreneurs, in this sense, are individuals who are creative but not inventors who make money by recognizing and seizing new opportunities (Endres & Woods, 2007; Thompson, 1999).

Opportunity recognition is defined as "perceiving a possibility for new profit potential through (a) the founding and formation of a new venture or (b) the significant improvement of an existing venture." (Hills & Singh, 2004, P. 260). Opportunity exploitation is defined as "an activity in which entrepreneurs continuously collect, integrate, and utilize available and/or new resources in order to achieve more effective methods and more satisfying results." (Ge et al., 2016, P. 502). Opportunity exploration (or recognition) and exploitation are considered first-level (lower-order) dynamic capabilities (Sfirtsis & Moenaert, 2008). Also, Shane and Venkataraman (2000) clarify how opportunity recognition and opportunity exploitation are related. They asserted that while discovering an opportunity is necessary for entrepreneurship, it is not enough, and entrepreneurs have to decide whether to take advantage of an opportunity after discovering it. According to this logic, opportunity recognition and opportunity exploitation are two distinct but often sequential steps in the entrepreneurial process (Shane & Venkataraman, 2000).

### **2.3.1.1 Opportunity Recognition (OR).**

A frequently asked question is why some people discover new opportunities while others do not. Individuals are constantly brainstorming for new and improved ways of addressing problems. Examples of new approaches could be brand-new business concepts, new products, and services to meet the demands and expectations of customers, or the creation of new jobs. A key characteristic of entrepreneurial firms is their ability to spot new market niches and capitalize on those niches by developing new products and services (Shane, 2000; Stevenson & Jarillo, 1990). In general, opportunities are identified by individuals when they realize the value of them (Shane & Venkataraman, 2000). But Hayek (1945) adds that opportunities are preceded by a belief they exist, but not everyone recognizes them.

Opportunity recognition is a process that can be observed based on how entrepreneurs and entrepreneurial businesses approach new ventures or ideas. Shane and Venkataraman (2000) defined opportunity recognition as the process of discovering and evaluating opportunities to create future goods and services. Similarly, Christensen and Peterson (1990) defined opportunity recognition "as perceiving the possibility for new profit through the founding and formation of a new venture or the significant improvement of an existing venture." (P. 260). Shane and Venkataraman (2000) view opportunities as existing in the market, while other researchers argue that entrepreneurs create opportunities and mold their companies to their characteristics (Gartner, 1988). In either case, the ability of individuals to discover new ventures relies on their prior knowledge and experience, understanding of the competitive context, and the courage to take action, all enabling them to identify and define new opportunities others would miss.

### **2.3.1.2 Opportunity Exploitation (OE).**

Recognizing an opportunity and exploiting it are two distinct processes, with the latter occurring due to action taken to capitalize on the opportunity (McMullen & Shepherd, 2006). Exploiting opportunities is the process of putting activities, capabilities, and initiatives in place to take advantage of opportunities that have already been established (Cha & Bae, 2010; Foss et al., 2013). Thus, two critical aspects of entrepreneurship are opportunity recognition and opportunity exploitation (Barney et al., 2018).

Several factors motivate entrepreneurs to exploit opportunities. For instance, the exploitation of opportunities is related to supply and demand in the market. Studies have demonstrated that entrepreneurs take advantage of opportunities most in demand in the market (Schmookler, 1966). Additionally, exploitation frequently occurs when the intensity of competition in a given opportunity space is neither quite low nor high (Hannan & Freeman, 1984). Some other factors are related to the abundance of financial capital (Evans & Leighton, 1991), substantial knowledge resources (Carroll & Mosakowski, 1987; Cooper et al., 1988), strong social ties to external stakeholders that facilitate resource acquisition and opportunity exploitation (Aldrich & Zimmer, 1986), and entrepreneurs' perceptions and individual differences (Chen et al., 1998; Cooper et al., 1988).

## **2.4 SMEs in Oman**

Strategic and organizational theory indicates a firm's performance is related to the evolutionary and dynamic nature of the organization's fit to its environment (Romanelli

& Tushman, 1994). The ability of an organization to respond to external pressures, however, is not always automatic or effective. For example, some scholars debate whether decision-makers can have a meaningful impact on this alignment through strategic decisions and actions (Child, 1972) or whether resource constraints (Hannan & Freeman, 1977) and institutional norms (Zuckler, 1983) substantially restrict potential responses. Finally, the firm's domestic market environment is assumed to include all external market forces and conditions that affect and are affected by the firm's actions but are not controlled by the firm's organizational boundaries (Yeoh, 1994). As an example, the stock market fluctuates in an unpredictable manner all over the world. When it rises a few points, it sometimes quickly falls back, and other times the level is sustained for a much longer time period. Therefore, investors and business owners may become alarmed if the stock market goes up or down sharply. Undoubtedly, oil prices and changes in the global economy affect the local markets in Oman (Al Balushi, 2017). For example, global economic conditions, high oil prices, and soaring inflation could affect Oman's market (Vidal and Vidal, 2021). Hence, entrepreneurs and business owners are confronted with market fluctuations beyond their control. Entrepreneurs must be vigilant, therefore, in assessing environmental conditions and determining whether an existing fit with the firm is desirable or whether some form of strategic intervention is required. Therefore, entrepreneurs in Oman are anticipated to effectively use their entrepreneurial knowledge to identify and exploit opportunities, which will ultimately impact the firm's performance.

## **CHAPTER III: THEORETICAL MODEL AND HYPOTHESES**

In this chapter, the proposed theoretical model and hypotheses are described. The theoretical model displayed in Figure 1 focuses on the direct relationships between entrepreneurial knowledge and firm performance, entrepreneurial knowledge and opportunity recognition, and entrepreneurial knowledge and opportunity exploitation. The model also includes indirect relationships that include two different mediating relationships (between entrepreneurial knowledge and firm performance): the sequential mediator of opportunity recognition and opportunity exploitation and the mediator of opportunity exploitation. Finally, post hoc moderated relationships based on technology embeddedness are also examined.

### **3.1 Resource-Based View (RBV)**

The resource-based view (RBV) proposes that companies are heterogeneous because they have a wide range of resources, which enables them to employ different strategies (Lavie, 2008). According to RBV, a competitive advantage is gained by focusing on an organization's internal resources rather than external ones (Barney, 1991). Hence, for resources to have the potential to serve as sources of sustainable competitive advantage, Barney (1991) asserted they must also be valuable, rare, imperfectly imitable, and non-replaceable (VRIN). Therefore, managers and entrepreneurs apply RBV criteria to identify assets, capabilities, and competencies having the potential to give the company a competitive advantage and lead to superior performance. Thus, according to RBV, a

firm can identify strategic resources it can exploit to achieve long-term competitive advantage (Barney, 1991). Moreover, businesses must develop core competencies tailored to their industry to differentiate themselves from the competition (Prahalad & Hamel, 1990). In summary, superior performance can be achieved by acquiring and utilizing a firm's unique resources, such as entrepreneurial knowledge and technological assets, compared to other firms in the same market (Dhanaraj & Beamish, 2003). This study focuses on entrepreneurial knowledge as a firm resource that enhances performance.

### **3.1.1 Direct Relationships**

#### **3.1.1.1 Entrepreneurial Knowledge and Opportunities.**

Based on the theory of planned behavior, Miralles et al. (2016) proposed entrepreneurial knowledge (EK) as a set of learning outcomes that affect entrepreneurial intentions to identify potential entrepreneurial opportunities and take action (Shane, 2000). However, others believe knowledge may negatively affect opportunities (Kautonen et al., 2011). Entrepreneurial knowledge has been defined as knowledge about starting and leading a business that reduces the uncertainty of creating a new business (Werber, 2012). EK is also viewed as the ability to recognize or create new opportunities, ultimately taking actions to apply innovative knowledge and practices that facilitate company success (Lisboa et al., 2013). At the same time, EK also shapes one's beliefs, attitudes, and perceptions about whether one can start or lead a business (Werber, 2012). This knowledge substantially impacts entrepreneurial attitudes and perceptions (Farani et al., 2017). Moreover, knowledge and ability to read opportunities play an essential role in

making decisions about starting or operating a business (Suroso et al., 2020) and ultimately affect firm performance.

Researchers have found that entrepreneurs, as information processors, have the potential to discover opportunities through a combination of a systematic search and accidental discovery (Vaghely & Julien, 2010; Fatima et al., 2011). Anis and Mohamed (2012) investigated the impact of education and prior experience on entrepreneurial knowledge. They reported that knowledge based on education and experience influences the ability of entrepreneurs to identify opportunities. Furthermore, the successful exploitation of opportunities also benefits from possessing entrepreneurial knowledge because EK gives entrepreneurs familiarity with the market. Also, knowledgeable entrepreneurs are more likely to seize opportunities because they have a better understanding of the market for their new product, access to the appropriate technologies, the ability to effectively manage their business, and the backing of key stakeholders (Choi and Shepherd, 2003). This effect (EK→OE) is likely greater in strong environmental situations, in which opportunities are readily apparent, and knowledge execution is a priority. Further, companies that attempt to exploit opportunities based on new market knowledge are less likely to experience rapid growth than those that attempt to exploit opportunities based on existing market knowledge (Saemundsson & Dahlstrand, 2005). However, Mueller (2007) suggested that since companies do not fully exploit new knowledge, entrepreneurial opportunities may arise. Thus, entrepreneurial knowledge leads to opportunity recognition in these situations

Therefore, from previous studies, both theoretical and empirical, this study proposes that an entrepreneur's ability to identify and exploit opportunities increases in proportion

to their degree of entrepreneurial knowledge that is driven by experiences, capabilities, customer knowledge, and market knowledge. Therefore, entrepreneurs who understand the role of EK are able to update their beliefs about their entrepreneurial cognitive abilities, which provides them with more knowledge over time about how to start a business, understand potential difficulties, and respond (Entrialgo & Iglesias, 2016). These types of knowledge are essential traits for developing dynamic capabilities because they include sensing, seizing, and transforming opportunities (Teece, 2012).

