

12-2018

# The impact of enterprise information management capability on sustainable competitive advantage

Hayfa Mohamed Ali Mohamed Bu Hazzaa

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**UAEU**



جامعة الإمارات العربية المتحدة  
United Arab Emirates University

United Arab Emirates University

College of Business and Economics

THE IMPACT OF ENTERPRISE INFORMATION MANAGEMENT  
CAPABILITY ON SUSTAINABLE COMPETITIVE ADVANTAGE

Hayfa Mohamed Ali Mohamed Bu Hazzaa

This dissertation is submitted in partial fulfillment of the requirements for the  
degree of Doctorate of Business Administration

Under the Supervision of Professor Habib Mahama

December 2018

### Declaration of Original Work

I, Hayfa Mohamed Ali Mohamed Bu Hazzaa, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this dissertation entitled "*The Impact of Enterprise Information Management Capability on Sustainable Competitive Advantage*", hereby, solemnly declare that this dissertation is my own original research work that has been done and prepared by me under the supervision of Professor Habib Mahama, in the College of Business and Economics at UAEU. This work has not previously been presented or published, or formed the basis for the award of any academic degree, diploma or a similar title at this or any other university. Any materials borrowed from other sources (whether published or unpublished) and relied upon or included in my dissertation have been properly cited and acknowledged in accordance with appropriate academic conventions. I further declare that there is no potential conflict of interest with respect to the research, data collection, authorship, presentation and/ or publication of this dissertation.

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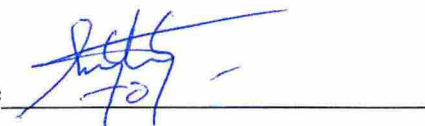
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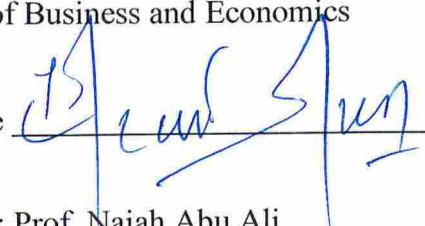
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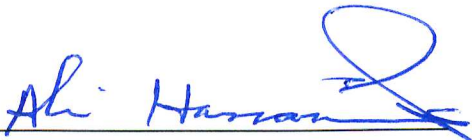
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## Abstract

In today's economic environment, intense competition in the corporate world has prompted organizations to focus on creating and maintaining a sustainable competitive advantage (SCA). The purpose of this study is to explore the impact of enterprise information management capability (EIMC) on SCA. This study focuses on EIMC as an essential organizational dynamic capability and empirically examines the relationship between EIMC and SCA, both directly and indirectly, via two mediators: knowledge management (KM) and total quality management (TQM).

This study used the theory of dynamic capability (DC) as the theoretical framework. Four constructs (EIMC, KM, TQM, and SCA) were developed and nine research hypotheses were examined. A mixed methods research design was used to collect primary data. The data was collected from twelve (12) semi-structured interviews with twelve (12) decision makers from different organizations in the UAE. In addition, an online cross-sectional survey produced 144 responses from middle level managers in UAE organizations. The survey data was analyzed using a partial least squares (PLS) approach to structural equation modelling. The results of the PLS measurement model suggest that the items used to measure the constructs were valid and reliable, and the results of the structural equation model supported every one of the research hypotheses. Moreover, the qualitative interviews' data also supported every one of the research hypotheses. Therefore, the study results suggest that EIMC impacts positively on organizations' SCA, both directly and indirectly. The indirect relationship is mediated through KM and TQM, and is serially mediated via both KM and TQM. These findings are generally consistent with the extant literature and support the notion of direct and indirect relationships between EIMC and SCA. However, the literature to date has paid little attention to these relationships.

This research contributes to the knowledge concerning EIMC, TQM and KM by providing empirical evidence of their ability to create and sustain a competitive advantage. In short, if EIMC is properly developed, it helps organizations to achieve KM, TQM and thus gain and sustain competitive advantage. Understanding the direct and indirect impacts of EIMC on SCA can positively affect organizations' performance. Further research has been recommended to further critique and



investigate the proposed model, especially in non-UAE contexts, and to extend the model by examining other mediators between EIMC and SCA.

**Keywords:** Enterprise Information Management Capability, Knowledge Management, Total Quality Management, Sustainable Competitive Advantage, Dynamic Capability.

## Title and Abstract (in Arabic)

### تأثير قدرة إدارة المعلومات المؤسسية على الميزة التنافسية المستدامة

#### الملخص

في ظلّ الظروف الاقتصادية الحالية، تلعب المنافسة الشديدة بين الشركات دوراً كبيراً في تحفيز المؤسسات على توجيه اهتمامها نحو اكتساب ميزة تنافسية مستدامة والحفاظ عليها. تهدف هذه الدراسة إلى الوقوف على مدى تأثير قدرة إدارة المعلومات المؤسسية على تحقيق وضمان ميزة تنافسية مستدامة. تنظر هذه الدراسة إلى قدرة إدارة المعلومات المؤسسية على أنها قدرة مؤسسية ديناميكية أساسية، كما تفحص بطريقة تجريبية العلاقة بينها وبين الميزة التنافسية المستدامة، سواء كانت هذه العلاقة تتم بطريقة مباشرة أو غير مباشرة من خلال وسيطين اثنيين وهما: إدارة المعارف وإدارة الجودة الشاملة.

تتخذ هذه الدراسة من نظرية القدرة الديناميكية إطاراً نظرياً لها. وبالتالي، فقد تم وضع بنية قائمة على أربعة مفاهيم (قدرة إدارة المعلومات المؤسسية، وإدارة المعارف، وإدارة الجودة الشاملة والميزة التنافسية المستدامة)، في حين تم إخضاع تسع فرضيات بحثية للاختبار. وفي إطار جمع البيانات الأولية الضرورية لهذه الدراسة، تم اللجوء إلى نهج مختلط الأساليب، حيث تم تجميع البيانات من خلال اثنتي عشرة (12) مقابلة شبه منظمة مع اثني عشر من صنّاع القرار في مؤسسات متنوّعة في دولة الإمارات العربية المتحدة، ومن الناحية الأخرى، فقد تم إجراء استبيان إلكتروني استهدف مختلف القطاعات، تمّ من خلاله الحصول على مائة وأربعة وأربعين (144) عينة قابلة للدراسة من مدراء من الدرجة المتوسطة يعملون في مؤسسات في دولة الإمارات العربية المتحدة. وقد تمّ تحليل البيانات الواردة في الاستبيانات باستخدام برنامج SMART PLS لنمذجة المعادلة الهيكلية. وتشير نتائج نموذج القياس القائم على نمذجة المعادلة الهيكلية (PLS) إلى أنّ العناصر التي تمّ استخدامها في قياس المفاهيم كانت سليمة وموثوقة، علاوة على ذلك أيدت نتائج نموذج المعادلة الهيكلية جميع فرضيات البحث. وبالإضافة إلى ذلك، دعمت البيانات النوعية للمقابلات جميع فرضيات البحث. تقترح هذه الدراسة أن لقدرة إدارة المعلومات المؤسسية تأثيراً إيجابياً مباشراً وغير مباشر على تحقيق وضمان ميزة تنافسية مستدامة. وأن العلاقة الغير مباشرة هي من خلال كل من إدارة المعارف وإدارة الجودة الشاملة على حده كوسيطين، وكذلك من خلال وساطة متسلسلة لهما. وبالتالي،

تتوافق نتائج هذا البحث على وجه العموم مع معظم المؤلفات التي تم مراجعتها في هذا الإطار، كما تؤكد النتائج العلاقات المباشرة وغير المباشرة بين قدرة إدارة المعلومات المؤسسية والميزة التنافسية المستدامة، وهي علاقات لم تولها المؤلفات المتوفرة حالياً قدرًا كافيًا من الاهتمام.

يسهم هذا البحث في تعزيز المعرفة المرتبطة بمفاهيم قدرة إدارة المعلومات المؤسسية، وإدارة الجودة الشاملة وإدارة المعارف من خلال توفير أدلة تجريبية حول دور قدرة إدارة المعلومات المؤسسية في الحفاظ على الميزة التنافسية. وباختصار، فإن قدرة إدارة المعلومات المؤسسية تسهم ما لو تم تطويرها على نحو صحيح في مساعدة المؤسسات على التوصل إلى إدارة المعارف، وإدارة الجودة الشاملة وبالتالي تحقيق ميزة تنافسية مستدامة. إن تفهم الآثار المباشرة وغير المباشرة لقدرة المؤسسات المرتبطة بإدارة المعلومات على منح المؤسسات ميزة تنافسية والحفاظ عليها قد يعود بأثر إيجابي على أداء تلك المؤسسات بوجه عام. وقد تمت التوصية بإجراء مزيد من البحوث للنقد والتحقق من النموذج المقترح في هذا البحث ودراسته بصفة خاصة في نطاق آخر غير دولة الإمارات العربية المتحدة، وكذلك من خلال توسيع نطاق النموذج المقترح من خلال اختبار وسائط أخرى قد تكون قائمة بين قدرة إدارة المعلومات المؤسسية والميزة التنافسية المستدامة.

**الكلمات الرئيسية:** قدرة إدارة المعلومات المؤسسية، إدارة المعرفة، إدارة الجودة الشاملة، الميزة التنافسية المستدامة، القدرة الديناميكية.

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## Dedication

*I dedicate this thesis to the memory of my beloved father*

*Mohamed Ali Bu Hazzaa (1944 – 2003)*

*Whose strength, love, determination and courage spurred me on.*

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## **Chapter 1: Introduction**

### **1.1 Overview**

In today's turbulent and competitive environment, sustaining a competitive advantage is one of the biggest challenges facing businesses. Developing a competitive advantage has become an imperative for success (Schaltegger & Wagner, 2006) and an important strategic management issue (Rahimli, 2012). Nevertheless, only a few organizations succeed in their endeavors to sustain a competitive advantage. The existing literature suggest that a sustainable competitive advantage requires dynamic organizational capabilities to ensure that organizations not only create competences in their areas of pursuit, but are also able to adapt, change and realign these competences in a dynamic and competitive corporate world (Teece, 2007). Drawing on the theory of dynamic capability, this study aims to examine the relationship between enterprise information management capability (EIMC) and sustainable competitive advantages (SCA), and assess whether that relationship is mediated by knowledge management (KM) and total quality management (TQM).

The literature recognizes information management capability as an enabler in creating and sustaining a competitive advantage. Information management capability plays a role in developing other organizational capabilities, such as those of customer management, process management and performance management. Thus, these capabilities influence customer, financial, human resources, and organizational effectiveness measures of a firm's performance in a favorable manner (Mithas et al., 2011). In order to maximize business performance and minimize exposure to competitive risks, organizations should effectively manage information as a strategic asset (Hausmann et al., 2014).

While information management is vital to SCA, most of the existing research focuses on information management at the level of a specific business unit, rather than engaging with it as an integrated discipline for structuring, describing and governing information assets across whole organizations. Given that SCA requires a “whole organization” approach, it is vital to examine the impact of managing information on SCA, with a focus on “enterprise/whole-organization” information management capabilities (i.e. enterprise information management capability).

While some studies have found a significant link between information technology management and a firm’s performance, others have failed to do so (Tanriverdi, 2005). One explanation for these inconsistent findings is that the causal chain from IT to a firm’s performance is complicated and extended and that most studies have overlooked important intermediate organizational capabilities that mediate the relationship between IT and a firm’s performance (Sambamurthy et al., 2003; Mithas et al., 2004). This suggests that the relationship between EIMC and SCA may be mediated by other intermediate organizational capabilities. In this study, the focus is on the mediating roles of two intermediate capabilities: namely, knowledge management (KM) and total quality management (TQM).

The objective of this research is to develop a model for achieving SCA based on EIMC, KM and TQM criteria in order to highlight, and better recognize, the role that EIMC plays in achieving SCA, and to explore the mediating roles of KM and TQM in the relationship between EIMC and SCA. In other words, it investigates the impact of EIMC as a dynamic capability in achieving SCA, either directly or indirectly, via the mediating role of KM and TQM in a turbulent business environment.

A significant number of studies have suggested a positive relationship between KM and competitive advantage (Chuang, 2004). Knowledge management is a dynamic process that creates, stores, applies, transfers and uses knowledge (García-Fernández, 2015). The literature investigating the antecedents of effective KM, in turn argue that information management systems such as document management systems, search engines, decision support systems, and data warehouses facilitate KM processes in any given company (Wang et al., 2007). Consequently, it is critical to examine whether, and how, the effect of EIMC on SCA is mediated by KM.

Additionally, most of the literature considers total quality management (TQM) as a prerequisite for achieving and sustaining a competitive advantage (Nasseef, 2010). Total quality management is a philosophy that seeks to focus all the organization's integrated functions on meeting customer needs and the company's own objectives. Adopting a TQM framework involves processes such as benchmarking and internal self-assessment, and provides guidance for developing strategic capabilities that contribute to positive results and a sustainable competitive advantage (Zárraga-Rodríguez & Alvarez, 2013). In brief, the literature suggests that the adoption of TQM approaches is crucial in sustaining a competitive advantage via KM. The literature also suggests that information management capability is vital for the implementation of TQM. For example, Matta et al. (1998) have pointed out that information systems (IS) and information technology (IT) are critical elements in the implementation of TQM. Hemswoth et al. (2008) stated that when implementing quality management practices, a specific IS is required to assist organizations to improve their performance. In short, the literature anecdotally suggests that information management capability is vital for implementing TQM. Therefore, the present study explores whether, and how, TQM mediates the relationship between EIMC and SCA.

In short, this study is motivated by and based on three basic pillars. The first is the significant focus on how to achieve sustainable competitive advantage, which existing literature still obscure. Second, is the currently limited understanding of how enterprise information management capability contributes to SCA. Thirdly, the inconsistent research results in the literature about the impact of information management capability on SCA, which maybe led by the neglecting vital intermediate capabilities such as KM and TQM.

## **1.2 Research Gap**

Despite the widespread belief that information management capability (IMC) enhances organizational performance, there are still few empirical studies that have developed a model for the relationship between EIMC, TQM, KM and SCA. It is worth mentioning here that the main difference between IMC and EIMC is that IMC is practiced in silos (at application or departmental level, etc.) while EIMC is an enterprise-wide integrative capability, where maximum attention is given to consistency, transparency and the ability to share information (Newman & Logan, 2006). Ling et al. (2014) have argued that information infrastructure capability has the potential to enhance organizational competitive advantage, and they recommend further studies to evaluate the relationship between data management capability (or as other researchers have called it, enterprise information management capability) and competitive advantage. Currently, few empirical studies examine the impact of information management capability on TQM. The few studies that have examined this relationship tend to focus on information management at the specific business-unit level rather than engaging with it at whole enterprise level. Given that SCA, TQM and KM adopt a “whole organization” approach, it is vital that research, which examines

the impact of information on SCA, TQM and KM, focuses on “enterprise/whole-organization” information management capability. As there are only a few empirical studies that have investigated the relationship between EIMC and organizational outcomes (Hausmann et al., 2014), this research aims to examine the relationships between EIMC, SCA, KM and TQM.

Some scholars have suggested a positive relationship between KM processes and a sustainable competitive advantage. That said, how this relationship operates has not been rigorously investigated. For example, Chuang (2004) recognizes the need for more robust research to discover the antecedences and consequences of this relationship. Furthermore, Chuang et al. (2013) have recommended that to understand the effect of KM on a firm’s performance more clearly, studies should focus on the performance effects of KM where information technology support is required. Furthermore, Ling et al. (2014), argue that diverse KM research perspectives have not yet covered the information infrastructure capability that business managers and practitioners require. It is worth mentioning here that information infrastructure capability (Ling et al., 2014) is considered as a bundle of capabilities (i.e. dynamic capability, data management capability, security capability, utility capability and collaboration capability). I treat this, in my research, as enterprise information management capability.

This research is significant because it unites the disparate literature on enterprise information management, and other managerial disciplines, such as TQM and KM. There is a gap in EIM, KM and TQM literature. The lack of a unified conceptual model to describe the relationship between EIMC and SCA is a great challenge in the field of EIM research.



In the UAE national context, it is worth noting that despite the wealth of literature on KM, TQM and EIM elsewhere, there are still too few studies that investigate KM and TQM practices, and EIM capability, as factors contributing to sustaining a competitive advantage. This research aims to bridge the gap in the extant literature in this field.

### **1.3 Research Questions**

This research seeks to contribute to literature in the field by investigating the impact of EIMC on KM, TQM and SCA in an empirical manner. To achieve this aim, this research focused on answering the following research questions:

1. What is the impact of enterprise information management capability on sustainable competitive advantage?
2. Is the relationship between enterprise information management capability and sustainable competitive advantage mediated by knowledge management, total quality management and/or by both of these?

The following sub-questions were addressed to answer the main research questions:

- a) Does EIMC have a direct positive relationship with SCA?
- b) Is the relationship between EIMC and SCA mediated by TQM?
- c) Is the relationship between EIMC and SCA mediated by KM?
- d) Is the relationship between EIMC and SCA serially mediated by KM and TQM?

#### **1.4 Overview of the Research Design**

This research adopted a mixed methods design that involved semi-structured interviews and a survey. Twelve interviews were conducted with managers from a cross section of UAE organizations. Additionally, one hundred and forty-four (144) mid-level managers took the survey. The data for both the qualitative and quantitative stages was collected between October 2016 and February 2017.

#### **1.5 Summary of Findings**

The data from the surveys was used to test the nine hypotheses proposed in the study. The hypotheses were supported by the results of a PLS structural model and by further evidence from the semi-structured interviews. The results are summarized in Table 1.

Table 1: Questions and Concerned Hypothesis Summary

Question	Hypothesis	Quantitatively & Qualitatively Supported
<b>Q1.</b> Does EIMC have a direct positive relationship with SCA?	<b>H1:</b> Enterprise information management capability will have a direct positive relationship with sustainable competitive advantage.	Yes
<b>Q2.</b> Is the relationship between EIMC and SCA mediated by TQM?	<b>H2:</b> Enterprise information management capability will have a direct positive relationship with total quality management.	Yes
	<b>H3:</b> Total quality management will have a direct positive relationship with sustainable competitive advantage.	Yes
	<b>H7:</b> The relationship between enterprise information management capability and sustainable competitive advantage is mediated by total quality management.	Yes
<b>Q3.</b> Is the relation between EIMC and SCA mediated by KM?	<b>H4:</b> Enterprise information management capability will have a direct positive relationship with knowledge management.	Yes
	<b>H5:</b> Knowledge management will have a direct positive relationship with sustainable competitive advantage.	Yes
	<b>H8:</b> The relationship between enterprise information management capability and sustainable competitive advantage is mediated by knowledge management.	Yes
<b>Q4.</b> Is the relation between EIMC and SCA serially mediated by KM and TQM?	<b>H4:</b> Enterprise information management capability will have a direct positive relationship with knowledge management.	Yes
	<b>H6:</b> Knowledge management will have a direct positive relationship with total quality management.	Yes
	<b>H3:</b> Total quality management will have a direct positive relationship with sustainable competitive advantage.	Yes
	<b>H9:</b> The relationship between enterprise information management capability and sustainable competitive advantage is serially mediated by knowledge management and total quality management.	Yes

## 1.6 Significance of the Research

Investigating EIMC will advance both theoretical and practical knowledge and can assist organizations to become more effective in their information management activities (Hausmann et al., 2014). This research aims to contribute to theory and practice in, at least, three ways.

As discussed above, only a few studies have examined the role of information management capability in the context of KM, TQM and SCA. The few existing studies have tended to focus on IM at an individual level (i.e. the silo approach) rather than engaging with it as an integrative discipline for managing information assets across a whole organization i.e. the enterprise-wide approach (White, 2015; Rashkino & Logan, 2012; Newman & Logan, 2006). The present study seeks to contribute to the extant literature by focusing on information management capability at the level of the enterprise (EIMC).

Organizational decision makers who deal with EIMC face the challenge of gaining support from decision makers. One of the main reasons behind a lack of support or commitment is the difficulty of illustrating the overall benefits of EIMC and, in particular, of showing the direct, and indirect, impact of EIMC on any given firm's sustainable competitive advantage. This research contributes to information management literature by providing evidence of how EIMC contributes to SCA, both directly and indirectly, via KM and TQM. It provides a framework for an improved understanding of the organizational value of enterprise information management.

In addition, by examining the impact of EIMC on KM, TQM and SCA, the findings of this study can be extrapolated and applied to any organization that adopts EIM, KM and/or TQM practices, and is interested in improving and sustaining its

competitive advantage. For example, exploring the influence of EIMC on KM, TQM and SCA enables decision makers to allocate their resources appropriately to achieve the desired SCA. The proposed model can assist managers and decision makers to recognize the importance of EIMC as a valuable organizational capability that contributes to the company's TQM, KM and SCA. This research argues that it is necessary to explore the relationship between EIMC and SCA, and that doing so provides insights into these relationships and can lead organizations to a better understanding of EIMC's role in creating and sustaining a competitive advantage.

### **1.6.1 Contribution to UAE Economy**

With a recent abrupt decline in global oil prices, the UAE has an urgent need to foster SCA in its organizations. In order to mitigate instability in oil prices and improve the country's economic performance, the government took the step of confronting both current and imminent challenges by, for example, encouraging organizations to achieve superior performance in as many of their fields and functions as possible. This is facilitated by organizations such as the Sheikh Khalifa Excellence Award (SKEA) and the Dubai Quality award (DQA). These initiatives distinguish organizations displaying superior performance and share best practices across the country as a whole.

Previous literature on the subject suggests that SCA requires several contributory factors, such as TQM. The present study seeks to improve understanding by further investigating the role that EIMC plays in achieving SCA, and the role that EIMC plays in involving TQM as a factor in this endeavor.

Another initiative in the UAE to face the challenges of today and the near future was to diversify production systems and industries to get away from an exclusive

dependence on oil, and to arrive at a knowledge-based economy as part of its 2021 Vision (Parceró & Ryan, 2016). In an information-based and knowledge-based economy, managing knowledge is a means of doing business and improving organizational performance (Alrawi et al., 2016). Adopting diversification strategies and utilizing knowledge as an economic basis require organizations in the UAE to create and improve their KM processes. As such, this research contributes to such goals by investigating the relationship between EIMC and KM and the effect of these two management disciplines on the SCA of UAE organizations.

### **1.7 Definitions of Constructs**

Operational definitions to the four constructs are presented in this section. Sustainable competitive advantage is defined as a firm's ability to consistently produce above average market returns and to persistently show a superior business performance over its competitors (Young, 2015).

TQM is "a holistic management philosophy aiming at continuous improvement in all functions of an organization to produce and deliver commodities or services in line with customers' needs or requirements by better, cheaper, faster, safer, easier processing than competitors', with the participation of all employees under the leadership of top management" (Demirbag et al., 2006, p. 830).

Knowledge management is, "a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities such as problem solving, dynamic learning, strategic planning and decision-making" (Gupta et al., 2000, p. 4).