Though most empirical studies have been conducted in Western economies (e.g., Benitez et al., 2018; Shane, 2000), there is quite limited evidence to support these potential relationships in economies in the Middle East. For example, Benitez et al. (2018) found that knowledge about information technology (IT) performs a key role in firms' opportunity exploration and exploitation. Hence, it is important to test the applicability of these relationships since the economic context shapes the value of dynamic capabilities (Fainshmidt et al., 2016). To better understand how different individuals in different contexts view opportunities and exploitation, it would be beneficial to examine how their knowledge differs (Shane, 2000), including their experience, abilities, and knowledge of customers and markets. This study assumes entrepreneurial knowledge is expected to positively affect opportunity recognition and exploitation in SMEs in Oman. The following hypotheses are proposed:

***H1: Entrepreneurial knowledge (EK) is positively associated with opportunities recognition (OR) by SMEs in Oman.***

***H2: Entrepreneurial knowledge (EK) is positively associated with opportunities exploitation (OE) by SMEs in Oman.***

### **3.1.1.2 Entrepreneurial Knowledge and Performance.**

According to RBV, a firm's performance is facilitated by an entrepreneur's ability to acquire and apply relevant, unique knowledge, skills, and abilities (Barney, 1991) because a firm's performance depends on the entrepreneur's knowledge as a valuable and strategic resource of a firm. Entrepreneurial knowledge and performance have been examined in many studies (e.g., Al Mamun et al., 2019; Sebikari, 2019; Zhang et al., 2016). For example, Al Mamun et al. (2019) discovered entrepreneurial knowledge, including competencies, skills, and networking, all contribute to enterprise performance. Research on small business entrepreneurship has also shown an individual's demographic, psychological and behavioral traits, and technical expertise is all associated with company performance (Gerli et al., 2011; Mitchelmore & Rowley, 2010). These traits and activities related to entrepreneurial knowledge are very important for economic growth, help firms develop (Al-Mamun et al., 2016), and improve an individual's ability to run a business well (Man et al., 2002), which ultimately leads to better firm performance. Also, entrepreneurs and their start-up enterprises improve firm performance through entrepreneurial learning and experiences that enhance EK (Tseng, 2013). As a result, EK is a key component and strategic asset in boosting SME performance. While this connection has been confirmed in Western economies (e.g., Gerli et al., 2011; Man et al., 2002; Mitchelmore & Rowley, 2010; Tseng, 2013), very few studies have explored the impact of EK in Middle Eastern economies, which differ greatly in many ways such as culture, demographics, and government rules and regulations, to name a few. Therefore, based on previous literature, it is expected that entrepreneurial knowledge will positively impact SMEs' performance in Oman. Thus, this study proposes:

*H3: Entrepreneurial knowledge is positively associated with SME performance in Oman.*

### **3.2 Indirect Relationships (Mediating effects)**

This section focuses on the two types of mediating relationships: 1) the sequential mediator of opportunity recognition and opportunity exploitation, and 2) opportunity exploitation mediating the relationship between EK and firm performance.

Based on the theory of planned behavior, Miralles et al. (2016) proposed entrepreneurial knowledge (EK) is a set of learning outcomes that affect entrepreneurial intentions to both identify potential entrepreneurial opportunities and take actions (Shane, 2000). In their research, Thieme and Song (2002) confirmed a positive, sequential relationship between opportunity recognition and opportunity exploitation in achieving improved firm performance. EK positively influences opportunity recognition, prioritization, and exploitation (Shane, 2000). Recognition and pursuit of opportunities enable small and medium-sized enterprises (SMEs) to compete more effectively in the market and earn more money than their rivals (Dencker & Gruber, 2015).

While opportunities recognition and opportunities exploitation have been found to mediate the relationship between entrepreneurial knowledge and firm performance (Wei et al., 2019; Zacher et al., 2010), these relationships have not been examined in the context of SMEs in Oman. Thus, the following hypothesis is proposed:

*H4: Opportunities recognition and exploitation mediate the relationship between entrepreneurial knowledge and firm performance in SMEs in Oman.*

Recognition and exploitation of opportunities are crucial for the development and success of SMEs. However, several studies have yielded conflicting results (Peng et al.,

2009; Zhou et al., 2021), indicating opportunities may not always lead to higher performance (Guo et al., 2015), and exploiting opportunities is costly (Alvarez & Barney, 2014; Mostafa & Klepper, 2013). Some research suggests that opportunity exploitation (OE) is more important in certain situations. For example, Choi and Shepherd (2004) found small businesses with rich technological environments and support were more likely to take advantage of potential opportunities using their available resources. Hence, exploiting opportunities through available resources may lead to better performance, which is supported by the RBV concept (Barney, 1991). To test how SMEs in Oman exploit their available resources that may lead to higher performance, the following hypothesis is proposed:

***H5:** Opportunities exploitation mediates the relationship between entrepreneurial knowledge and firm performance in SMEs in Oman.*

### **3.3 Moderated Relationships**

Companies respond to opportunities in a variety of ways, each of which is expected to differ depending on the type of business and industry and the degree of using information technology in business. Yet, the literature's findings on whether tech or non-tech SME in terms of better recognizing and capitalizing on opportunities are inconsistent. For instance, according to the Organization for Economic Cooperation and Development (OECD), between 30 and 60 percent of SMEs can be classified as innovative, with only about 10 percent being technology-based. As a result, non-tech SMEs appear to be better able to respond to new opportunities than their counterparts since they are more market-oriented (OECD, 2021).

On the other hand, the context in which an SME operates, in terms of a business relying on information technology, is likely to influence performance. For example, Kearnsa and Lederer (2004) found context positively and substantially impacted businesses' reliance on IT as well as their pursuit of competitive advantage in a variety of business industries. A similar study found that tech-firms are more likely to identify and exploit opportunities because they have access to more accurate information, technology, and support from stakeholders (Choi & Shepherd, 2004). Other scholars argue that tech companies are better able to identify and exploit opportunities because they rely heavily on networks to access opportunities, gather resources, and gain legitimacy for their businesses (Birley, 1985; Dubini & Aldrich, 1991). In these contexts, it appears likely technology companies have a greater propensity to recognize and capitalize on opportunities because the applications of technology enhance both their capabilities and their knowledge of how to investigate and employ strategic resources.

Based on these contrasting findings, the study makes the following proposals for further research into the effect of business industry and IT dependence on the ability to recognize and exploit opportunities in the context of this study.

***H6-a:*** *The strength of the relationship between entrepreneurial knowledge (EK) and the sequential relationship of opportunities recognition (OR) and exploitation (OE) is higher (larger beta coefficient) among Omani Tech companies.*

***H6-b:*** *The strength of the relationship between entrepreneurial knowledge (EK) and the sequential relationship of opportunities recognition (OR) and*

*exploitation (OE) is lower (smaller beta coefficient) among Omani non-tech companies.*

## CHAPTER IV: METHODOLOGY

In this chapter, the research design and methodology used in this dissertation are explained. More specifically, the design of the study, sampling, data collection methods, and measurement scales are described in the chapter.

### **4.1 Study Sample, Location, and Research Design**

Entrepreneurial involvement in a small business context is investigated in this research. A survey research design is used to collect data and test the proposed relationships in the theoretical model. Entrepreneurs and managers of small businesses in the developing country of Oman are the target population of the research. A quantitative methodology is applied to analyze and test the hypotheses based on the data collected through an online questionnaire.

The Public Authority for Small and Medium Enterprises in Oman, also known as Riyada, classifies SMEs into three categories: micro, small, and medium, based on the number of employees and annual sales, according to the Oman News Agency (Times of Oman, 2021). A micro business is one that employs no more than five people and generates less than 100,000 Omani Rial (OR) in revenue per year. Small businesses are those with six to 25 employees and annual revenues ranging from 100,000 to \$500,000 OR or less. Medium-sized firms employ 26-99 people and generate 500,000-1,000,000 OR (Alyahyaei et al., 2020; Riyada, 2015).

## **4.2 Data Sources and Collection Procedure**

A list of SMEs was compiled from businesses registered and licensed by Oman's Ministry of Commerce and the Authority for Small and Medium-Sized Enterprise Development (Riyada), and a sample was randomly selected. In addition, statistical information for SMEs in Oman was obtained from the country's National Center for Statistical Information (NCSI), and a list was compiled from online business directories, such as the Oman Business Directory, Oman Made Directory, and Business Directory Oman. An additional random sample of firms was selected from this second list. The two lists were cleaned by eliminating duplicates and non-qualifying SMEs.

The total number of SMEs as of the end of January 2021 was 49,337 across all Governorates (National Centre for Statistics and Information, NCSI). While larger sample sizes are needed for statistical inferences, to achieve a significance level of 5% and a power of 95% for data analysis, a minimum sample size of 47 is sufficient (Hair et al., 2020).

A total of 1,000 SME' owners/managers were invited to participate between March 2022 and May 2022, with a response rate of 10.2 percent, resulting in a sample size of N=102. The IRB approved the data collection instruments and process. Data was collected from SMEs representing a variety of Omani industries. Small business owners, entrepreneurs, and/or managers were asked to respond using a structured questionnaire and an online self-completion approach with the Qualtrics platform. The data was cleaned by removing straight-lined responses, outliers, and missing data.

### **4.3 Translations, Pre-test, and Pilot Study Procedure**

The initial questionnaire was translated from English to Arabic using back-translation techniques to ensure its accuracy and clarity after transformation. Back translation is a three-step quality control procedure for translations for cross-cultural research (Shigenobu, 2007). The first step is to prepare a completed translation to its original language. Second, the newly translated text is compared to the original. Third, any discrepancies are resolved between the two. Two Arabic-speaking people working in translation jobs (from English to Arabic and from Arabic to English) were retained to translate the questionnaire for the first and second steps. Then, a translation company was hired for the final step, which involved comparing both translations using their translation standards.

Pre-testing of the questionnaire was conducted using in-depth interviews with industry experts, followed by a debriefing. Using this feedback, the questionnaire was refined to ensure understanding and a logical sequence of topics. A draft questionnaire was sent in both languages to a group of eight participants to test its clarity. Four participants were asked to answer in English, and the other group was asked to answer the Arabic version of the questionnaire. Pre-testing is important to identify any issues with the questionnaire before sending it to the participants (Hair et al., 2019).

The pilot study was used to obtain an initial assessment of the measurement quality of the survey questionnaire and to calculate the final sample size needed (Hair et al., 2017). Thirty SME owners and managers in Oman were surveyed in a pilot study. After analyzing the pilot sample, some items were modified for clarification and to fit the

sample population. The pilot study data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM).

#### **4.4 Measures**

*Entrepreneurial knowledge (EK):* A 14-item scale was used to measure entrepreneurial knowledge, which included three different dimensions: know-how (KH), customer knowledge (CK), and market knowledge (MK). The know-how (KH) scale is 4-items and adapted from Miralles et al. (2016), which measures entrepreneurial knowledge based on prior experience and education to test how related activities are converted into valuable entrepreneurial knowledge. Also, this scale was modified from an individual level measure of knowledge to the firm level. For example, the item *EK1 “Thanks to my experience, I know how to start a viable business”* converted to *“Thanks to our experience, we know how to start a viable business.”* Participants’ responses were measured on a Likert scale ranging from 0 (strongly disagree) to 10 (strongly agree). The Cronbach’s alpha for EK is .88.

In addition, items for measuring the customer knowledge and market knowledge dimensions were adapted from Deshpande et al. (1993) and Kropp et al. (2006). The concepts of customer knowledge and market knowledge are embedded in related concepts such as orientation. For example, For example, Li and Calantone(1998) tested MK by focusing on market orientation. Also, according to Narver and Slater (1991), CK is represented by a customer orientation that encompasses all activities related to gathering information about customers. Deshpandé et al. (1993) considered customer

orientation and market orientation synonymous. The Cronbach Alpha of customer knowledge is .89, and for market knowledge is .81.

According to marketing research, market and customer knowledge reflect the market and customer orientation (Atuahene-Gima 2005; Atuahene-Gima et al., 2005; De Luca & Atuahene-Gima, 2007; Jaworski & Kohli 1993). Therefore, both market and customer orientation can be used to assess market and customer knowledge. For this research, the orientation items were modified to measure market and customer knowledge. Sample scale items are *CK1* “*We ask customers what they think about our service*” and *MK3* “*Our product and service plans are based on good market.*”. Responses are collected on a Likert scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree).

*Firm Performance (FP)*: This is an 8-item scale measuring small businesses performance that includes two components—customer satisfaction and market effectiveness. The items are adapted from Vorhies and Morgan (2005) and Engelen et al. (2014). The Cronbach’s alpha of firm performance is .73. Responses are measured on a Likert scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree). Sample items include *CUSSAT1* “*Overall customer satisfaction*” and *MKTEFF1* “*Market share growth.*” The customer satisfaction scale reliability is .94, and the market effectiveness scale reliability is .93.

*Opportunities recognition (OR)*: A 5-item scale measuring OR is adapted from Kuckertz et al. (2017) and has a Cronbach’s alpha of .90. A sample item of this scale is *OR1* “*We always alert to business opportunities.*”. Responses are measured on a Likert scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree).

*Opportunities exploitation (OE):* A 6-item scale measuring OE is adapted from Kuckertz et al. (2017) and has a Cronbach's alpha of .70. A sample item of this scale is OE2 "Based on a business opportunity we identified; we have developed a new product.". Responses are measured on a Likert scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree).

*Business's dependence on IT (ITD):* A 5-item measure distinguished tech firms from non-tech firms and was adapted from Kearnsa and Lederer (2004). The Cronbach's alpha was .89. Participants were asked to rate the extent to which the business is dependence on IT. A sample item is ITD4, "the daily operations of the business are critically dependent on information systems.". Responses are measured on a Likert scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree).

*Control Variables:* New and established firms were control variables, and items used to measure them are based on the firms' age and size. Firm age was measured using six categories of operational periods (Osunsan et al., 2015). Firm size was categorized based on The Public Authority for Small and Medium Enterprises in Oman (Riyada), with SMEs divided into three groups based on the number of employees: micro, small, and medium. A micro business is one that employs no more than five people. Small businesses are those with six to 25 employees. Medium-sized firms employ 26-99 employees (Alyahyaei et al., 2020; Riyada, 2015). For measuring firms' age, we asked participants, "Please indicate how long (years) your firm has been engaged in business operations?". For measuring firm size, we asked participants, "Please indicate how many full-time employees does your company have?". Using control variables enables researchers to determine the influence of these variables in the analytical solution. They

are also known as 'external variables' and may influence the study's internal validity (Christensen et al., 2014).

The questionnaire items are evaluated using a variety of scale formats to minimize common methods variance (Podsakoff et al., 2003; 2012). The scale formats include 11-point versions to ensure an adequate amount of variance (coefficient of variation) in the data and better identify meaningful relationships (Dawes, 2002; Hair et al., 2020). The endpoints on the scale are 0= (Too little/Much worse) and 10= (Very much/Much better).

#### **4.5 Data Analysis**

Partial Least Squares Structural Equation Modeling (PLS-SEM) is used to analyze the data. PLS-SEM using the SmartPLS 3 software facilitates examining the measurement and structural model simultaneously (Ringle et al., 2015). It also enables users to test theoretical models and simultaneously examine the direct and indirect effects of entrepreneurial knowledge (EK), opportunity recognition (OR), opportunity exploitation (OE), business types (ITD), and firm performance (FP). The findings include simple descriptive statistics such as means, standard deviations, and correlations for each of the variables, as well as analytical metrics for assessing and confirming complex structural equation models.

The possibility of common method bias (CMB) threatening the validity of conclusions about the relationships between constructs has been raised by some scholars (Podsakoff et al., 2003; 2012). The questionnaire was designed based on guidelines to minimize the likelihood of CMB. To assess the presence of common methods variance in the analysis, the Harman's single factor method was applied on a post hoc basis.

Previous studies have suggested the Harman approach (Harman, 1960) may not detect the presence of CMB, but more recent research indicates it is a quite meaningful method (Babin et al., 2016; Fuller et al., 2016). The results of applying the Harman's test to the independent and dependent variables in the structural model indicated CMB is not a problem in this study.

## **CHAPTER V: RESULTS**

This chapter summarizes the statistical procedures applied to test the hypotheses. The first section discusses descriptive statistics, and the second section discusses the PLS-SEM results, including an assessment of the measurement models and an evaluation of the structural relationships.

### **5.1 Descriptive Statistics**

Descriptive statistics, including means, standard deviations, and correlations for all variables in the initial model are presented in Table 1. Multiple significant relationships between structural model constructs were found that are consistent with previous research findings. As a result of the findings, the theoretical measurement models are shown to be both reliable and valid.

*Table 1. Means, Standard Deviations, and Correlations – of the Full Theoretical Model and Constructs.*

	Variables	Mean	Std. Deviation	Correlations				
				1	2	3	4	5
1	Entrepreneurial Knowledge	6.70	1.88					
2	Opportunity Recognition	6.48	2.19	.74**				
3	Opportunity Exploitation	4.75	1.59	.58**	.66**			
4	Firm Performance	6.54	2.03	.65**	.60**	.64**		
5	ITD	4.40	2.64	.28**	.28**	.40**	.39**	

Notes: ITD- Information Technology Dependency. \*\* Correlation is significant at the 0.01 level (2-tailed).

## **5.2 PLS-SEM ANALYSIS**

The theoretical model displaying the relationships between the independent and dependent variables is shown in Figure 1. Partial Least Squares Structural Equation Modeling (PLS-SEM) is used to examine both the measurement and structural models simultaneously (Ringle et al., 2015). PLS-SEM enables users to evaluate a single theoretical model and investigate the direct, indirect, and moderating effects of the theoretical model constructs simultaneously (Hair et al., 2020). The two-step method is most appropriate and recommended for PLS-SEM analysis (Hair et al., 2019). The first step involves following the confirmatory composite analysis (CCA) procedure to evaluate and confirm the measurement models (Hair et al., 2020). The second step focuses on evaluating the structural model.

This theoretical model is based on dynamic capabilities theory (Teece et al., 1997) and explores the convergence of dynamic capabilities (DCs) and entrepreneurial opportunities. The exogenous construct is the higher order construct (HOC) of entrepreneurial knowledge (EK). The HOC includes three lower order components (LOCs) that involve testing of two layers (Hair et al., 2017; Ringle et al., 2015) and is theorized as a reflective-reflective model. Representing constructs using a higher order modeling approach increases parsimony, decreases model complexity, and reduces multicollinearity between exogenous constructs (Hair et al., 2017). Specifically, EK is represented as three first-order components specified as (1) know-how abilities, (2) customer knowledge, and (3) market knowledge.

The ultimate dependent endogenous construct is firm performance (FP) which is also modeled as a higher-order construct (HOC). The HOC is modeled as a reflective-reflective higher-order construct representing two first-order components (LOCs): customer satisfaction and market effectiveness (Sarstedt et al., 2019). Applying a reflective-reflective theoretical HOC for both EK and FP makes it possible to validate these constructs and minimize multicollinearity problems in executing the structural analysis. The second-order models proposed and confirmed in this study are based on the theory that higher-order constructs for EK and FP can more effectively represent and explain the seemingly different but related lower-order constructs.

Three direct relationships are hypothesized between EK and FP, EK and OR, and EK and OE based on dynamic capabilities theory. There are also two indirect relationships (mediated) between EK and FP. One mediated relationship is EK through the sequential order of OR and OE to FP, and the second mediated relationship is EK

through OE to FP. These two mediated relationships are considered lower-order dynamic capabilities by Fainshmidt and colleagues (2016).

The theoretical model also includes a potential moderating variable – the firm's IT dependence. IT dependence is defined as the extent to which the firm relies on technology to operate the business (high or low). The hypothesized moderated-mediation relationships (Hair et al., 2020) are a comparison of technological firms and non-technological firms for the relationships EK to the sequential order of OR to OE.

In the next sections, the data analysis and results are discussed. The process follows the two-step SEM assessment procedure (Hair et al., 2019).

### **5.2.1 The Concept of Reflective-Reflective HOCs**

In line with Becker et al. (2012), Mode A is specified, which “corresponds to correlation weights derived from bivariate correlations between each indicator and the construct” (Hair et al., 2017, p. 49) to estimate the two HOC measurement models. For this model structure, the two higher-order components EK and FP, and their lower-order components are assessed. The measurement models for the two HOCs and their lower-order LOCs are shown in Figure 2. The higher-order component *EK* is an exogenous construct in the structural model, and the higher-order FP is an endogenous construct in the model. The repeated indicators approach is used, therefore, to minimize the parameter bias in the higher-order construct measurement models (Sarstedt et al., 2019). First, we assess the measurement models of the lower-order components by applying the appropriate metrics for each LOC. Then, the metrics of the higher-order constructs and other constructs are examined. Finally, the structural model metrics are evaluated.

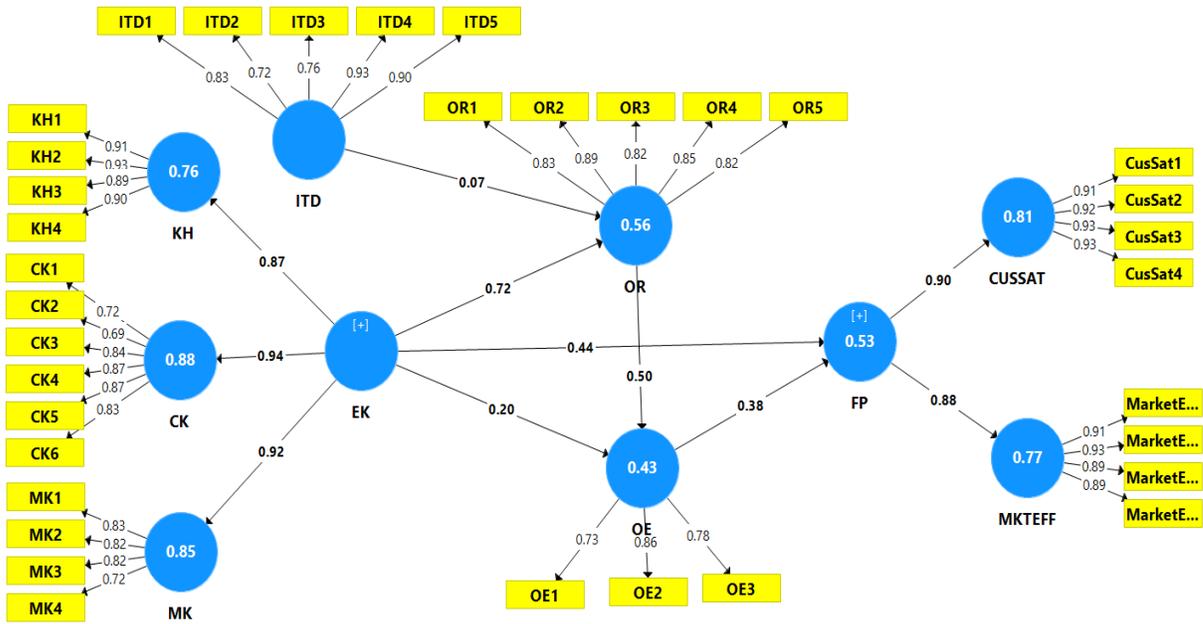


Figure 2. Path Model Showing all Measurement Models.