Enterprise information management (EIM) is been defined as, “an integrative discipline for structuring, describing and governing information assets, regardless of organizational and technological boundaries, to improve operational efficiency, promote transparency and enable business insight” (Newman and Logan, 2006, p. 1). It is worth mentioning here that given my focus on EIMC, I conceptualize EIMC as a dynamic capability which is made up of information management processes that dynamically integrate, configure, gain and release resources to fit in with, or initiate, market change in order to support superior long-term business performance.

## **1.8 Organization of the Dissertation**

The chapters of this dissertation are structured as follows:

### **1.8.1 Chapter 1 - Introduction**

This chapter provides a summary. It covers an overview, the research gap, research questions, an overview of the research design, a summary of the findings, the significance of the research and the contribution to knowledge and the field of management studies in the UAE.

### **1.8.2 Chapter 2 - Literature Review**

The literature review focuses on relevant literature and covers what has been written regarding the independent and dependent variables involved. That is, sustainable competitive advantage, total quality management, knowledge management and enterprise information management capability. The antecedents and the impacts of each variable are discussed.

### **1.8.3 Chapter 3 - Theoretical Framework and Hypotheses Development**

This outlines the theoretical framework that informs the study. Here, enterprise information management capability is theorized as a dynamic capability. Following this, a conceptual model is proposed, and hypotheses are developed concerning the direct and indirect relationships represented by the model.

### **1.8.4 Chapter 4 - Research Methods**

This chapter covers the methodological approach followed in the dissertation. It describes the research paradigm, the qualitative and quantitative research approaches, the ethical considerations raised by both of these approaches to research, a sample and a discussion of the data collection methods.

### **1.8.5 Chapter 5 - Analysis and Results**

This chapter deals with the procedures used to analyze the data and reports on the robustness of the hypotheses. In particular, this chapter reports on the partial least squares (PLS) approach used to analyze the survey data (both measurement and structural models) and the interpretation of the semi-structured interviews in light of the hypothesized relationships presented in Chapter 3.

### **1.8.6 Chapter 6 - Discussion and Conclusion**

The discussion chapter starts with the research objectives and prepares the reader for the research results. Then there is a summary of the research findings. This final chapter also presents the limitations of the study and makes suggestions for future research. It discusses the theoretical and practical contribution of this research and draws some conclusions from it. It also highlights the importance of studying the



impact of EIMC on KM, TQM, and SCA, and provides recommendations to UAE organizations in this regard.

## **Chapter 2: Literature Review**

### **2.1 Introduction**

Chapter 2 discusses the relevant literature on sustainable competitive advantage, total quality management, knowledge management, enterprise information management capability, and the relationships between these concepts.

### **2.2 Documentation**

A literature search helped to identify relevant articles from Year 2015 to 2017. A total of 167 references were used in this study, 82.6% of them are dated from Year 2000 to 2017. It was achieved through two main search engines: UAEU's online library and Google Scholar. Most of the relevant material was available through UAE University's online library. The search used keywords and headings to identify articles containing six main themes: enterprise information management (EIM), sustainable competitive advantage (SCA), knowledge management (KM), total quality management (TQM), dynamic capabilities (DCs) and the economy of the UAE. These key words included definitions of EIM, SCA, KM, TQM, and DCs; their antecedents, benefits and challenges as well as probing the relationships between EIM, or any of its dimensions, and KM. The search also looked at the relationship between EIM and SCA; the relationships between EIM and TQM; the relationships between KM and SCA; the relationship between TQM and SCA and the relationship between KM and TQM. The search was limited to English language publications and only looked for peer-reviewed articles. As far as possible, the latest articles were sought out and consulted.

### **2.3 Sustainable Competitive Advantage**

Organizational competitiveness has attracted the attention of strategic management literature due to its importance to organizational success. According to Zairi (2005), in order to survive in the current business environment, organizations need to keep improving. Porter (1985), a well-known commentator on this subject, was first to introduce the concepts of competitive advantage, competitive strategies and competitive forces. Porter (1985, p. 3) defined competitive advantage as, “the ability to produce a superior product and/or bring the product to market at a lower price than most, or all, of their competitors and thus attain a position of relative advantage; the challenge is to sustain any advantage once achieved”. According to Porter (1985), the main resources that enable organizations to achieve a competitive advantage are a low cost strategy and a differentiation strategy. These strategies allow organizations to bring a product to the market and/or create a superior product at an average, or lower than average price for the particular industry. Cost-efficient leadership, and tightly regulated cost controls define a low cost strategy. Differentiation is defined as the means that provide a unique brand, technology, products and/ or customer services in order to gain market share (Porter, 1985). Leonard-Barton (1995, p. 4) claimed that progressively developed core capabilities constitute any firm’s competitive advantage.

A modern dynamic global business environment has compelled organizations not to be content with having a competitive advantage but to keep improving and developing in order to survive. In line with this, Young (2015) highlights the importance of a firm’s ability to consistently produce above average market returns and to persistently show a superior business performance over its competitors. He recognizes these as two important measures of a firm’s sustainable competitive

advantage. For example, Zairi (2005) has argued that, to survive and to sustain its competitive advantage in the modern business environment, an organization needs to keep on improving. Along similar lines, Porter (1990) argued that improving your competitive advantage is the only approach that leads to a sustainable competitive advantage. According to Aras and Crowther (2010), and Liu (2013), sustained competitive advantage is evident only in successful organizations. A sustainable competitive advantage is defined as the ability to develop internal foundations and processes that lead organizational personnel to generate specific competencies so the business can adjust to constant alterations of its strategic and customer demands (Ulrich and Lake, 1990). Similarly, Barney (1991) argued that to sustain competitive advantage an organization needs to implement strategies that use its internal strengths to the full. The company should respond to environmental opportunities, defuse external threats and prevent losses attributable to internal weaknesses. Furthermore, he argued that a sustained competitive advantage was evident in firms that have a value creation strategy, while their competitors do not. Such companies seek to multiply the benefits of such a strategy.

Aras and Crowther (2010) claimed that a sustainable competitive advantage comprised of four components: profitability, sustainability, corporate reputation and good governance. It is when these four components coincide that sustainable competitive advantage (SCA) can be achieved. These aspects can be represented on a two-dimensional matrix along polarities of internal versus external focus, and a short-term versus long-term approach to these four aspects. It is worth mentioning that Aras and Crowther (2010) have re-evaluated the factors that constitute a sustainable competitive advantage in a holistic manner by considering the company as a whole and viewing the way in which each components is addressed within the company as a

whole. This approach is in line with earlier argument in chapter one (introduction) and the argument below (chapter three), that enterprise information management capability, knowledge management and total quality management are approaches that should be studied holistically in order to investigate their impact on sustainable competitive advantage of an organization. According to Aras and Crowther (2010), only an excellent business has any form of competitive advantage. Thus, business excellence is a state to which business can, and should, aspire. Figure 1 illustrates a model of the four equally essential factors required to achieve any sort of sustainable competitive advantage based on Crowther (2010).

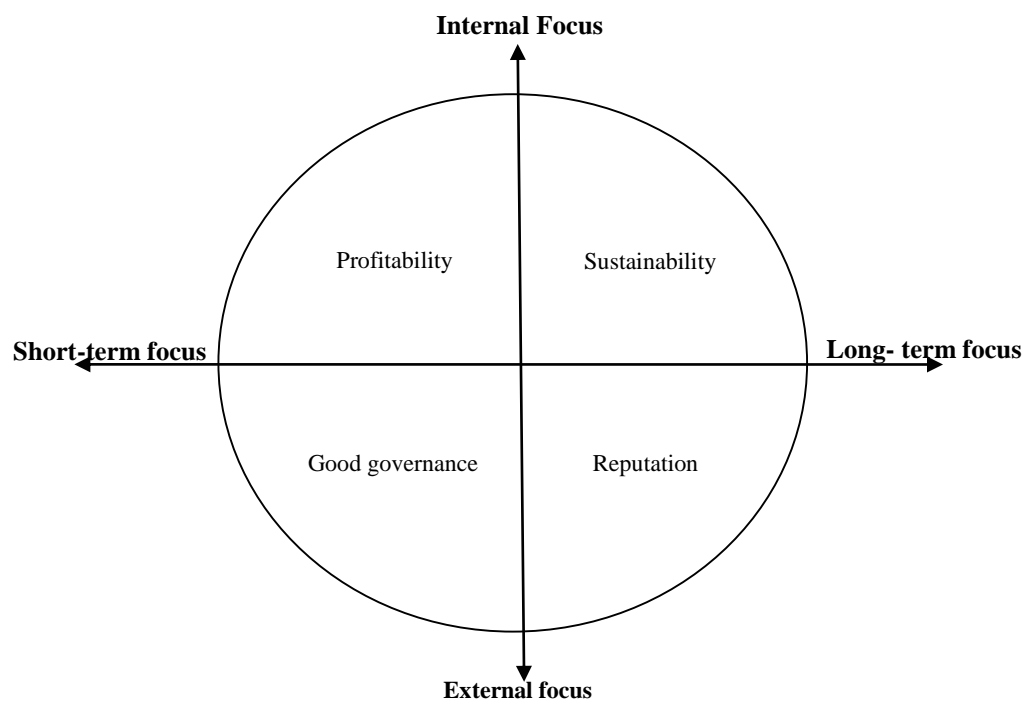


Figure 1: Components of Sustainable Competitive Advantage  
(source: Aras & Crowther, 2010, p. 566)

According to Aras and Crowther (2010), each of the four facets (i.e. profitability, sustainability, corporate governance and corporate reputation) is vital to business success, but only leads to excellent performance (sustainable competitive advantage) when combined. The definitions for the four components of sustainable business excellence (sustainable competitive advantage) are shown in Table 2.

Table 2: The Definitions of Sustainable Business Excellence  
(Sustainable Competitive Advantage) Components (Aras & Crowther, 2010)

<b>Components of Sustainable Business Excellence</b>
Profitability: An adequate return for the level of risk undertaken.
Sustainability: Concerns the effect of action taken in the present on the options available in the future.
Corporate Governance: Concerns creating a balance between the economic and social goals of a company, such as the behavior of a corporation in its social environment.
Corporate Reputation: An intangible factor that is often the most important factor for gaining a competitive advantage, as well as building financial and social success.

### **Profitability:**

Hendricks and Singhal (1997) measured profitability as the operating income of a company before depreciation, taxes and interest. Thus, it represents economic value and a short-term focus on organizational performance. According to Fillis and Rentschler (2010), advances in globalization and technology increase opportunities for entrepreneurs. Therefore, as opportunities increase competition increase too, thus creative solutions are needed to improve profitability and sustainability. According to Gorgievski et al. (2011), profitability along with personal satisfaction, and satisfied stakeholders ranked as the highest criteria to determine success.

Gandy (2015, p.84) suggests that knowing the seasonality of business, being passionate and dedicated to a business, and hiring the appropriate employees as critical elements to the success and profitability of small business sustaining beyond five years of being in business. Valdiserri and Wilson (2010) argue that small business organizations' employees are satisfied and motivated when appropriate leadership exists. Moreover, they go further and suggest profitable and successful small business organizations are achieved through employee effectiveness, motivation, and satisfaction. Moreover, they suggest that the lack of leadership as one of the main factors that contribute to small business failure. In brief, it is only through strong leadership and industry knowledge that businesses can achieve profitability and success (Beaver, 2003).

### **Sustainability:**

Enterprise sustainability represents the organizations survival capacity and ability to develop and retain environmental, social and economic value for its stakeholders in both the short and long term i.e. for employees, clients and wider society (Edgeman, 2015). Schaltegger and Wagner (2011) suggested that sustainable activities might improve, or retard, the main economic performance drivers such as cost, risk, turnover, price, profit margin, work satisfaction, innovation, reputation, intangibles and brand value.