### 5.2.1.1 LOCs Measurement Model Assessment

The lower-order components of the two HOC measurement models require applying standard model evaluation criteria for PLS-SEM. These metrics include factor loadings, item reliability, construct reliability, convergent validity (AVE), and discriminant validity (HTMT).

Table 2 shows the results of the outer loadings for the complete theoretical model constructs, including the associated individual indicators for the LOCs. The loadings of the higher-order construct *EK* are represented by the loadings of its lower-order

components *KH*, *CK*, and *MK*, and the loadings of the higher-order construct *FP* are represented by the loadings of the lower-order components *CUSSAT* and *MKTEFF*, as recommended by Sarstedt et al. (2019). The outer loadings minimum criterion of .708 or above was not met by several items in the initial measurement model assessment (Hair et al., 2017). Most items had loadings above the minimum and were retained. Bagozzi et al. (1991) and Hair et al. (2019) recommend removing any indicators with loadings lower than .40. The items removed due to quite low loadings were mostly on the opportunities exploitation (OE) construct. These items were OE4 (*We have asked family and friends to provide financial support for our business*), which was .21, OE5 (*We have asked government support programs to provide financial support for our business*), which was .10, and OE6 (*We have asked banks and/or incubators to provide financial support for our business*) which was -.36. Several items slightly below the minimum of .708 on other constructs were retained, such as CK2 (.690), because they were close to meeting the recommended criteria (Hair et al., 2020). In addition, these items are retained because they are theoretically aligned and contribute to content validity (Hair et al., 2020; Hair et al., 2017). Three more items were retained for the OE construct as they met the recommended criteria. They are OE1 (*We have set up our organization to pursue a business opportunity we identified*), OE2 (*Based on a business opportunity we identified; we have developed a new product*), and OE3 (*We have put together an entrepreneurial team to pursue a business opportunity we identified*). Table 2 shows the item loadings identified by the CCA process (Hair et al., 2020).

*Table 2. Outer Loadings for LOCs and Other Measurement Models.*

	CK	CUSSAT	ITD	KH	MK	MKTEFF	OE	OR
CK1	0.72							
CK2	0.69							
CK3	0.84							
CK4	0.87							
CK5	0.87							
CK6	0.83							
CusSat1		0.91						
CusSat2		0.92						
CusSat3		0.93						
CusSat4		0.93						
ITD1			0.83					
ITD2			0.72					
ITD3			0.76					
ITD4			0.93					
ITD5			0.90					
KH1				0.91				
KH2				0.93				
KH3				0.89				
KH4				0.90				
MK1					0.83			

Table 2. cont.

MK2	0.82	
MK3	0.82	
MK4	0.72	
MktEff1		0.91
MktEff2		0.93
MktEff3		0.89
MktEff4		0.89
OE1		0.73
OE2		0.86
OE3		0.78
OR1		0.83
OR2		0.89
OR3		0.82
OR4		0.85
OR5		0.82

Notes: KH-Know-How; CK- Customer Knowledge; MK- Market Knowledge; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency; MKTEFF- Market Effectiveness; CUSSAT- Customer Satisfaction.

Drawing on the recommended reliability and validity criteria for reflective measurement models (Hair et al., 2017; Sarstedt et al., 2019), we first assess the lower-order components of each HOC, as well as the metrics for other constructs not modeled

as HOCs. Table 3 provides an overview of the reliability and validity results for all LOCs on both HOCs and the regular theoretical measurement models. The internal consistency reliability, including Cronbach alpha, composite reliability, and rho\_A, are displayed. Internal consistency reliability of all measurement models was greater than .70, exceeding the recommended minimums (Hair et al., 2017). The convergent validity is based on the average variance extracted from the indicators (AVE). The AVEs of all theoretical constructs exceeded the recommended levels of .50 (Hair et al., 2020). Additionally, the results in Table 3 show that measures of the *KH* LOC confirm convergent validity based on average variance extracted (AVE = 0.82) and internal consistency reliability (composite reliability = 0.95; Cronbach's Alpha = 0.93; rho\_A = 0.93). Similarly, the measures of the *CK* LOC indicate convergent validity in terms of average variance extracted (AVE = 0.65) and internal consistency reliability (composite reliability = 0.92; Cronbach's Alpha = 0.89; rho\_A = 0.90). In addition, the *MK* LOC exhibits convergent validity (AVE= 0.64), and internal consistency reliability (composite reliability = 0.88; Cronbach's Alpha = 0.81; rho\_A = 0.81). Next, the *fp* HOC measured by the *CUSSAT* LOC has convergent validity based average variance extracted (AVE = 0.85) as well as internal consistency reliability (composite reliability = 0.96; Cronbach's Alpha = 0.94; rho\_A = 0.94). Likewise, the *MKTEFF* LOC has convergent validity based on average variance extracted (AVE = 0.82) and also internal consistency reliability (composite reliability = 0.95; Cronbach's Alpha = 0.92; rho\_A = 0.93). Thus, the observed indicators in for all LOCs are consistent in their ability to measure what they were designed to measure (Hair et al., 2020).

*Table 3. Reliability and Validity Statistics for LOCs and other Measurement Models*

	Cronbach's		Composite	Average Variance
	Alpha	rho_A	Reliability	Extracted (AVE)
CK	0.89	0.90	0.92	0.65
CUSSAT	0.94	0.94	0.96	0.85
ITD	0.89	0.92	0.92	0.69
KH	0.93	0.93	0.95	0.82
MK	0.81	0.81	0.88	0.64
MKTEFF	0.92	0.93	0.95	0.82
OE	0.70	0.71	0.84	0.63
OR	0.90	0.90	0.92	0.71

Notes: KH-Know-How; CK- Customer Knowledge; MK- Market Knowledge; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency; MKTEFF- Market Effectiveness; CUSSAT- Customer Satisfaction.

The next theoretical model metric to evaluate is discriminant validity, which measures the “extent to which a construct is truly distinct from other constructs by empirical standards” (Hair et al., 2020, p. 104). Discriminant validity was evaluated using both the Fornell-Larcker (F-L) criterion (1981) and the Heterotrait-Monotrait ratios (HTMT). These results are shown in Tables 4 and 5.

The Fornell-Larcker criterion requires the square root of each construct's AVE to be greater than the highest correlation between that construct and any other construct (Hair

et al., 2017). Results indicate all constructs – including lower-order components – met the recommended criteria, thus, supporting discriminant validity based on the F-L metric.

The Heterotrait-Monotrait Ratios (HTMT) were evaluated as a more rigorous confirmation of construct discriminant validity. The results displayed in Table 5 indicate all the HTMT ratios, including lower-order components, were below the recommended range of 0.85. Also, none of the confidence intervals include the value 0 (Henseler et al., 2015; Hair et al., 2017). Moreover, the LOCs exhibited discriminant validity among each other and to all other constructs in the model. Therefore, discriminant validity was demonstrated for the theoretical model constructs and thus, we can move to assess the higher-order constructs' measurement models.

However, we do not consider the discriminant validity between lower-order components and their higher-order constructs in both Table 4 and Table 5. This guideline is appropriate for HTMT discriminant validity between these constructs since it is expected due to the repeated indicators of the higher-order component measurement model (Sarstedt et al., 2019).

*Table 4. Discriminant Validity (Fornell-Larcker Criterion) for LOCs and other Constructs.*

	CK	CUSSAT	ITD	KH	MK	MKTEFF	OE	OR
CK	0.80							
CUSSAT	0.62	0.92						
ITD	0.24	0.32	0.83					
KH	0.70	0.52	0.32	0.91				
MK	0.83	0.66	0.22	0.72	0.80			
MKTEFF	0.49	0.58	0.37	0.34	0.51	0.90		
OE	0.58	0.55	0.41	0.39	0.56	0.56	0.79	
OR	0.68	0.63	0.28	0.60	0.77	0.43	0.64	0.84

Notes: KH-Know-How; CK- Customer Knowledge; MK- Market Knowledge; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency; MKTEFF- Market Effectiveness; CUSSAT- Customer Satisfaction.

*Table 5. HTMT Discriminant Validity Ratios for LOCs and other Constructs.*

	CK	CUSSAT	EK	ITD	KH	MK	MKTEFF	OE	OR
CK									
CUSSAT	0.68								
EK	NA	0.70							
ITD	0.28	0.34	0.31						
KH	0.77	0.56	NA	0.35					
MK	NA	0.76	NA	0.27	0.83				
MKTEFF	0.54	0.61	0.52	0.40	0.37	0.59			
OE	0.74	0.68	0.69	0.51	0.48	0.74	0.70		
OR	0.76	0.68	0.80	0.30	0.65	NA	0.46	0.81	
FP	0.69	NA	0.70	NA	0.53	NA	NA	NA	NA

Notes: KH-Know-How; CK- Customer Knowledge; MK- Market Knowledge; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency; MKTEFF- Market Effectiveness; CUSSAT- Customer Satisfaction; FP-Firm Performance; EK-Entrepreneurial Knowledge. NA = not applicable to these construct comparisons (Hair et al., 2020).

### **5.2.1.2 HOCs Measurement Model Assessment.**

The relationship between each of the higher-order constructs, EK and FP, and their lower-order components are also included in the assessment of the higher-order construct's reliability and validity. The KH, CK, and MK constructs are specifically interpreted as indicators of the EK HOC, and CUSSAT and MKTEFF are interpreted as indicators of the FP HOC. This means while they appear in the path model as path coefficients, the reflective relationships between the EK and its lower-order components KH, CK, and MK, and between the FP and its lower-order components CUSSAT and MKTEFF are interpreted as loadings (Sarstedt et al., 2019).

Loadings for the LOCs KH (0.87), CK (0.94), MK (0.92), CUSSAT (0.90) and MKTEFF (0.88) indicate these indicators exhibit item reliability. In addition, the relevant statistics to evaluate each higher-order construct reliability and validity are calculated using the related indicator loadings and the correlations between the constructs. For this study, the Excel spreadsheet available from pls-sem.com (Hair et al., 2020) is used to compute reliability and validity using the equation below:

$$p_c = \frac{(\sum_{i=1}^M l_i)^2}{(\sum_{i=1}^M l_i)^2 + \sum_{i=1}^M \text{var}(e_i)}$$

Where  $e_i$  is the measurement error of the lower-order component I, and  $\text{var}(e_i)$  denotes the variance of the measurement error, which is defined as  $1 - l_i^2$

The Cronbach's Alpha was calculated using the formula below:

$$\text{Cronbach's } \alpha = \frac{M \cdot \bar{r}}{(1 + (M - 1) \cdot \bar{r})}$$

Where  $r$  represents the average correlation between the lower-order components, and  $M$  is the number of lower-order components.

The AVE was calculated using the following formula:

$$AVE = \frac{(\sum_{i=1}^M l_i^2)}{M}$$

Where  $l_i$  represents the loading of the lower-order component,  $i$  of a specific higher-order construct measured with  $M$  lower-order components ( $i = 1, \dots, M$ ).

Tables 6 and 7 display the reliability and validity metrics for the two HOCs. Results indicate the reliability and validity metrics for the higher-order constructs EK and FP are above the recommended threshold of 0.708 (Hair et al., 2017). In addition, the convergent validity AVEs exceeded the recommended levels of .50 (Sarstedt et al., 2019).

*Table 6. Higher-Order Construct Reliability and Validity for EK.*

	Loadings
KH	0.87
CK	0.94
MK	0.92
Composite Reliability	0.94
Cronbach's Alpha	0.88
Average Variance Extracted (AVE)	0.83

Notes: KH-Know-How; CK- Customer Knowledge; MK- Market Knowledge.

*Table 7. Higher-Order Construct Reliability and Validity for FP.*

	Loadings
CUSSAT	0.90
MKTEFF	0.88
Composite Reliability	0.88
Cronbach's Alpha	0.73
Average Variance Extracted (AVE)	0.79

Notes: MKTEFF- Market Effectiveness; CUSSAT- Customer Satisfaction.

To assess the discriminant validity of the higher-order constructs, we apply the HTMT criterion (Henseler et al., 2015). Since we have three LOCs for the higher-order construct EK in this model, KH, CK, and MK, we need to identify the correlations

between the three LOCs. The calculation steps and results of HTMT for the higher-order construct EK are shown in Appendix D.

For the higher-order construct FP, the correlation between CUSSAT and MKTEFF is 0.58. Thus, we validate the higher-order construct FP by including the new latent variables produced from the lower-order components and executing the standard PLS algorithm with no changes (Sarstedt et al., 2019). The new constructs CUSSAT and MKTEFF are included as indicators of FP, as shown in Figure 3. The same process is applied to the higher-order construct EK, and the results are provided in appendix D. The values of the new constructs KH, CK, and MK are represented as indicators of EK, as shown in Figure 3.

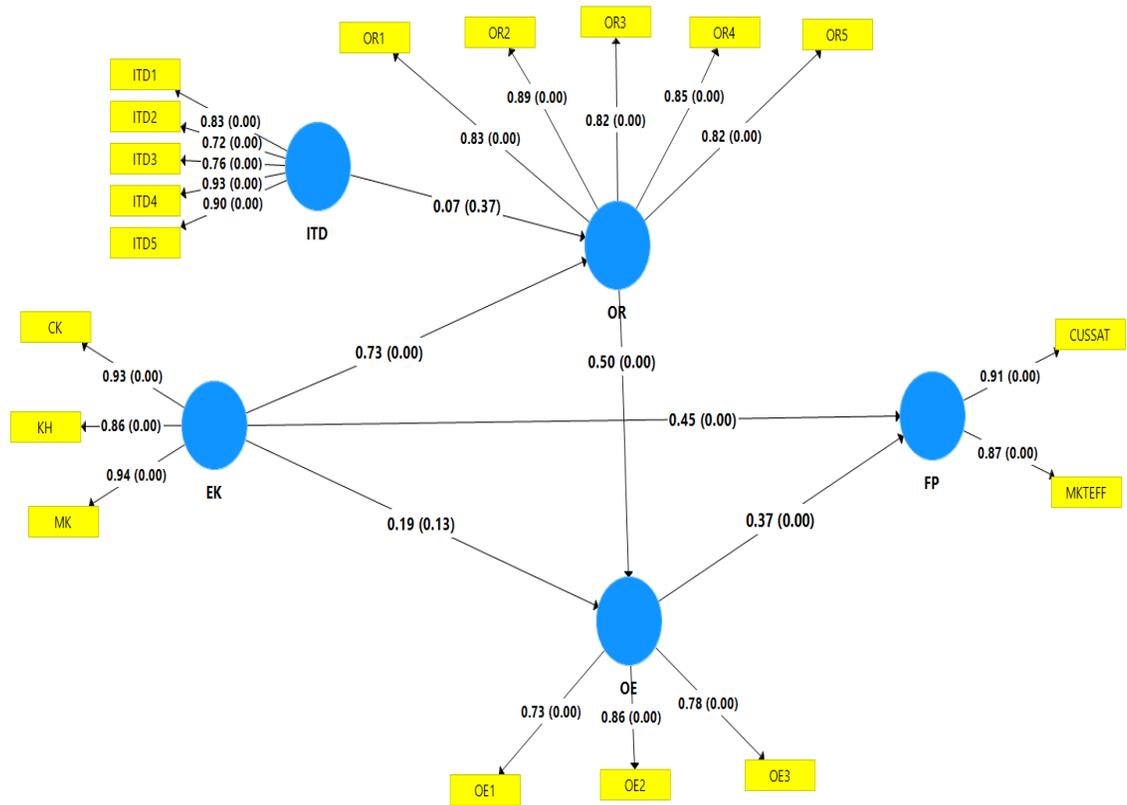


Figure 3. HOCs measurement models with LOCs as Indicators.

Table 8 shows the results of reliability and convergent validity for both HOCs. The recommended guidelines of 0.7 for reliability and 0.5 for the AVE are met for both HOCs (Hair et al., 2020). Hence, reliability and convergent validity are confirmed for both HOCs.

*Table 8. Higher-Order Constructs' (EK and FP) Reliability and Validity Metrics.*

	Average		Variance	
	Cronbach's	rho_A	Composite	Extracted
	Alpha	rho_A	Reliability	(AVE)
EK	0.90	0.91	0.94	0.83
FP	0.73	0.75	0.88	0.79

Note: EK- Entrepreneurial Knowledge; FP- Firm Performance.

Table 9 shows the results of discriminant validity of the HOCs using the Fornell-Larcker criterion. The metrics meet the recommended criteria and thus support discriminant validity (Hair et al., 2020).

*Table 9. Fornell-Larcker Criterion for the HOCs (EK and FP).*

	EK	FP	ITD	OE	OR
EK	<b>0.91</b>				
FP	0.66	<b>0.89</b>			
ITD	0.28	0.39	<b>0.83</b>		
OE	0.57	0.63	0.41	<b>0.79</b>	
OR	0.75	0.6	0.28	0.64	<b>0.84</b>

Note: Notes: EK- Entrepreneurial Knowledge; FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency.

Table 10 shows the results of HOCs discriminant validity applying the HTMT criterion. All HTMT ratios are below the recommended value of 0.85 for constructs that are not conceptually related. The HTMT ratio for the constructs FP and OE was 0.88. However, Henseler et al. (2015) suggest a threshold value of 0.90 when two constructs are conceptually very similar, which is appropriate for OE and FP. Theoretically, an entrepreneurial opportunity is generally understood to be a situation in which new goods or services can be introduced and sold at a profit above their cost of production (Shane & Venkataraman, 2000). This relationship implies the possibility of delivering superior value to the market through the creative combination of resources that meet a market need or interest (Ardichvili et al., 2003). Using bootstrapping, we also examine the range of the confidence intervals between the two constructs, OE and FP. The results show the confidence interval is between 0.192 and 0.532 and does not contain the value one (Hair et al., 2017), which confirms discriminant validity for all theoretical model constructs.

*Table 10. HTMT Criterion Ratios for the HOCs (EK and FP).*

	EK	FP	ITD	OE
EK				
FP	0.80			
ITD	0.31	0.47		
OE	0.70	<b>0.88</b>	0.51	
OR	0.83	0.73	0.30	0.81

Note: Notes: EK- Entrepreneurial Knowledge; FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency.

### 5.2.1.3 Structural Model Assessment.

The structural model is evaluated in the second step of the CCA procedure. There are six steps in structural model assessment: (1) examine multicollinearity issues; (2) evaluate path coefficients and their significance; (3) consider the  $R^2$  of all dependent variables; (4) in-sample effect size  $f^2$ ; (5) in-sample predictive  $Q^2$ ; and (6) out-of-sample prediction with the PLSpredict comparison of the PLS and LM root mean squared errors (RMSE) (Hair et al., 2020; Shmueli et al., 2019). Figure 4 illustrates the structural model.

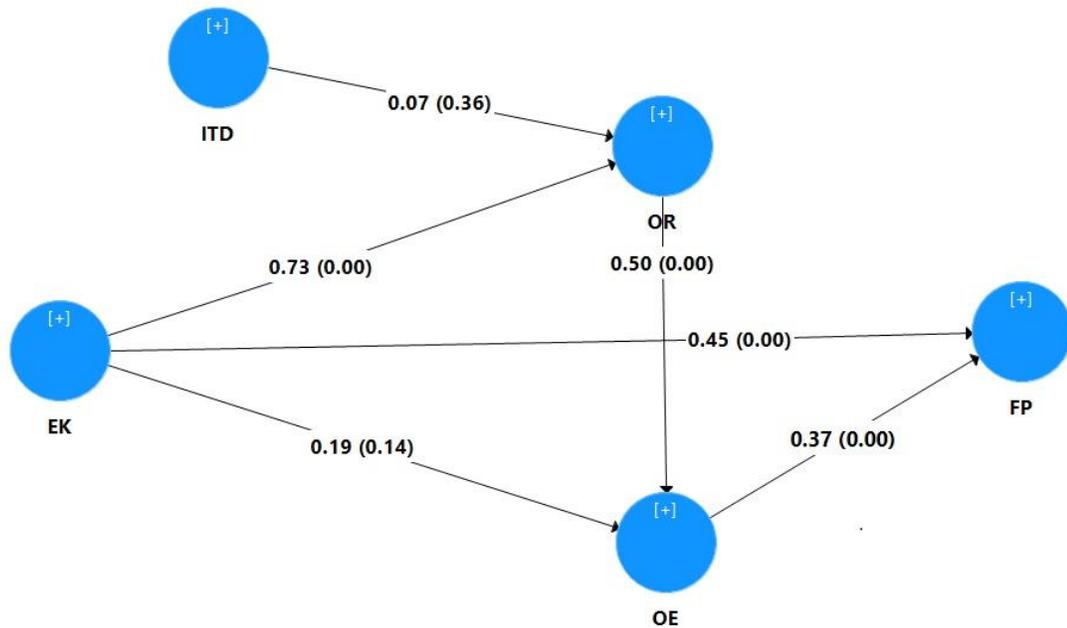


Figure 4. Structural Model Results of Hypothesized Relationships among Constructs.

First, the structural model was tested for multicollinearity among the relevant constructs. The variance inflation factor (VIF) values were used to determine if the

structural model's constructs exhibited high multicollinearity. The results in Table 11 demonstrate multicollinearity is not a problem in evaluating the structural model since the VIF values for all relevant constructs are below 3.0 (Hair et al., 2019).

*Table 11. Collinearity Statistics (VIF) – Inner VIF Values.*

	FP	OE	OR
EK	1.477	2.313	1.083
ITD			1.083
OE	1.477		
OR		2.313	

Notes: EK- Entrepreneurial Knowledge; FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency.

The PLS bootstrapping procedure was used to obtain the statistical significance of the path coefficients. In this step, the hypothesized direct and indirect relationships between the various constructs were evaluated. Bootstrapped confidence intervals were generated using 10,000 samples for bias-correction purposes (Hair et al., 2020). The results of all hypotheses are shown in Table 12. Results indicate EK is not a predictor of OE (0.194, p 0.133), and ITD is not a predictor of OR (0.074, p 0.363) based on beta coefficient sizes and lack of significance.