According to Aras and Crowther (2008), sustainability can be measured through rate at which resources are consumed by the organization in relation to the rate at which resources can be regenerated. Thus, organizations aim to achieve sustainability through efficient resources usage. Sustainability needs to be recognized and analyzed

according to equally important four aspects, namely, societal influence, environmental impact, organizational culture, and finance (Aras and Crowther, 2008).

### **Corporate Governance:**

Aras and Crowther (2008, p. 434) considered corporate governance as, “an environment of trust, ethics, moral values and confidence”. Transparency, accountability, responsibility and fairness are indicators of good corporate governance. Aras and Crowther (2008, p. 440), state that corporate governance is the only means for companies to achieve corporate goals and strategies. Moreover, they argue that the main reasons for increasing interest in corporate governance are:

- Economic liberalization and deregulation of industries and businesses.
- The demand for a new corporate ethos.
- Stricter compliance with the law of land.
- The demand for greater accountability from companies to their shareholders and customers.

### **Corporate Reputation:**

Walker (2010, p. 370) defined corporate reputation as, “a relatively stable, issue specific, aggregate perceptual representation of a company’s past actions and future prospects compared against some standard”. According to Walker (2010), previous literature has acknowledged the relationship between reputation and a sustained competitive advantage, and the link between reputation and an organization’s performance. Thus, reputation is recognized as the most valued organizational asset. Modern day competitive markets highlight the role of reputation. A good reputation



can lead to several strategic benefits such as “lowering a firm’s costs, enabling firms to charge premium prices, attracting applicants, investors and customers, increasing profitability, and creating competitive barriers.” (Walker, 2010, p. 357)

Walker (2010) found three basic problems with the literature on corporate reputation. From a systematic review of forty-two (42) articles and books, he gleaned the following: firstly, the need for a comprehensive and well-accepted definition; secondly, the difficulty in operationalizing corporate reputation; and finally, the ongoing need for a more developed theory.

Based on this discussion we can see that the composition of all profitability, sustainability, corporate reputation and good governance is the core of any organization’s SCA.

The positive effects of SCA have been pointed out in the literature. For example, Bharadwaj et al. (1993) considered that sustainable competitive advantages are prerequisites to a sustained superior long-term performance. Gupta (2013), considered that core competencies such as pooled skills and intangible assets allowed corporations to produce better and/ or cheaper products, deliver faster execution and become more reliable.

In short, a sustainable competitive advantage is a prerequisite for sustained superior performance over the longer term. Companies need to perform in a manner that leads to differentiation and aim for a premium price structure (Bharadwaj et al., 1993). The literature also suggests that information management, KM and TQM entail critical processes that help organizations to gain and sustain a competitive advantage.

A review of these researchers' work is presented in detail in sections 2.4, 2.5 and 2.6, respectively.

## **2.4 Total Quality Management**

Most of the literature links the origin of TQM to Japanese quality management. When Japanese products penetrated the American and European markets in the 1980s, the market shares of American and European products were reduced significantly. The main reason was the non-traditional manufacturing strategies (i.e. total quality strategies) that Japanese managers relied on, and thus it became very difficult for American and European managers to compete with their Japanese counterparts and to remain dependent on traditional manufacturing strategies. This situation forced many American and European firms to re-evaluate their corporate strategies. As a result, interest in TQM grew when organizations saw it as something of a panacea to address the decline of the manufacturing sector in the West (Rehder & Ralston, 1984). Other researchers, such as Idris and Zairi (2006), argue that TQM made possible the evolution of intense quality programs such as ISO 9000:2000, which include both product quality assurance and customer satisfaction assurance.

Since TQM was introduced in 1984, understanding has grown and been enhanced due to the development of widely recognized TQM models, such as the Malcolm Baldrige National Quality Award (MBNQA) and the European Foundation for Quality Management Excellence (EFQM) Model, which were introduced in 1987 and 1991 respectively. According to Zairi (2002), quality awards are largely premised on TQM.

According to Mohammad et al. (2011), more than ninety-four (94) national quality/ business excellence (BE) awards have been used in eighty-three (83) different countries. The European Foundation for Quality Management Excellence Model (EFQM) and the Malcolm Baldrige National Quality Award (MBNQA) are the two most widely used models. The former is used in thirty countries on two continents (Europe and Asia), and the latter is used in eight countries on four continents: North America, Asia, Oceania, and Europe. Many countries also use their own national models. Most of these are based on the EFQM Excellence Model and/or the Malcolm Baldrige National Quality Award (MBNQA). Some countries have more than one national quality/ business excellence award. These countries include the United Arab Emirates, Japan, India, Malaysia and Hungary. There follows a brief description of the MBNQA and the EFQM Excellence models and their most important features. My rationale behind describing these two quality models in this research are as I aim to investigate TQM within UAE context, the TQM model used in most UAE organizations is the EFQM Excellence Model, and organizations such as the Sheikh Khalifa Excellence Award (SKEA) and the Dubai Quality Award (DQA) facilitate and acknowledge that. Second, the EFQM and the MBNQA are the most used TQM model frameworks worldwide. I aim to discuss them further to shed some light on the relationship between TQM and Information Management.

According to Zairi and Youssef (1995), the MBNQA was established by the Congress of the United States in 1987 to raise awareness of quality assurance and its importance for American business organizations. Based on 1994 award examination criteria, there were 28 critical factors covering seven key areas. These are represented in Table 3.

Table 3: MBNQA Areas and Critical Factors

Area	Critical factor	
Leadership	<ul style="list-style-type: none"> <li>▪ Senior executive leadership</li> <li>▪ Management for quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public responsibility and corporate citizenship</li> </ul>
Information and analysis	<ul style="list-style-type: none"> <li>▪ Scope and management of quality and performance data and information</li> </ul>	<ul style="list-style-type: none"> <li>▪ Competitive comparisons and benchmarking</li> <li>▪ Analysis and uses of company-level data</li> </ul>
Strategic quality planning	<ul style="list-style-type: none"> <li>▪ Strategic quality and company performance planning process</li> </ul>	<ul style="list-style-type: none"> <li>▪ Quality and performance plans</li> </ul>
Human resource development and management	<ul style="list-style-type: none"> <li>▪ Human resource planning and management</li> <li>▪ Employee involvement</li> <li>▪ Employee education and training</li> </ul>	<ul style="list-style-type: none"> <li>▪ Employee performance and recognition</li> <li>▪ Employee wellbeing and satisfaction</li> </ul>
Management of process quality	<ul style="list-style-type: none"> <li>▪ Design and introduction of quality products and services</li> <li>▪ Process management: product and service production and delivery process</li> </ul>	<ul style="list-style-type: none"> <li>▪ Process management: business and support service processes</li> <li>▪ Supplier quality</li> <li>▪ Quality assessment</li> </ul>
Quality and operational results	<ul style="list-style-type: none"> <li>▪ Product and service quality results</li> <li>▪ Company operational results</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business and support service results</li> <li>▪ Supplier quality results</li> </ul>
Customer focus and satisfaction	<ul style="list-style-type: none"> <li>▪ Customer expectations: current and future</li> <li>▪ Customer relationship management</li> <li>▪ Commitment to customers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Customer satisfaction determination</li> <li>▪ Customer satisfaction results</li> <li>▪ Customer satisfaction comparison</li> </ul>

In 1991, the European Foundation for Quality Management Excellence Model was introduced as a non-prescriptive framework for organizational self-assessment and as the basis for judging entrants to the European Quality Award (Dodangeh et al., 2012). The EFQM Excellence Model is a framework used to develop organizational awareness of the importance of quality for competing in the global market in Western countries (Saryazdi & Mehrjerdi, 2014). The EFQM Excellence Model is designed for all types of organizations and utilizes self-assessment as a strategic tool to help companies to identify their strengths, weaknesses and areas for improvement (Ismail et al., 2011).

Bolboli and Reiche (2013, p. 332) note that the EFQM Excellence Model is, “one of the few TQM frameworks that deal with complexity and dynamics and focus on aspects such as strong stakeholder orientation, environment and long term corporate success”. Unfortunately, TQM frameworks have been held back by a lack of clear implementation guidelines to assist an organization towards quality management from a system’s perspective. They often state what has to be done, but do not explain how it can be achieved.

The EFQM Excellence Model recognizes that excellence can be achieved in a sustainable manner by adopting different approaches. According to Shergold and Reed (1996) the Business Excellence Model and self-assessment can provide a structured approach to organizational improvement and integrate various quality initiatives into normal business operations.

Bou-Llusar et al. (2005) found that the EFQM Excellence Model represents a complete operational framework, which serves as a useful reference for the effective implementation of a TQM philosophy. Young Kim et al. (2010) stated that the EFQM

Excellence Model was mainly useful as a representative theory to enhance traditional TQM by expanding a limited quality-oriented concept into a more holistic management approach. Gómez et al. (2015) would advise managers to consider using excellence models, such as EFQM, as tools to find their own way towards excellence in their field. Currently, more than seven hundred EFQM members can be found in many countries across the globe (Saryazdi & Mehrjerdi, 2014). According to the EFQM (2013), around 30,000 organizations have applied their EFQM Excellence Model on their journey towards excellence, more than 4,000 assessors have been trained, and EFQM partners are present in 31 countries.

The EFQM Excellence Model is comprised of three integrated components: the fundamental concepts of excellence, criteria and radar. The fundamental concepts outline the foundations for achieving sustainable excellence in an organization. They can be used as tools to illustrate the attributes of an excellent organizational culture. EFQM is linked to eight fundamental concepts. These concepts are adding value for customers; creating a sustainable future; developing organizational capability; harnessing creativity and innovation; leading with vision; inspiration and integrity; managing with agility; success due to talent of the personnel and the sustainability of outstanding results (EFQM, 2012).

The criteria can be separated into nine areas, and thirty-two sub-criteria. They are designed to address every aspect of a company's operations (Rusjan, 2005). The enabler criterion covers what an organization does and how it does it. The results criteria look at what an organization achieves. These results are caused by the enablers, and the enablers can be improved using feedback from the results. Definitions of EFQM criteria (enablers and results) are given in Table 4 (EFQM 2013). The total

weighting for the four results and the five-enabler criteria reaches one hundred percent (100%). The enablers and the results are weighted equally (50/50). Each criterion is weighted based on its importance. For example, the most significant criterion is the customer and the key result has a 15 percent weighting (Dodangeh et al., 2012). Zárraga-Rodríguez and Alvarez (2013) stated that the EFQM Excellence Model utilizes a resource-based view (RBV) as its theoretical basis. They analyzed the EFQM model in detail and proved its usefulness in identifying which part of the structure generates the key resources required to create a competitive advantage.

Table 4: EFQM Criteria Definitions (EFQM 2013)

<b>Criteria</b>		<b>Definition</b>
<b>Enablers</b>	Leadership	Excellent organisations have leaders who shape the future and make it happen, acting as role models for its values and ethics and inspiring trust at all times. They are flexible, enabling the organisation to anticipate and react in a timely manner to ensure the on-going success of the organisation.
	Strategy	Excellent organisations implement their Mission and Vision by developing a stakeholder focused strategy. Policies, plans, objectives and processes are developed and deployed to deliver the strategy.
	People	Excellent organisations value their people and create a culture that allows the mutually beneficial achievement of organisational and personal goals. They develop the capabilities of their people and promote fairness and equality. They care for, communicate, reward and recognise, in a way that motivates people, builds commitment and enables them to use their skills and knowledge for the benefit of the organisation.
	Partnerships and Resources	Excellent organisations plan and manage external partnerships, suppliers and internal resources in order to support their strategy, policies and the effective operation of processes. They ensure that they effectively manage their environmental and societal impact.
	Processes, Products and Services	Excellent organisations design, manage and improve processes, products and services to generate increasing value for customers and other stakeholders.
<b>Results</b>	Customer Results	Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of their customers.
	People Results	Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of their people.
	Society Results	Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of relevant stakeholders within society.
	Business Results	Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of their business stakeholders.