### A. Control Variable Relationships

Control variables were also examined for their potential impact on the exogenous constructs (Carlson & Wu, 2012). As noted in Chapter 2, new and established businesses can have a substantial impact on a small business's ability to recognize and take advantage of opportunities. To assess this potential impact, the age and size of the companies were used as control variables. A company's size and age are determined by the number of full-time employees and the number of years the business has been in operation, respectively. The path coefficients and significance levels of these control variables were examined to see if they influenced the endogenous variables OE, OR, and FP. None of the control variable relationships were statistically significant.

Table 12. Direct and Indirect Relationship (Mediation) Results.

Direct Relationships							
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Hypothesis	Decision
EK -> OR	0.733	0.73	0.06	12.26	0	H2	Accepted
EK -> OE	0.194	0.194	0.129	1.502	0.133	H1	Rejected
EK -> FP	0.449	0.448	0.084	5.327	0	H3	Accepted
Indirect Relationships (Mediation)							
EK -> OR -> OE -> FP	0.136	0.14	0.056	2.441	0.015	H5	Accepted
EK -> OE -> FP	0.072	0.07	0.048	1.492	0.136	H4	Rejected

Notes: EK- Entrepreneurial Knowledge; FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation.

Table 13. Moderation Effects on Tech and non-Tech (Traditional) Firms.

Indirect Relationships (Moderation)					
		Path Coefficients Original	p-Value	Hypothesis	Decision
Tech Firms	Moderating Effect 1 -> OR -> OE	0.11	0.462	H6-a	Rejected
Non- Tech Firms	Moderating Effect 1 -> OR -> OE	-0.224	0.434	H6-b	Rejected

Notes: OR- Opportunities Recognition; OE- Opportunities Exploitation.

### B. Direct Relationships.

For the full model evaluation, we first analyzed the hypothesized direct relationships. We evaluated the relationships between entrepreneurial knowledge (EK) and opportunity recognition (OR), entrepreneurial knowledge and opportunity exploitation (OE), and entrepreneurial knowledge and performance (FP). Results for the first hypothesis indicate EK is not a predictor of OE; the beta coefficient is small (0.194), and the relationship is not significant ( $p > .05$ ), so H1 is not supported. Results for the second hypothesis indicate a positive relationship between entrepreneurial knowledge and opportunities recognition, with a quite large and statistically significant path coefficient of 0.733 ( $p < .01$ ), so H2 is supported. Results for H3 indicate a positive

relationship between entrepreneurial knowledge and performance, with a moderate, statistically significant path coefficient of 0.449 ( $p < .01$ ), so hypothesis 3 is supported.

#### *C. Indirect Relationships (Mediation).*

We next examined the indirect effects of our mediation relationships. Mediation occurs when a third variable is present between exogenous and endogenous constructs. The mediated relationship between the exogenous and the endogenous variables is facilitated by the mediating construct (Hair et al., 2017). Results of the indirect mediating relationships between entrepreneurial knowledge and performance reveal quite small effects, and the relationships are not significant through opportunity exploitation (Beta Coefficient 0.072;  $p$  0.136). In addition, a small but significant effect was identified through the sequential mediators of opportunity recognition and opportunity exploitation (Beta Coefficient 0.136;  $p$  0.015). Thus, we reject H4 and accept H5. Results for all indirect mediated relationships for the hypothesized theoretical model are shown in Table 12.

#### *D. Indirect Relationships (Moderation).*

We hypothesize moderating relationships for hypotheses H6-a and H6-b. Moderation explains a change in the strength or direction of the relationships between variables (Hair et al., 2017). The moderating variable, Business Type as defined by IT dependence, is hypothesized to strengthen the relationship between entrepreneurial knowledge and the sequential order of opportunity recognition and opportunity exploitation in Tech companies and weaken the relationship between entrepreneurial

knowledge and the sequential order of opportunity recognition and opportunity exploitation in non-Tech companies. We also hypothesized the same moderating variable (Business Type) to strengthen the relationship between entrepreneurial knowledge and opportunity exploitation in Tech companies and weaken the relationship between entrepreneurial knowledge and opportunity exploitation in non-Tech companies. The product indicator approach is applied to assess the moderating relationships in this model because the moderating variable is measured reflectively.

To test these relationships in tech and non-tech companies, two groups were created, one representing Tech firms (Tech Firms) and the other representing non-tech firms (Traditional Non-Tech Firms). To distinguish between tech companies and non-tech companies in these relationships, a multi-group analysis was executed for the two groups. The multi-group analysis enables testing whether the pre-defined data groups have significant differences in their group-specific parameter estimates (e.g., outer weights, outer loadings, and path coefficients). SmartPLS provides outcomes based on bootstrapping results from every group. Group A was defined for tech companies (responses rate 4-10), and Group B was defined for non-tech companies (responses rate 0-3). Overall, the results indicate neither the direct relationship between ITD on OR-OE for both groups (Tech Firms,  $p = 0.529$ , and non-tech Firms,  $p = .379$ ) nor the interaction term (Tech Firms,  $p = 0.462$ , and non-tech Firms,  $p = .434$ ) was significant. So, moderation is not confirmed for either of these relationships. Thus, using the two-stage moderation approach, neither of the moderating effects for the full model was significant, and no effects of industry type on the sequential order of OR and OE. Therefore, hypotheses H6-a and H6-b are rejected. Results for all hypothesized moderated

relationships for the Tech, and non-Tech (Traditional) Firms model are shown in Table 13.

PLS-SEM analysis has the advantage of simultaneously examining all relevant relationships. As a result, I was able to determine the R<sup>2</sup> values by running all structural relationships simultaneously. R<sup>2</sup> values represent the percentage of variance explained by the independent variable in the dependent variables. Hair et al. (2017) specified three levels of R<sup>2</sup>: weak, moderate, and strong. The corresponding values for each of these levels are 0.25, 0.50, and 0.75, respectively, but these values can be adjusted depending on the context of the research. The results in Table 14 show an R<sup>2</sup> of 0.53 for FP, 0.63 for opportunity recognition, and R<sup>2</sup> of 0.43 for opportunity exploitation, all of which are considered a medium level.

*Table 14. R Square.*

	R Square	R Square Adjusted
OE	0.43	0.42
OR	0.63	0.62
FP	0.53	0.52

Notes: FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation.

For the fourth step, we examine the independent variable effect sizes measured by  $f^2$ . This is a method for estimating the predictive power of each independent construct in the model. The  $f^2$  effect size has three categories: small, medium, and large. Effects with

values between 0.02 and 0.15 are considered small, those between 0.15 and 0.35 are considered medium, and those with values above 0.35 are considered large. The effect size is used as an “in-sample” predictive metric (Hair et al., 2020). The results in Table 15 indicate entrepreneurial knowledge has an  $f^2$  effect of 0.029 on OE, considered a small effect, 1.304 on OR, considered a quite large effect, and 0.292 on FP, considered a medium effect. Also, OE has an  $f^2$  effect of 0.187 on FP, considered a medium effect. However, OR has an  $f^2$  effect of 0.005 on FP, which is a rather low but meaningful impact. Overall, all effect sizes were positive, exhibiting meaningful results.

*Table 15. The  $f^2$  effect size.*

	FP	OE	OR
EK	0.292	0.029	1.304
ITD			0.008
OE	0.201		
OR		0.187	

Notes: EK- Entrepreneurial Knowledge; FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation; ITD- Information Technology Dependency.

The  $Q^2$  value is a limited indicator of the model’s out-of-sample predictive power or predictive relevance. We use the blindfolding procedure for assessing the predictive relevance ( $Q^2$  values) of the path model. A  $Q^2$  value of zero or below indicates a lack of predictive relevance (Hair et al., 2017). In this model, the  $Q^2$  values of OE (0.255), OR

(0.412), and FP (0.408) are above zero, indicating relatively high predictive relevance for the model. Table 16 shows the results of the Q<sup>2</sup> values.

*Table 16. Q<sup>2</sup> effects.*

	SSO	SSE	Q <sup>2</sup> (=1- SSE/SSO)
FP	204	120.777	0.408
OE	306	227.929	0.255
OR	510	299.655	0.412

Note: Notes: FP-Firm Performance; OR- Opportunities Recognition; OE- Opportunities Exploitation.

Finally, we assess the PLSpredict for the path model. PLSpredict is a procedure to specifically examine “out-of-sample” prediction (Shmueli et al., 2019; Hair et al., 2020). To do so, path model predictions are generated and evaluated using training and holdout samples. The results are k-fold cross-validated prediction errors, and summary statistics like the root mean square error (RMSE), the mean absolute error (MAE), and the mean absolute percentage error (MAPE) interpreted to evaluate the predictive performance of their PLS path model for manifest variables (MV) or indicators and the latent variable (LV) constructs (Shmueli et al., 2019).

Using the PLSpredict metrics for out-of-sample prediction assessment, the structural model's ability to predict from the sample data to the population can be assessed with greater accuracy (Hair & Sarstedt, 2021). Based on the concepts of separate training and holdout samples, the PLSpredict procedure estimates model parameters and evaluates the out-of-sample predictive power of a model (Shmueli et al., 2019). The algorithm executes k-fold cross-validation samples using the entire dataset, where each fold represents a subsample taken from the entire sample, and k indicates the total number of subsamples (Hair et al., 2021).

Using the guidelines from Shmueli et al. (2019), the PLSpredict algorithm was executed with ten folds and ten replications. The SmartPLS report compared the root-mean-square-error (RMSE) values of each indicator to the linear regression model (LM) benchmark. Most of the PLS-SEM error terms for each indicator were lower than the error terms estimated from linear regression. Thus, a moderate level of predictive relevance is established by the full model (Hair et al., 2020; Manley et al., 2021). The  $Q^2$  value for the endogenous construct's indicators is also evaluated. PLSpredict  $Q^2$  values greater than zero indicate the theoretical model has predictive value for the chosen endogenous construct (Hair et al., 2017). The majority of the full model's endogenous variables are greater than zero. Hence, the model's out-of-sample predictive power is moderate (Hair et al., 2021; Manley et al., 2021).

## **CHAPTER VI: DISCUSSION AND CONCLUSIONS**

This chapter summarizes the dissertation results, implications, limitations, and future research opportunities. It is divided into four sections. First, a summary and general discussion of the findings are presented. The theoretical and managerial implications of the findings are discussed next. Third, the dissertation's limitations are acknowledged, and new research avenues are recommended. Finally, the concluding section provides an overview of the final observations and comments.

### **6.1 Summary and Discussion of the Results**

Drawing upon the theory of dynamic capabilities, the primary purpose of the study was to investigate the impact of direct and indirect effects on the relationship between entrepreneurial knowledge and the performance of SMEs in Oman. In addition, the moderating effects of business IT dependency on this relationship were examined. Thus, a theoretical model integrating direct and indirect relationships as well as moderated mediation was specified to examine the relationship between entrepreneurial knowledge and SME performance. To examine these research objectives, data gathered from a cross-sectional survey of 102 Omani entrepreneurs and managers were explored using PLS-SEM measurement and structural models.

The findings reveal two significant direct relationships. Entrepreneurial knowledge had a positive impact on both performance and the ability to recognize business opportunities. At the same time, there was a small, non-significant relationship between entrepreneurial knowledge and opportunities exploitation. Although these results did not

support the mediation role of OE in the EK and FP relationship, they do reveal a significant direct relationship between OE and FP (0.37,  $p < .01$ ). In addition, the results indicate OE is significantly related to FP when associated with OR and the indirect relationship  $EK \rightarrow OR \rightarrow OE \rightarrow FP$  is significant (0.136,  $p = 0.015$ ). This confirms the sequential relationship between OR and OE documented in previous studies (Shane & Venkataraman, 2000; McMullen & Shepherd, 2006).

While our findings suggest some of the direct relationships provide preliminary evidence to support them, further research into the path model relationships is needed. It is possible these relationships are meaningful, but the small sample size limited the ability to detect these potentially significant effects. Despite these findings, further investigation of the theoretical relationships is needed to improve our understanding of these relationships. Overall, these findings provide an initial assessment of potential relationships and implications for future research and practice.

The findings did not support the hypotheses that business IT dependency moderated the effect of entrepreneurial knowledge on OR and OE when comparing tech and non-tech companies. It is possible these results are due to the relatively small sample size or other limitations of the study. Therefore, further investigation of this potential relationship is recommended in future research.

## **6.2 Theoretical Implications**

This study has several theoretical contributions. First, previous empirical evidence of the relationship between dynamic capabilities and performance was ambiguous (e.g., Wang et al., 2014; Wilden et al., 2013; Winter, 2003). This study extended previous literature by empirically assessing the dynamic capabilities framework and its impact on firm performance in a different economic context. Economic conditions and contexts are expected to act as contingencies affecting the impact of dynamic capabilities (Fainshmidt et al., 2016). Also, the surrounding economic context is identified as a key success factor for SMEs (Zaridis & Mousiolis, 2014), and dynamic capabilities are context-dependent (Girod & Whittington, 2017). Thus, this investigation examined dynamic capabilities in a different setting and provided new contextual knowledge. The results in the new context were different from those in Western countries in testing the relationship EK-OE-FP, which suggests there may be other factors at play. Therefore, future research should investigate the factors that may contribute to different outcomes in Middle Eastern countries compared to Western countries. However, the results in testing the sequential relationship EK-OR-OE-FP were supported, and similar to those in western economic, which help support these relationships.

Second, in uncertain times, dynamic capabilities and opportunities are embedded in a company's change processes (Eisenhardt and Martin, 2000). Thus, by emphasizing and testing the role of entrepreneurs' and managers' knowledge in opportunities-driven strategic and organizational change, this study contributes to advancing the resource-based view and strategic management concepts as well as proposing a future research agenda for dynamic capability research. Therefore, a specific focus of this and future

research should be on the development of dynamic capabilities as a process at the firm level, using entrepreneurial knowledge as a starting point.

Third, this study contributes to broadening our understanding of the direct and indirect effects of the research stream on firm performance, including lower-order dynamic capabilities (opportunities), which adds to the body of knowledge regarding dynamic capabilities' concepts. In addition, the study contributes to our understanding of the role of IT in small and medium-sized businesses in developing countries in terms of driving opportunities and, consequently, firm performance, as these concepts were rarely integrated into a single study, particularly in the context of developing economies. Furthermore, the findings provide a better understanding of EK, OR, OE, and ITD as they relate to the firm performance of SMEs in developing countries and to the strategic management literature.

Fourth, very few studies have investigated opportunities recognition and opportunities exploitation as separate concepts as well as a sequential process in the same model. This study adds theoretical knowledge of these concepts and relationships by empirically examining the role of the two constructs. Future research on these potential relationships is therefore recommended.

Fifth, studies of dynamic capabilities have focused mostly on technological firms (Danneels, 2002; Teece et al., 1997; Yung-Chul, 2013) and overlooked non-technological firms, especially SMEs. But many businesses are now using technology to develop their capabilities to more effectively respond not only to rapid technological changes but also to survive the dynamism resulting from uncertain environments such as disasters, pandemics, and wars (e.g., Battisti & Deakins, 2015; Rashid & Ratten, 2020; Tomé &

Gromova, 2021). This research examines different types of businesses (technological and non-technological) and evaluates the applicability of developing dynamic capabilities in these businesses to better understand how the external environment may make changes in different industries if found.

Sixth, the study makes a methodological contribution because it is the first time PLS-SEM has been applied to analyze dynamic capabilities in a developing country context like Oman. This is an important contribution to the body of methodological literature in the field of dynamic capabilities empirical research.

Seventh, one of the positive outcomes of this study is the translated questionnaire that can be used in whole or in part for additional research in the future or for the purpose of conducting practical evaluations. This is especially important given the limited number of studies that apply to the context of countries in the Middle East. As a result, this will pave the way for additional studies to be conducted in similar settings.

Lastly, the research contributes to the strategic management and entrepreneurship fields by exploring a comprehensive model connecting entrepreneurial knowledge and resources, dynamic capabilities, opportunities, and firm performance. More importantly, the theoretical model assesses the firm's capabilities from a specific hierarchical level. That is, by testing the SMEs' performance through the lower-order dynamic capabilities of opportunities recognition and exploitation. To our knowledge, no study has focused on this approach and integration.

### **6.3 Practical Implications**

One of the practical implications of this research includes assisting companies in making decisions about how to deal with changes based on firms' entrepreneurial knowledge. As more business owners and managers realize the strategic value of entrepreneurial knowledge, they will devote more time and resources to acquiring and shaping the skills necessary to leverage that knowledge into dynamic capabilities. A comprehensive understanding of these concepts is necessary to understand how different companies have grown and achieved different levels of success. When it comes to an understanding the dynamic capabilities concepts, small business owners and managers can better understand them through the lens of opportunities. As a result, it is expected that this research will aid in broadening their horizons.

Second, when relying on knowledge as a strategic resource to develop dynamic capabilities, entrepreneurs and managers can benefit from a better understanding of how developing these dynamic capabilities is not a one-time event but rather a continuous process. That is, gaining new knowledge and learning new skills is a continuous process that should be expanded to include a longer time frame, and entrepreneurs must be able to challenge themselves to acquire new knowledge, ideas, skills, and abilities. Different entrepreneurial knowledge sources are equally likely to uncover new opportunities for companies. Therefore, companies should focus on developing and capitalizing on their knowledge and experience to apply dynamic capabilities more efficiently and effectively. The finding of this study could thus serve as a valuable guide for companies to realize the potential of superior knowledge that can be utilized to support their dynamic capabilities development.

Third, the significant direct relationship between OE and FP, and the absence of a mediated role for OE in the relationship between EK and FP, provide a better understanding for entrepreneurs in developing countries. It also reveals a gap where operational activities can be addressed to improve these relationships. Small and medium-sized businesses, for example, will need to take steps to improve their capabilities for dynamic change by understanding the role and benefits of developing these capabilities. Hence, SME managers and entrepreneurs should pay more attention to specific strategic entrepreneurial activities and behaviors related to dynamic capabilities.

Last, small and medium-sized enterprises (SMEs) must be able to develop dynamic capabilities that will enable them to progress to the next stage of performance transformation. Innovative ways of working are always needed to leverage new knowledge, create capabilities, stimulate innovation, and develop new competencies that can be used to recognize and exploit viable opportunities, which also necessitates insights from experts to serve as a reference. From a country-level perspective, policymakers can help to facilitate initiatives and training programs aimed at enhancing the capabilities of SMEs. In addition, firm capabilities can be accelerated by public policies and programs (Helfat & Peteraf, 2003). Even in developing countries, governments play an essential role in business development and substantially impact the economy (Austin, 1991). As a result, it is expected the findings of this study will be valuable to policymakers in the development of SME programs and policies in Oman and similar developing countries.

#### **6.4 Limitations and Future Studies**

There are several limitations to this study that could lead to a further, fruitful examination of the topics in the future. First and foremost, the sample provides initial but limited knowledge for evaluating the model's implied cause-effect relationship. The influence of the dynamic capabilities of OE and firm performance was not confirmed in this research. Therefore, alternative research designs such as a longitudinal design may be useful in future studies to collect multiple waves of data for further examining causal-predictive relationships.

Second, this research aims to understand relationships, mechanisms, and interpretations within a specific context, Oman. Hence, broad generalizations regarding dynamic capabilities are not possible. The findings can, however, provide helpful advice for developing countries and suggest interesting questions for future studies. The theoretical model is a guide for scholars and practitioners in this specific context. Furthermore, future studies might benefit from employing more case study approaches similar in design to this study as a comparison to gain additional insights and observations.

Third, this study tested the role of dynamic capabilities in mediating the relationship between the entrepreneurial knowledge of a firm and its performance. The study used lower-order dynamic capabilities such as exploring and exploiting capabilities to test this relationship. However, previous studies have suggested using lower-order dynamic capabilities in conjunction with higher-order dynamic capabilities to achieve superior results (Fainshmidt et al., 2016) because higher-order capabilities can be applied to better

understand lower-order capabilities (Collis, 1994). Therefore, future research could incorporate both lower-order and higher-order dynamic capabilities.

Fourth, the potential moderating effect of business IT dependency on the relationship between entrepreneurial knowledge and performance was investigated. In the future, researchers may want to consider testing a variety of potential moderators to see how they influence this relationship. Some examples of these moderators include organizational structure (Wilden et al., 2013), environmental turbulence (Protogerou et al., 2012), as well as marketing and technological capabilities (Wilden & Gudergan, 2015).

Finally, the quantitative research method was used in this study to test the hypothesized constructs that might yield generalizable results in a particular context. But to further advance the dynamic capability theory, it would be useful to conduct more mixed-method and case studies that can uncover relationships between different constructs (Edmondson & McManus, 2007; Eriksson, 2013). Dynamic capabilities could potentially be further developed in future studies by using selected advanced analytical methods such as generalized structured component analysis (GSCA).

## **6.5 Conclusions**

The dynamic capabilities theory is applied in this study to assist in understanding potentially meaningful relationships. This study contributed to the literature on dynamic capabilities and strategic management by demonstrating the impact of dynamic capabilities on the relationship between entrepreneurial knowledge and firm performance via a moderated, mediated relationship in a new context. Specifically, the findings of the

study demonstrated significant support for most direct relationships, but neither the moderating nor some mediating effects on the relationships were confirmed.

More research is needed to empirically examine the impact of dynamic capabilities on the performance of SMEs in developing countries. Future research should explore the different levels and classifications of dynamic capabilities and examine their role. Furthermore, additional research in the future could contribute to the body of knowledge by investigating different constructs (e.g., competitive orientation, organizational structure, leadership style, and innovation). Further studies are needed to explore how dynamic capabilities can be designed and developed in SMEs in developing countries to improve performance. Also, firm resources and entrepreneurial know-how in conjunction with dynamic capabilities can help companies to obtain the resources they need, create competencies, and thus improve their performance. The ongoing research in this area will help practitioners better understand dynamic capabilities frameworks and market-building exercises, which will serve as an essential catalyst for further maturity and acceptance of this strategy.