The radar logic component of the EFQM Excellence Model is a dynamic assessment framework and a powerful management tool that provides a structured approach to questioning the performance of an organization. A higher level of radar logic indicates that an organization should do the following:

- Determine the results it is aiming to achieve as part of its strategy.
- Plan and develop an integrated set of approaches to deliver the required results, both now and in the future.
- Deploy approaches in a systematic way to ensure implementation.
- Assess and refine these approaches based on the monitoring and analysis of results and on-going learning activities.

While variations exist between TQM models, there are remarkable similarities as most of them are based on TQM core concepts. Several writers have concluded that the criteria for the European Foundation for Quality Management Excellence (EFQM) Excellence Model and the Malcolm Baldrige National Quality Award (MBNQA) capture the core concepts of TQM and can predict the relationships between TQM procedures and organizational performance (Calvo-Mora et al., 2015). According to Young Kim et al. (2010), EFQM and the MBNQA encourage organizations to conduct value-added audits by identifying their strengths and areas for improvement. Moreover, both models acknowledge the significance of process management in achieving higher organizational performance. According to Cragg (2005), both the MBQNA and the EFQM Excellence models draw attention to the importance of information. The MBNQA self-assessment instrument contains ten statements that can

be directly linked to information systems. The EFQM self-assessment instrument contains six statements that are also directly linked to information systems.

TQM consists of three main ideas. Total refers to all the parties associated with an organization who contribute to its continuous improvement (e.g. employees, customers and suppliers). Quality refers to customers' requirements, and management is the commitment on the part of the executives and management (Ho, 1999). Ho (1999, p. 88) has stated that, "The TQM philosophy stresses a systematic, integrated, consistent, organization-wide perspective involving everyone and everything. It focuses primarily on total satisfaction for both internal and external customers, within a management environment that seeks continuous improvement of all systems and processes".

Since the mid-1980s, TQM has become popular as a process for improving the competitiveness of Western organizations against Japanese firms, and others from emerging economies such as South Korea (Tickle et al., 2016). Most of the literature links the implementation of TQM to achieving a competitive advantage (Suárez et al., 2014; Ionică et al., 2010; Brah et al., 2002; Nasseef, 2010). According to Ho (1999), TQM results from a holistic effort that can lead to a competitive advantage by developing every facet of an organization's activities. For example, TQM can assist organizations to attain their strategic and financial goals and to achieve excellent results (Suárez et al., 2014). Firms implementing TQM are able to achieve a performance of better quality than their competitors (Brah et al., 2002).

Implementing TQM leads to several tangible and intangible benefits that can enhance an organization's competitive position. These include better quality products, faster organizational learning, the promotion of continuous improvement, an increase

in the firm's flexibility and enhanced responsiveness (Youssef, 1996). According to Mosadeghrad (2014), successful implementation of TQM leads to success in business due to fewer errors and less waste, better sales, higher productivity, greater profits, greater market share, more customer satisfaction (internal and external) and a closer relationships with stakeholders. In addition, total quality management is a vital prerequisite for any organization targeting excellence in business (Ionică et al., 2010; Idris & Zairi, 2006).

Several studies have suggested a relationship between TQM and SCA (Lakhali et al., 2006; Hafeez et al., 2006; Tickle et al., 2016). For example, the study by Lakhali et al. (2006) of the relationship between quality management practices and their impact on performance highlights the crucial role in organizational performance played by specific quality management practices. Other studies have suggested that there is a positive relationship between TQM and competitive advantage (Young Kim et al., 2010; Santos-Vijande & Álvarez-González, 2009; Abdullah et al., 2008; Idris & Zairi, 2006).

Oakland (2005, p. 1058) stated that the “TQM framework aims to promote performance excellence and improvement in competitiveness”. Lee (2002) concluded that TQM helps to enhance business excellence as it focuses on encouraging business practices that satisfy customer needs, reduce costs, increase productivity and enhance the quality of output. Seetharaman et al. (2006) recognized properly implemented TQM as a vital tool for an organization to achieve excellence in business performance.

Hafeez et al. (2006, p. 1214) have argued that TQM focuses primarily on, “achieving quality in terms of all functions of the enterprise. This includes interaction between all the components of the organization as well as the components

themselves”. Youssef (1996, p. 127) conceptualized TQM as, “An overall philosophy whose objective is to meet or exceed the needs of the internal and the external customer”. Seetharaman et al. (2006, p. 693) stated that, “TQM is only a philosophy or foundation to develop a good management system”. Furthermore, Demirbag et al. (2006, p. 830) noted that TQM was, “a holistic management philosophy aiming at continuous improvement in all functions of an organization to produce and deliver commodities or services in line with customers’ needs or requirements by better, cheaper, faster, safer, easier processing than competitors’, with the participation of all employees under the leadership of top management”.

We can conclude from the definitions above that most researchers see TQM as a holistic philosophy that aims to continuously improve the functions of an organization in order to satisfy everyone associated with the organization (e.g. employees, customers and suppliers). According to Brown (2013a), adopting a TQM framework not only provides guidance for building organizational performance, as measured by various indicators of success, but it also serves as a process for benchmarking and for internal self-assessment based around the core elements of the framework.

While TQM can improve organizational performance and competitiveness, there is also evidence of its failure to bring about the desired success. The majority of such failures are linked to an inadequate understanding of what drives effective implementation, and also how to adapt TQM to any given organization’s needs (Seetharaman et al., 2006). Seetharaman et al. (2006, p. 693) recognized the critical issues that help to improve the chances of successfully implementing TQM. These issues are, “the importance of management commitment and management

understanding of Quality and understanding of TQM guidelines, methods and implementation plan, and benefits of TQM implementation, TQM philosophy and its measurement techniques, understanding that customers are keys to the organizational success, understanding the importance of continuous improvement and incorporating it into the system”.

Implementing TQM is a complex and difficult process and the benefits are not easily achieved. It is thus important to investigate the critical success factors (CSFs) that determine the success of TQM (Mohammad, 2006). The critical success factors are, “those elements based on quality principles that should be present either as a tool, program or culture, and infrastructures that influences the implementation of quality initiatives in the workplace” (Idris & Zairi, 2006, p. 1251). Idris and Zairi (2006) claimed that since sustainability is the result of the efficiency and effectiveness of the implementation of TQM, efficiently implementing the critical factors is essential for sustaining excellence.

Zairi (2005, p. 13) stated that, “it appears that TQM Sustainability is largely dependent on the following conditions:

- An evolutionary process which moves from product, service, customer to market orientations;
- An emphasis on certain critical success factors which will ensure that TQM can be embedded in the organization concerned and which will enable performance to ensue;
- The development of a culture of TQM through continuous improvement, learning and the creation of a climate of sustainable innovation and growth;

- Putting in place a management approach which is driven by measurement using a balanced perspective.”

The literature documents several critical factors to successfully implement TQM (CFIs). According to Hietschold et al. (2014), some writers identify fewer than four CFIs, while others suggest that more than ten CFIs are required. The first major attempt to compile a list of critical factors for TQM was a study conducted in the USA by Saraph et al. (1989) in which seventy-eight (78) factors were identified. Their instrument consisted the following measures: the role of divisional top management and quality policies, the role of the quality department, training, product/service design, supplier’s quality management, process management/operating procedures, quality data reporting and employee relations.

Nasseef (2010) investigated the CFI for TQM in a longitudinal (twenty-year) study that covered seventy-nine (79) winners of the prestigious MBNQA. He identified twenty-four (24) critical factors and categorized them under seven main headings. He then verified the continuous existence of seven CFIs: leadership and commitment from top management, strategic planning and development, customer management, information management and analysis, people management, partnership and supplier development, and process management. It is worth mentioning that the management of data and information was explicitly defined as a key factor in information management and analysis.

Hietschold et al. (2014), in their systematic literature review of one hundred and forty-five (145) studies, divided the critical success factors into eleven (11) distinct dimensions: human resource management (HRM) / recognition/ teamwork; top management commitment and leadership; process management; customer focus and

satisfaction; supplier partnerships; training and learning; information/ analysis/ data; strategic quality planning; culture and communication; benchmarking and social and environmental responsibility. Calvo-Mora et al. (2015) identified common CFIs as leadership, strategic planning, continuous improvement, customer focus, information-based management, human resources management, process management and control, and supplier management.

Brah et al. (2002) described seven dimensions of quality management implementation. These constructs were all correlated with quality performance, and were essential to successful quality management:

- Corporate planning: effective strategic and business planning and deployment of plans, along with the focus on the requirements of customers, suppliers and other stakeholders.
- Role of top management leadership: personal involvement and leadership of senior executives in setting strategic directions and building and maintaining a leadership system are instrumental in facilitating high organizational performance, individual development, and organizational learning.
- Customer focus: an organization's effectiveness in recognizing its customer needs and expectations, disseminating this information throughout the organization, managing customer relations, and measuring and improving customer satisfaction are key to its long-term success.
- Human resource focus: this represents the consistency of an organization's human resource practices with its strategic directions. This is judged based on employee

training, involvement and empowerment practices of the organization and the effectiveness of its internal communication.

- **Process focus:** this deals with how an organization designs and introduces products and services, integrates production and delivery requirements and manages performance suppliers. This is judged based on the information on supplier quality management, process flow management, product/service design, and benchmarking.
- **Quality focus:** the effectiveness of an organization's quality department and the amount of quality efforts directed towards the development of plans as well as the improvement of products/services are considered in this construct.
- **Information and analysis:** this examines how the organization provides effective measurement systems for understanding and improving performance at all levels and in all parts of the organization. It also includes how the organization analyzes performance data and information to assess and understand overall organizational performance.

In summary, TQM is a holistic philosophy that aims to continuously improve every function of an organization to meet the needs of everyone associated with it (e.g. employees, customers and suppliers). While previous research has empirically examined the role of leadership and top management commitment, customer management, strategic planning and development, partnership and resources, people management and process management, little attention has been paid to the role of information management in building, driving and sustaining total quality. The present



research aims to investigate the role that enterprise-wide information management capability plays in the achievement of TQM.

### **Total Quality Management in the UAE**

In 1999, the United Arab Emirates (UAE) recognized the vital role that TQM plays in developing the economy. As a result, the Sheikh Khalifa Excellence Award (SKEA) was launched by the Abu Dhabi Chamber of Commerce and Industry (ADCCI) to improve the competitiveness of the business sector, in Abu Dhabi specifically, and the UAE in general. The SKEA was the first program in Abu Dhabi to adopt the EFQM Excellence Model (SKEA 2015). This initiative inspired other emirates to develop similar local awards. The SKEA became the primary national distributor and representative of the EFQM Excellence Model, and paved the way for the first Arabic version of the EFQM Excellence Model in 2013. The SKEA has three categories of award: diamond, gold and silver. These are awarded to organizations based on evidence of continuous improvement as compared with past performance. Applicants are drawn from every business sectors, such as manufacturing, services, trade, construction, financial services, tourism, other professions and health care. More than 10,000 organizations in the UAE use the SKEA model and hundreds of institutions participate in the annual assessment cycle with a select few receiving the award (SKEA 2015).

### **2.5 Knowledge Management**

Knowledge is recognized as a vital resource for sustaining a competitive advantage and improving performance (Gupta et al., 2000; Chang & Chuang, 2011; Ling et al., 2014). The very concept of knowledge is complicated. There is no single

definition, or consensus about what knowledge means. Beckman (1999) referred to knowledge as logic about information and data that supports problem solving, decision-making, learning and performance. In other words, “knowledge is derived from thinking, and it is a combination of information, experience and insight. Deriving knowledge from information requires human judgment, and is based on context and experience” (Anantatmula, 2004, p. iv). According to Gupta et al. (2000, p. 4), knowledge management is, “a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities such as problem solving, dynamic learning, strategic planning and decision-making”. For the purposes of the present research, a working definition of knowledge based on Gupta et al. (2000) will be used.

Knowledge is most commonly categorized as either tacit or explicit. Tacit knowledge is individual knowledge that occupies your mind, behavior and perceptions, such as skills, experiences and intuitions. This can be shared through stories, discussion and person-to-person interactions. That is why this kind of knowledge is difficult to capture, or represent, in an explicit form (Gartner, 2017). Explicit knowledge is the opposite of tacit knowledge. It is observable, simple, and easy to transfer, teachable, autonomous and codifiable. Explicit knowledge can take the form of documents, products, protocols, etc. (Gold et al., 2001).

Given the importance of knowledge in the effective and efficient functioning of organizations, knowledge management has become a central issue for management. Many definitions of knowledge management have been put forward. For instance, Gupta et al. (2000, p. 4) defined knowledge management as, “a process that helps organizations find, select, organize, disseminate, and transfer important information

and expertise necessary for activities such as problem solving, dynamic learning, strategic planning and decision-making”. García-Fernández (2015, p. 110) noted that knowledge management is, “the dynamic process whereby knowledge is created, stored, transferred, applied and used” Lakshman (2007, p. 55) stated that knowledge management was, “an organizational capability that allows people in organizations, working as individuals, or in teams, projects, or other such communities of interest, to create, capture, share, and leverage their collective knowledge to improve performance”. Casonato (2009, p. 3), meanwhile defined knowledge management as, “a discipline that formalizes the management of an enterprise’s intellectual assets. KM promotes an integrated approach to identifying, capturing, retrieving, sharing and evaluating an enterprise’s explicit and tacit knowledge assets”.

The literature recognizes KM as a significant tool for enhancing performance and increasing an organization’s competitive advantage (Ling et al., 2014). KM’s popularity is due to its impact on the organizational level, as it becomes important to exploit the knowledge management model to develop a competitive advantage (Stewart & Waddell, 2008). KM is often connected to innovation (Gloet & Terziovski, 2004), organizational performance (Tseng & Lee, 2014) and competitive advantage (Chuang, 2004). Chang and Chuang (2011) believe that knowledge management practices increase the use and sharing of knowledge and help to create a competitive advantage. Hlupic et al. (2002, p. 94) summarized the ultimate objective of knowledge management in the following sentence, “knowledge management is seen as the vehicle for organizational effectiveness and competitiveness”.

According to Gold et al. (2001), many organizations develop KM capabilities in order to achieve competitive sustainability. These researchers divide KM capability

into two main dimensions: knowledge infrastructure and KM processes. Knowledge infrastructure comprises the technology, structure, and culture, while the KM processes are made up of knowledge acquisition, conversion, application and protection. These processes are vital to effectively create a knowledge infrastructure.

For the purpose of the present research, I intend to rely on the definition of KM by García-Fernández (2015). This described KM as a dynamic process that creates, stores, transfers, applies and uses knowledge. In this context, it is also worth noting that dynamic processes need dynamic capabilities, such as an EIM capability to provide information or data (see Section 2.6). Table 5 summarizes these definitions (based on García-Fernández, 2015).

Table 5: The Dimensions and Sub-dimensions of the KM Processes

No	KM Dimension	Definition	Sub-dimensions
1	Knowledge Creation	Knowledge creation can be understood as a dynamic process consisting of collecting data and transforming it into information. This is then turned into knowledge, through the various levels of learning among the organization's members.	The acquisition of information, and the dissemination of information and shared interpretations.
2	Knowledge Transfer and Storage	The mechanism that stores the knowledge created and transfers it within a firm or between firms, after a knowledge creation process.	Storing knowledge and transferring knowledge.
3	Application and use of Knowledge	Exploiting and exploring resources, adapting to and changing the environment, learning and developing learning so that it can be transformed into new knowledge.	Teamwork, empowerment and commitment to knowledge.

The literature suggests a positive association between KM and TQM in which four KM processes (acquisition and creation, capture and storage, dissemination and transfer, and application) are said to facilitate TQM (Kongpichayanond, 2013). The positive contribution of KM processes to TQM is supported by Hung et al. (2010). Moreover, the analytical results in their study are consistent with those in other relevant literature and demonstrate how KM initiatives positively contribute to TQM (Zhao & Bryar, 2001; McAdam & Leonard, 2001).

Ju et al. (2006) found that KM contributed positively to TQM thanks to top management support, employee involvement, continuous improvement and a customer focus. Furthermore, Lim et al. (1999) mentioned that in the view of most TQM theorists, (e.g. Crosby, 1979; Deming, 1982), skill acquisition and development makes or breaks a successful quality strategy. These commentators also considered KM to be a quality strategy (since KM will provide knowable information to

employees, so that they can make decisions to promote a continuous and consistent improvement in quality). If KM is not used, they must sift out what is useful and what is not from a mass of irrelevant detail.

## **2.6 Enterprise Information Management Capability**

This section discusses the concept of enterprise information management capability (EIMC) and other concepts associated with it. In particular, it discusses the concepts of information capability, information management, enterprise information management and enterprise information management capability. It also discusses the relationship between EIMC and SCA, TQM and KM.

### **The Role of Information in Providing Competitive Advantage**

The importance of information in gaining a competitive advantage has been highlighted in the extant literature. Porter & Millar (1985) argued that the information revolution influences competition in several important ways. For example, competitive advantage is achieved by equipping organizations with new means to outstrip their competitors. Information flow can significantly improve an organization's ability to exploit links between valued activities, both within and outside the company. Thus organizations can coordinate their actions with their buyers and suppliers (Porter & Millar, 1985). Consequently, in an increasingly competitive business environment, organizations pursue information technology to help them to become reactive to environmental changes and their rivals' competitive actions (Pavlou & El Sawy, 2010). Moreover, Gunasekaran et al. (2011) claim that if a large company is to be competitive, it should develop core competencies by seeking alliances with other firms (suppliers) which have advanced systems of information technology and information

use. Baan (2012, p.62) states that, “If organizations can excel on the resource information front, they create a competitive advantage over their competitors. Such organizations are able to respond to changing customer needs and market movement. When an organization can respond or operate proactively, then information is used to its optimal value and power. Information is then a strategic business resource if used as such”.

IT scholars such as Glazer (1991) have noted the need to go beyond technology and consider information as an asset in itself for the sake of gaining a competitive advantage.

### **Information as a Capability**

Zárraga-Rodríguez and Alvarez (2013) reviewed definitions of the terms resources, competence, practices and capability. Based on their review I have illustrated the Capability Conceptual Model as shown in Figure 2, to further simplify the relationships between these terms. They define the firm’s information capability as the management’s distribution and efficient use of information. They also point out that the firm’s information capability comprises three main competencies, namely: competence in information technology, competence in information management and competence in informational behaviors and values. They go on to associate several practices with each of these three competencies. Table 6 below, illustrates these competencies in information capability and their associated practices. This is based on Zárraga-Rodríguez and Alvarez (2013).

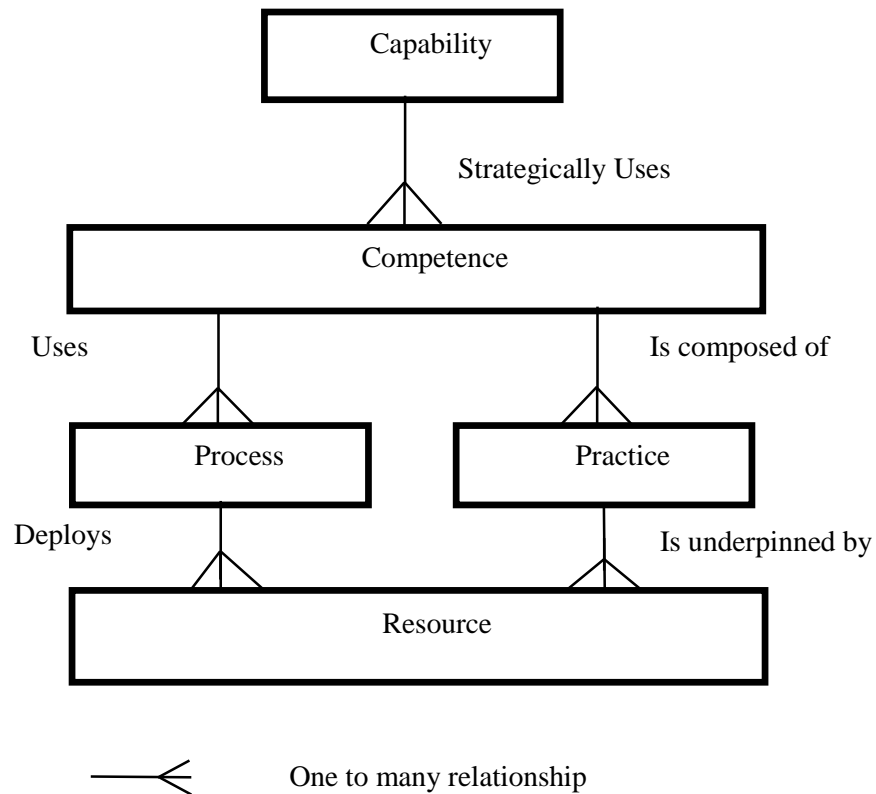


Figure 2: Conceptual Model of Capability

Table 6: Information Capability Competence and its Associated Practices

<b>Competences in Information Capability</b>		
<b>Information Technology Competence</b>	<b>Information Management Competence</b>	<b>Information Behaviors and Values Competence</b>
<b>Associated Practices</b>	<b>Associated Practices</b>	<b>Associated Practices</b>
Using IT for operational support	Information Sensing	Integrity
Using IT for business process support	Organizing	Formality
Using IT for innovation support	Maintaining	Control
Using IT for management support	Processing	Sharing
Using IT for strategy support	Dissemination	Transparency
Using IT for information sharing support	Collecting	Pro-activeness



Friedman et al. (2011) proposed a conceptual framework for information capabilities that offers insight into the common technical capabilities that are required for creating the best value from an organization's informational assets. They define information capability as a representation of the actions required for the information to be used, treated, organized or developed for the general management of an organization, and for specific purposes within it. They describe the common information capability categories as shown in Table 7 below.

Table 7: Categories of Information Capability

No	Category of Common Information Capabilities	Description
1	Describe	Collect knowledge about information assets: where they are, what format they are in, what level of quality they represent, and their potential value to the enterprise.
2	Organize	Align and structure information assets so that they can be readily found, easily consumed by other capabilities of the platform, and structured in a way that conforms to the organization's standards in regard to syntax (format), semantics (meaning) and terminology (use of common terms).
3	Integrate	Allow independently designed information structures to be leveraged together in the interests of a common objective.
4	Share	Make data available to consumption points.
5	Govern	Provide for control, levels of consistency, protection, quality assurance, risk assessment and compliance.
6	Implement	Provide the environment for building new capabilities and changing existing ones.

It is worth noting that, according to Friedman et al. (2011) the capabilities defined above do not consider the people and processes required for their implementation. Moreover, if it were to be used in a wider context, it should include the process, organization and governance dimensions as parts of the enterprise information management framework.