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## APPENDICES

### Appendix A - IRB Approval to Conduct Research

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#### INSTITUTIONAL REVIEW BOARD

March 7, 2022

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Principal Investigator: Naema Albimani, Business Administration (Management)  
IRB # and Title: IRB PROTOCOL: 22-028  
[1873918-1] The Impact of Dynamic Capabilities on SME Performance.  
Status: APPROVED      Review Type: Exempt Review  
Approval Date: March 7, 2022      Submission Type: New Project  
Initial Approval: March 7, 2022      Expiration Date:  
Review Category: 45 CFR 46.104 (d)(2): Research that only includes interaction involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior (including visual or auditory recording):  
  
ii. Any disclosure of the human subjects' responses outside of the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation or;

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*This panel, operating under the authority of the DHHS Office for Human Research and Protection, assurance number FWA 00001602, and IRB #00000286 or #00011574, has reviewed the submitted materials for the following:*

1. *Protection of the rights and the welfare of human subjects involved.*
2. *The methods used to secure and the appropriateness of informed consent.*
3. *The risk and potential benefits to the subject.*

The regulations require that the investigator not initiate any changes in the research without prior IRB approval, except where necessary to eliminate immediate hazards to the human subjects, and that **all problems involving risks and adverse events be reported to the IRB immediately!**

Subsequent supporting documents that have been approved will be stamped with an IRB approval and expiration date (if applicable) on every page. Copies of the supporting documents must be utilized with the current IRB approval stamp unless consent has been waived.

**Notes:**

## Appendix B - G\*Power for Sample Size Calculation

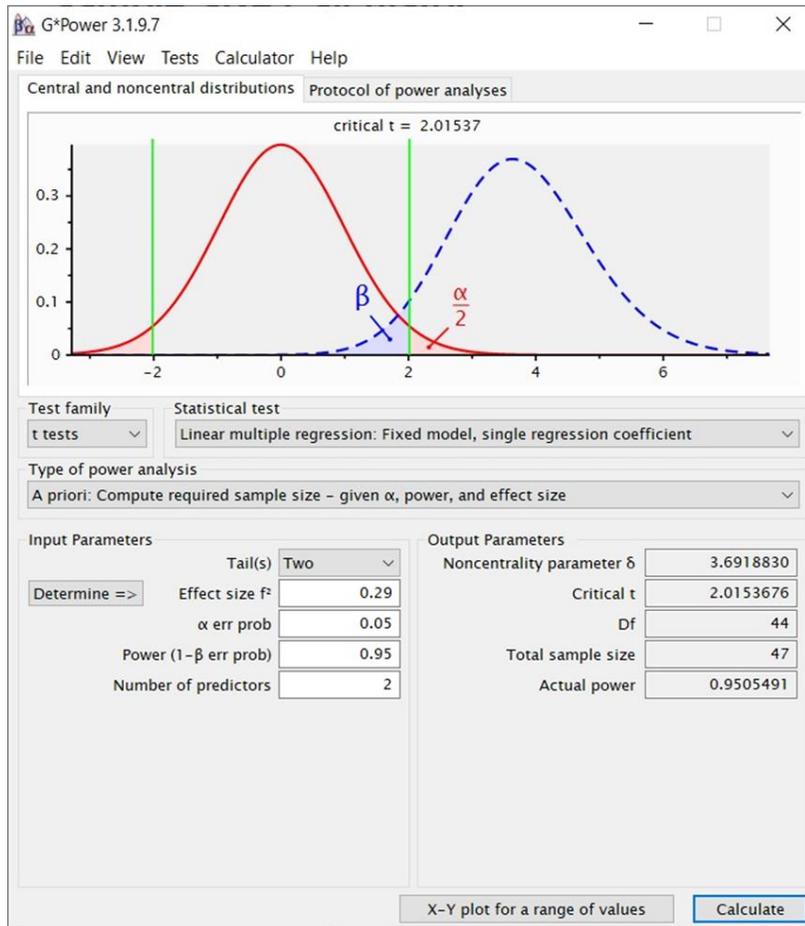


Figure 5. The G\*Power app will be used to determine the required sample size.

## **Appendix C - Consent and Survey Scales**

### **CONSENT**

A study of the dynamic capabilities of Oman's micro, small, and medium-sized businesses and how they affect firm performance.

Naema Albimani, Ph.D. Candidate

nma1923@jagmail.SouthAlabama.edu

You are invited to voluntarily participate in a research project on your perceptions about the dynamic capabilities of micro, small and medium enterprises located in Oman and how they affect firm performance. The survey has about 70 questions and will take about 10 to 20 minutes of your time.

You have the right to refuse to answer any questions that you do not wish to complete and/or answer. Your answers will remain anonymous, and no identifying data will be collected. You may receive an offer to participate in a follow-up survey in three months, but only if you provide your email address at the end. Your answers will help micro, small and medium businesses survive and grow. It is very unlikely, but possible a loss of confidentiality may occur. All responses will be saved in a password-protected file. Even if a loss of confidentiality occurs, the data will have no way to track responses from individual participants. If the findings of the study are published, all results will be presented as a group – no direct information about specific responses will be provided.

All answers will be destroyed three years after all data has been collected. All information will be used for research purposes only. If you agree to participate, you must be at least 18 years of age and proficient in English or Arabic language. You can stop

answering questions at any time. Please contact me at nma1923@jagmail.SouthAlabama.edu or the Institutional Review Board at the University of South Alabama at 1-251-460-6308 if you have questions about your rights as a research subject.

### Survey Scales

Details of construct measurement adopted from previous studies.

Construct	Component	Items	Source
Entrepreneurial Knowledge	Ability (Know-How)	<i>Indicate your level of agreement with the following sentences:</i>  <i>(Total disagreement: 0, total agreement: 10)</i>	Miralles, Giones, and Riverola (2015)
EK	KH	KH1 Thanks to our experience, we know how to start a viable business.  KH2 Thanks to our professional experience, we know clients' problems well.  KH3 It is easy for us to identify business opportunities in our professional area.	

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KH4 Thanks to our knowledge,  
we are comfortable at our  
work since we know how  
the business works.

Customer Knowledge  
CK & Market Knowledge  
MK

*Please respond to the following statements about your business:*

CK1 We ask customers what they think about our service.

CK2 We use customer information to prepare our business plans.

CK3 We have a good sense of how our customers value our products and services.

CK4 We are more customer-focused than our competitors.

Deshpande et al. (1993),  
Kropp et al. (2006)

- CK5 The customer's interest should always come first, ahead of the owners'.
- CK6 This business exists primarily to serve customers.
- MK1 We compete primarily based on product or service differentiation.
- MK2 Our products/services are the best in the business.
- MK3 Our product and service plans are based on good market.
- MK4 We have a lot of information about our competitors.

Opportunity

Recognition

OR

*Please respond to the following statements about your business:*

Kuckertz et al. (2017)

*(Strongly Disagree: 0,  
Strongly Agree: 10)*

- OR1 We always alert to business opportunities.
- OR2 We research potential markets to identify business opportunities.
- OR3 We search systematically for business opportunities.
- OR4 We look for information about new ideas on products or services.
- OR5 We regularly scan the environment for business opportunities.

Opportunity  
Exploitation  
OE

*Please respond to the following statements about your business: (Strongly Disagree: 0, Strongly Agree: 10):*

Kuckertz et al. (2017)

- OE1 We have set up our organization to pursue a business opportunity we identified.
- OE2 Based on a business opportunity we identified, we have developed a new product.
- OE3 We have asked family and friends to provide financial support for our business.
- OE4 We have asked government support programs to provide financial support for our business.
- OE5 We have asked banks and/or incubators to provide financial support for our business.

Firms Age

*Please indicate how long (years) your firm has been*

Morgan et al. (2004)

New and	<i>engaged in business</i>	and
Established	<i>operations.</i>	Osunsan et
Firms	a. Less than 5 years.	al. (2015)
	b. 6-10 years.	
	c. 11-15 years.	
	d. 16-20 years.	
	e. 21-25 years.	
	f. More than 25 years.	

Firms Size	<i>Please indicate how many</i>	The Public
	<i>full-time employees does</i>	Authority
	<i>your company have? Five</i>	for Small
	<i>or fewer workers.</i>	and
	1. Five or fewer	Medium
	workers.	Enterprises
	2. 6-25 workers.	in Oman
	3. 26-99 workers.	(Riyada),
	4. More than 100	Alyahyaei
	workers.	et al.
	<i>Please indicate how many</i>	(2020)
	<i>part-time employees does</i>	
	<i>your company have?</i>	
	<input type="text"/>	

Tech and Non- Tech Firms	Industry types	<i>Please indicate your business industry</i>	
	Degree of IT focus ITD	<i>Please indicate your business industry</i>	Kearnsa and
	ITD1	A one-hour shutdown of computers would have serious consequences.	Lederer (2004).
	ITD2	Programming errors could have serious consequences on customer satisfaction.	
	ITD3	We cannot operate our business without computers.	
	ITD4	The daily operations of the business are critically dependent on information systems.	
	ITD5	Our computers are necessary to manage our information systems.	

Performance	Customer		<i>Please evaluate the</i>	Engelen et
FP	Satisfaction		<i>performance of your firm</i>	al. (2014).
	CUSSAT		<i>over the past year relative</i>	Vorhies
			<i>to your major competitors:</i>	and
		CusSat1	Overall customer	Morgan
			satisfaction.	(2005).
		CusSat2	Delivering value to your	
			customers.	
		CusSat3	Delivering what your	
			customers want.	
		CusSat4	Retaining valued customers	
	Market		<i>Please evaluate the</i>	
	Effectiveness		<i>performance of your firm</i>	
			<i>over the past year relative</i>	
			<i>to your major competitors:</i>	
	MKTEFF	MktEff1	Market share growth.	
		MktEff2	Growth in sales revenue.	
		MktEff3	Acquiring new customers.	
		MktEff4	Increasing sales to existing	
			customers	

Classification	Age	<i>What is the age of the owner or top manager of your business?</i>
	Training	<i>Have you participated in programs providing entrepreneurial training, such as an incubator?</i>
	Gander	<i>What is the gender of the owner or top manager of your business?</i>
	Education	<i>What is the highest level of school you have completed or the highest degree you have received?</i>

**Appendix D - HTMT Metrics for EK as a HOC**

*Table 17. HTMT Metrics for EK as a HOC*

	heterotrait- heteromethod (crossloading) STEP 1	monotrait- heteromethod STEP 2	
OR	0.571533333	0.6367	
OE	0.403666667	0.440333333	
ITD	0.2086	0.6131	
FP	0.478708333	0.606071429	
STEP 3			
Correlation between LOCs	KH-CK	0.700	
	KH-MK	0.717	
	CK-MK	0.828	
STEP 4			
Construct correlation	KEYS	HTMT	HTMT (final)

Table 17. Cont.

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EK= KH-				
CK	EK-OR	0.856101227		
EK=KH-				0.82971506
MK	EK-OR	0.845891307	HTMT (EK, OR)	7
EK= CK-				
MK	EK-OR	0.787152667		
	EK-OE	0.727081487		
				0.70467188
	EK-OE	0.718410265	HTMT (EK, OE)	4
	EK-OE	0.668523901		
	EK-ITD	0.318419478		
			HTMT (EK,	0.30860537
	EK-ITD	0.314621986	ITD)	3
	EK-ITD	0.292774655		
	EK-FP	0.734953838		
				0.71230159
	EK-FP	0.72618873	HTMT (EK, FP)	9
	EK-FP	0.675762229		

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## **BIOGRAPHICAL SKETCH**

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