### **Information Management**

Due to the enormous amount of organizational information in today's digital age, managing information effectively has become a crucial aspect of an organization's success. Scholars such as Inkinen et al. (2015) highlight this fact by clarifying the ways in which organizations use IT in searching, gathering and analyzing information in order to enhance a firm's decision-making and performance. Moreover, several internationally recognized practitioners, and leading IT research and advisory firms share the view of these scholars. For example, the CIO of retailer Wal-Mart recognizes the critical role of information management (IM), the use of information and the way in which it is exploited and maximized as a strategic issue. It has been acknowledged that the speed of information is another issue over which businesses compete. The Wal-Mart CIO identifies the task of presenting and using information to drive the business forward and improve it (Mithas et al., 2011). Furthermore, Gartner, Inc. (a leading information technology research and advisory firm) has also pointed out that many organizations adopt innovative approaches and technology to address their business information requirements with regard to sales and marketing opportunities, and for ways to improve their operational and financial performance. Gartner's analysts have concluded that effective information management is vital to support digital business transformations and exploit a nexus of forces (Simoni & Walker,

2014). The nexus of forces is the convergence and mutual reinforcement of social, mobility, cloud and information patterns that drive new business scenarios (Laney et al., 2014). According to Howard et al. (2012), for years, technologists have discussed the ubiquity of information without realizing how to take full advantage of it. That time is here now. Social, mobile and cloud make information accessible, shareable and consumable by anyone, anywhere, at any time. Knowing how to capture the power of the ubiquity of information and utilize the smaller subsets applicable to the organization, products and your customers, at a specific point in time, will be critical to new opportunities and for avoiding risks. Developing a discipline of innovation through information enables organizations to respond to environmental, customer, employee or product changes as they occur. It will enable companies to leap ahead of their competition in operational or business performance.

Zárraga-Rodríguez and Alvarez (2013) consider the firm's information management to be a competence and not a capability. They define information management as the ability of a company to manage information effectively over the life cycle of the information's use. Newman and Logan (2006, p. 6) defined information management as, "a method of using technology to collect, process and condense information with the goal of efficient management". The technologies required include a set of modeling tools and a production-worthy repository in which to store and manage information. It is worth noting that the two definitions above have the same goal of the efficient management of information, but do not emphasize the usefulness of managing the information as an asset to the enterprise as a whole.

Other writers, such as Mithas et al. (2011), however, see information management as a capability. Mithas et al. (2011, p. 239) defined information

management capability as, “the ability to provide data and information to users with the appropriate levels of accuracy, timeliness, reliability, security, confidentiality, connectivity and access, and the ability to tailor these in response to changing business needs and directions”. Table 8 summarizes the main characteristics of an organization’s information management capability.

Table 8: Characteristics of Information Management Capability  
(Mithas et al., 2011)

<b>Information Management Capability Characteristics</b>
The ability to make needed data and information available.
The ability to make data and information accessible to employees, suppliers/partners, and customers, as appropriate.
The ability to ensure data and information integrity, reliability, accuracy, timeliness, security, and confidentiality.
The ability to keep data and information availability mechanisms in current touch with business needs and directions.
The ability to ensure that hardware and software are reliable and user friendly.
The ability to keep hardware and software systems in current touch with business needs and directions.

### **The Role of Information Management Capability in Providing Competitive Advantage**

Information management capability is evidenced in a company when it efficiently uses and manages information in a way that creates a competitive advantage. Thus information capability is mostly present in companies committed to quality management (Suárez et al., 2014). Zárraga-Rodríguez et al. (2014) consider a company to have information capability when the use and management of information is so efficient that it is a source of competitive advantage for the company. This capability can be decomposed into a number of concrete and observables practices,

which involve efficiently managing and using information. These practices are: information management capability, information technology capability, and information culture capability. Consequently, information management capability can be viewed as one of the organization's essential capabilities, which plays an important role in achieving and sustaining a competitive advantage.

### **Enterprise Information Management**

The practices associated with information management (IM) and enterprise information management (EIM) are quite different in many aspects. The main difference is that IM is practiced in silos (at project, application, data mart or even departmental levels), while EIM is practiced as an enterprise-wide integrative discipline. For example, among IM practices, whether structured or unstructured, repositories are managed with minimum attention to consistency, transparency or shareability within the enterprise as a whole (Newman & Logan, 2006). Even with the revolution in IM and information architecture, including such important functional components as data planning, modeling, standardization, synchronization, sharing, and the development of databases, enterprises are still not addressing today's challenges. They normally pay attention to structured data stored in relational databases and file systems, but do not give appropriate or proportional consideration to the unstructured and semi-structured contents stored in document management systems, emails, web content, XML, images and geospatial data. This shows the need to move from IM to enterprise IM (or EIM) where the meaning of the enterprise may vary according to the intended scope of integration. As a result, enterprise here can refer to a business unit, an entire corporation, or a collection of businesses joined together in a partnership (Newman & Logan, 2006).

In 2005, the concept of EIM was coined for the first time by the analyst firm Gartner. Since then Gartner's lead analyst, Debra Logan, has published many papers on the subject. In 2006, Forrester, another analyst firm, followed Gartner's lead and embraced EIM as a discipline to deliver business value. Academic literature has only recently started to investigate EIM, prompted by the exponential growth of information produced by organizations. These days renewed attention is being given to the effective management and protection of information as a key corporate asset (Hausmann et al., 2014).

Villar (2009, p. 24) listed the key components required for a successful EIM program. Table 9 illustrates these components.

Table 9: Components of the EIM Program

<b>EIM Program Component</b>	<b>Description</b>
Data Strategy	This presents the company's vision and goals for the data environment, and includes both the business and technical direction for the critical data of the company.
Enterprise Governance	This comprises the definitions, standards, policies and controls of the data.
Metrics	The measures against which the success of the EIM program will be judged.
Data Quality	Continuous measurement of the improvement of data quality dimensions, such as validity, completeness, timeliness and consistency.
Skills	Examples of these include hiring skilled IM employees, and training employees to equip them with the correct skill sets, both business and technical, to carry out the EIM initiatives.
Enterprise Data Service	Establishing a set of best practices, and common tools and methodologies that can be leveraged across the organization, such as metadata services, ad hoc reports and data marts.
Trusted Data Sources	Common data sources with the required level of quality, which needs be used across the organization, such as master data and enterprise data warehouse.
Common Data Sources with the Required Level of Quality	These need to be deployed across the entire organization. Examples are master data and the enterprise data warehouse

Newman and Logan (2006, p. 1) define enterprise information management (EIM) as, “an integrative discipline for structuring, describing and governing information assets, regardless of organizational and technological boundaries, to improve operational efficiency, promote transparency and enable business insight”. They point out that the scope of EIM requires organizational commitment to improving the accuracy, integrity, accessibility and security of informational assets. Hausmann et

al. (2014) refer to this definition and see EIM as an ongoing activity that covers every aspect of organizational information (whether integrated internally or externally) and contains many types of information system. They have argued that EIM needs to be sustained if it is to attain its ultimate goal.

Hausmann et al. (2014, p. 43) have described EIM as:

...seeking to break down information silos and to provide well-designed and usable information for employees. In summary, the key overarching concepts of EIM are: it is an enterprise-wide initiative, it addresses information across its entire life from creation to destruction and it seeks to derive value from information assets whilst ensuring that information is compliant - meeting information - related standards and laws.

Likewise Dravis (2008) views EIM as the set of activities that an organization undertakes, including policies, practices, processes and its supporting technology, to utilize information held in separate organizational information silos. While Ladley (2010, p. 9) defines EIM as a “Program that manages enterprise information asset to support the business and improve value. EIM manages the plans, policies, principles, frameworks, technologies, organizations, people, and processes in an enterprise toward the goal of maximizing the investment in data and content”.

Data management, data resources management, and enterprise information management are the various names given to the same important processes. They are all used for planning, specifying, enabling, creating, acquiring, maintaining, using, archiving, retrieving, controlling and purging data (Cupoli et al., 2014). Cupoli et al. (2014) argue that recognizing data as a valuable asset that should be managed effectively is progressively absorbing more and more attention from organizations that seek to be successful. According to Cupoli et al. (2013), data management is vital to every organization, and whether it is known as data management, data resources



management, or enterprise information management, it will comprise of the following areas: data governance, data architecture, data modeling and design, data storage and operations, data security, documents and contents, references and master data, data warehousing and business intelligence, metadata, and data quality. Similarly, Ladley (2009, p. 1) has noted that, “EIM treats data/ information as an asset, and EIM results in increased business success through coordinated (even choreographed) application of the many sub disciplines that make up EIM”. Villar (2009, p. 2) goes on to say that, “An EIM program is broad by its very nature. EIM is a collection of multiphase, multiyear initiatives where responsibilities, processes and technology help create change”. In conclusion, it is commonly held that the purpose of EIM is to use information assets to create value for any given organization, by making the analysis and manipulation of data possible, with the ultimate aim of helping the business achieve a competitive advantage (Ladley, 2009).

Lerche (2014) stated that data governance and data quality are significant factors contributing to the success of EIM. According to Dearstyne (2005), poor IM practices, or the immature exploitation of information assets, can decrease the quality of information. It is vital to organization to manage its information assets in a way it can be effectively utilized throughout its lifecycle (Lerche, 2014, p. 16).

For the purposes of this study, Newman and Logan’s (2006, p.1) definition of EIM will be used. They have defined EIM as, “an integrative discipline for structuring, describing and governing information assets, regardless of organizational and technological boundaries, to improve operational efficiency, promote transparency and enable business insight”.

## Enterprise Information Management Capability

Hausmann et al. (2014) described enterprise information management capability (EIMC) as a set of characteristics, measures or attributes that reflect the ability and commitment of an organization to manage all of its information assets. Table 10 illustrates characteristics of EIMC that can help to provide insights into the overall functioning of EIMC within an organization. This is based on Hausmann et al. (2014).

Table 10: Characteristics of EIMC

<b>Characteristics of Enterprise Information Management Capability</b>
Ability to meet regulatory requirements for compliance.
Ability to provide access to critical business information when it is needed.
Ability to achieve information governance.
Ability to integrate and share information externally with customers, suppliers, and business partners.
Ability to integrate and share information internally between departments.
Ability to create value from business information.
Ability to manage the cost of collecting, storing, and securing information throughout its lifecycle.
Ability to use information assets to provide business intelligence.

Lapkin (2011) proposed a broad EIM framework consisting of seven building blocks. The first three are the enterprise's vision, strategy and metrics. These first three building blocks are used to inform the direction of EIM initiatives. The other four building blocks represent EIM governance structures and they specifically deal with governance, the organization and role of information, the lifecycle and enabling infrastructure (i.e. technological infrastructure). According to this framework, each initiative in an EIM program should follow the seven building blocks' pattern in order

to succeed. These building blocks can be used at the level of EIM initiatives and can also be used at the level of the EIM program as a whole (when organizations seek to align and leverage their individual EIM investments). This framework is based on observations from Gartner, Inc. over a period of 10 years. End-user organizations with successful EIM programs report either making use of these building blocks or of an equivalent program structure. As these building blocks are vital for successful EIM programs, they will be considered in the present research as one essential dimension of the EIMC construct.

Typical initiatives in an EIM program are business intelligence (BI) and analytics, enterprise or corporate performance management, enterprise content management/web content management, e-discovery, record management, application integration/data integration, data warehousing, data lakes, big data analytics, open data, linked data and the consolidation/ migration of the application data.

According to White (2015), the most successful EIM programs start with one or more initiatives. Examples are enterprise information archiving (or e-discovery), business intelligence (BI) and enterprise content management. Recent examples have included master data management (MDM) and enterprise performance management, together with big data. Thus, EIM initiatives will be considered in this study as a second dimension of EIMC.

Lapkin (2011) recommended that EIM initiatives must extend their governance structure across various information domains and/ or types of data (for instance, social data, operational data, content, analytic data, master data, etc.) Each of these has its own set of applications, standards, practices and uses. Thus, in the present research, we will consider information domains as a third dimension of EIMC.

Based on the literature review, enterprise information management capability (EIMC) will be defined, for the purposes of this research, as the strategic application of EIM competencies in order to generate value and differentiation via the combined use of the previously mentioned EIM building blocks, relevant initiatives, and relevant information domains. It is worth noting that, consistent with the definition of EIM above, our EIMC definition reflects the ability and commitment of an organization to manage its information assets effectively in all aspects related to the various dimensions of EIM.

In summary, we can present EIMC as having three main dimensions: EIM building blocks, EIM initiatives and EIM domains. Table 11 summarizes these dimensions and gives typical examples of the components of each dimension.

Table 11: EIMC Dimensions and Typical Examples of their Components

<b>Enterprise Information Management Capability Dimensions</b>			
	<b>EIM Building Blocks</b>	<b>EIM Initiatives</b>	<b>Information Domains</b>
<b>Typical Examples of EIM Dimension Components</b>	Vision, Strategy, Metrics, Information Governance, Organization and Roles, Information Lifecycle, Enabling Infrastructure	BI and Analytics, Enterprise or Corporate Performance Management, Enterprise Content Management/ Web Content Management, Record Management, E-discovery, Application Integration/ Data Integration, Data Warehousing or Data Lake, Big Data Analytics, Open data or Linked Data, Application Consolidation/ Migration, Taxonomies, data mining	Content, Master Data, Analytic Data, Operational Data, Social Data, Unforeseeable Types of Data

In this research, I relied on the enterprise information management capability characteristics as defined by Hausmann et al. (2014) as the basis for measuring questionnaire variables. The rationale behind this is that the eight characteristics defined by Hausmann et al. (2014) already cover all the three main EIMC dimensions. Table 12 sets this out in more detail.

Table 12: EIMC Characteristics and the Relationships between the EIMC Dimensions

<b>EIMC Characteristics Based on Hausmann et al. (2014)</b>	<b>EIMC Dimensions Based on the Findings of the Present Research</b>
Meeting regulatory compliance requirements.	EIM building blocks (for example, information governance, metrics). EIM initiatives (e-discovery, enterprise or corporate performance).
Providing access to critical business information when it is needed.	EIM initiatives (for example, BI and analytics, enterprise content management web content management, record management, e-discovery, organization and roles).
Achieving information governance.	EIM building blocks (for example, Information governance).
Integrating and sharing information externally with customers, suppliers, and business partners.	EIM initiatives (for example, open data or linked data, web content management, application, application integration/data integration, data warehousing) Information domains (for example, social data)
Integrating and sharing information internally between departments.	EIM initiatives (for example, enterprise content management, web content management, record management, application integration/data integration, data warehousing)
Creating value from business information.	EIM building blocks (for example, vision, strategy, metrics, information governance). EIM initiatives (for example, BI and analytics).
Managing the cost of collecting, storing, and securing information throughout its lifecycle.	EIM building blocks (for example, the information life cycle).
Using information assets to provide business intelligence.	EIM initiative (for example, BI and analytics). Information domains (for example, master data, analytical data, and operational data).

## **Enterprise Information Management Capability and Sustainable Competitive Advantage**

The literature suggests that EIMC has a positive role to play in enhancing organizational performance. White and Logan (2014, p. 3) believe that, “EIM discipline supports every aspect of the business and IT landscape that uses information, spanning data warehousing, business intelligence, business applications, application development, and business to business, among others”. Zhou et al. (2008) support the view that EIM improves the time-related operating performance of an organization. For example, with EIM operationalized, timely information about materials and parts can be delivered to the manufacturing area directly, instead of being transferred from the supplier to the warehouse, and then from the warehouse to the manufacturer. In addition, Zhou et al. (2008) have shown that EIM has a positive, and statistically significant, direct effect on business performance. Moreover, Kichuk and Woledge (2006) argue that a proper approach to EIM contributes to better individual and organizational performance, empower the standardization of business intelligence, and secures the prompt delivery of significant information to business users in an understandable way. It also empowers both business and IT support to be both adaptable and agile.

In addition, Ladley (2009) noted the negative impact of inadequate use of EIM. This includes the high cost of information ownership caused by duplication, high risk factors due to a lack of knowledge concerning where sensitive information is held, and the inability of users to effectively leverage organizational knowledge and manage critical business information appropriately. He also listed the positive impact of EIM. This includes understanding the cost of managing information, valuing information as an asset, achieving a holistic picture of risk, and making progress with compliance

with legislation and regulations. Mithas et al. (2011) have also argued that information and analysis (one of the dimensions of EIMC) serves as a nerve center for performance excellence. They note that information management capability is a foundational capability, which enhances other organizational abilities and thus affects performance. Bischoff (2015) supports this argument.

Lee (2002) investigated four winners of various quality awards to identify commonalities in their practices that have resulted in them achieving and sustaining business excellence. He identified several EIM initiatives (one of the EIMC dimensions), such as a system of management information, a decision support system and data mining as among common best practices used by outstanding organizations. Park (2006) also provides empirical support for the opinion that a full data warehouse (another EIM initiatives) provides decision makers with a reliable source of consistent data and this results in improved performance.

### **Enterprise Information Management Capability and Total Quality Management**

Zárraga-Rodríguez and Alvarez (2013) considered TQM to be an information-intensive management system. When it is implemented, the information system will facilitate the monitoring of information. In addition, Fok et al. (2001) found it reasonable to expect that, in order to implement a quality management system successfully, organizations should have in place an appropriate infrastructure and an effective information system. Moreover, Hietschold et al. (2014) considered information/ analysis/ data as a critical factor in TQM success as it is vital for effective management. The implementation of TQM is impossible without a properly functioning information system. Mosadeghrad (2014), however, refers us to several studies that have reported on a negative relationship between the lack of a good

information system and the information required for quality improvement and successful TQM.

### **Enterprise Information Management Capability and Knowledge Management**

The literature highlights the value of information valuation as part of a knowledge-based economy. Marr (2017) argues that we are now involved in tying economic significance to information, and that measuring, managing, and monetizing information is complex. As a result, information should be considered an asset and should, for strategic reasons, be quantified and administered just like any other asset.

Information technology systems are essential to support and enhance the organizational processes of knowledge creation, storage, retrieval, transfer and application (Chuang et al., 2013; Alavi & Leidner, 2001; Gold et al., 2001; Gupta et al., 2000; Jackson, 1999). In particular, an information system can be used to support and promote knowledge management processes (Chang & Chuang, 2011). Jackson (1999) considered information technologies to be facilitators of an organization's KM, and lists such technologies as databases, document management systems, search engines, decision support systems and a data warehouse. Alavi and Leidner (2001) maintain that IT which is used in information searches and discovery and the establishing of efficient links between an organization and its internal and external stakeholders, is a vital tool for modern knowledge workers.

EIMC initiatives such as data and text mining, use of the intranet and extranet, and taxonomies are considered as prerequisites for knowledge processes in the UK construction industry (Ruikar et al., 2007). According to Woods (2004), taxonomies can help to improve the efficient integration of applications, website design and knowledge management initiatives. They can also assist in the improvement of the



quality of information as they facilitate easier navigation and better sharing of information. Taxonomies are seen as tools to assist with the structuring of information and provide solutions for organizations in their quest for the most relevant information and for it to be identified in the shortest possible time and in a consistent and reliable manner.

In conclusion, EIMC focuses on breaking down silos of information, increasing transparency, and on leveraging the value of any stored digital information. If adequate EIMC is not in place, KM will not be as effective as it could be. Ideally, KM and EIMC should be handled together in a synergetic manner.

## **2.7 Chapter Summary**

A review of the literature on strategic management, information management and knowledge management makes it clear that achieving and sustaining a competitive advantage can be reached via several different approaches. These include knowledge management, total quality management and enterprise information management. On the other hand, it is clear that there is a lack of understanding of exactly how enterprise information management capability can specifically contribute to gaining a sustainable competitive advantage. Previous research has only implied this relationship. Thus, it has become increasingly challenging for organizational decision makers to effectively engineer a sustainable competitive advantage.

This research aims to complement the existing literature by investigating the relationship between EIMC and SCA. I will also consider the mediating effects that TQM and/or KM plays in this relationship. In order to understand in greater depth the direct and indirect impact of EIMC on SCA, this study is grounded in dynamic

capability theory, which will be described in the following chapter dealing with the theoretical framework.

## **Chapter 3: Theoretical Framework and Hypotheses Development**

### **3.1 Introduction**

This chapter describes the theoretical framework that informs the study. In particular, the chapter draws on dynamic capability as the theoretical basis through which I will analyze enterprise information management capability (EIMC) and develop a conceptual model that links EIMC to KM, TQM and SCA. I have drawn on the existing literature to argue for the relationships that are implied by the conceptual model. This model also allowed for the development of nine testable hypotheses.

### **3.2 Theorizing Enterprise Information Management Capability as a Dynamic Capability**

Most IT and IS literature draws on a resource-based view (RBV) and the theory of dynamic capability (DC). In strategic management, RBV theory explains performance by focusing on internal, firm-specific resources and capabilities. This ‘inside-out’ perspective explains a firm’s competitive advantage by analyzing its distinctive combination of rare resources, which are inimitable to competitors and valuable for the specific purpose of the firm (Knecht, 2013). Barney (2001) viewed resources as a bundle of tangible and intangible assets that a firm possesses. Furthermore, he used ‘resources’ to mean all the assets, capabilities, organizational processes, attributes, information, knowledge, etc. that an organization can exploit to equip itself with strategies to improve its efficiency and effectiveness. Moreover, in Barney’s (2001) view, not all resources have the potential to produce a sustained competitive advantage. To have this potential, a resource must be capable of being described as follows. It must be:

- **Valuable:** i.e. When a resource enables a firm to conceive, or implement strategies, that improve its efficiency and effectiveness, in the sense that it exploits opportunities and/ or neutralizes threats in the firm's environment.
- **Rare:** i.e. When it is rare among the firm's current and potential competition.
- **Imperfectly Imitable:** Rare and valuable resources can be sources of sustainable competitive advantage only if competing firms cannot duplicate them. They attain this state because of one, two or three of the following factors: the ability of a firm to obtain a resource is dependent upon unique historical conditions; the link between the resources possessed by the firm and the firm's sustained competitive advantage is causally ambiguous; the resources generating a firm's advantage are socially complex.
- **Imperfect Substitutability:** i.e. When there can be no strategic equivalents or substitutes for this resource that are valuable but either rare or imitable.

Researchers such as Teece et al. (1997) and Eisenhardt and Martin (2000) have criticized the resource-based view (RBV) for its static nature and its inability to explain the organization's sustainable competitive advantage, even though it can explain the organization's current competitive advantage. The current dynamic business environment has created a need to extend and improve the RBV theory to overcome its various limitations. The concept of dynamic capability was developed for just that purpose.

Teece et al. (1997) defined dynamic capability as the ability required to address a turbulent environment by integrating, building and reconfiguring internal and external competencies. According to Eisenhardt and Martin (2000), a firm's processes

need to dynamically integrate, configure, gain and release resources to fit with, or initiate, the market change and that all comprises the dynamic capabilities of the firm. Thus, dynamic capabilities are organizational and strategic routines that aid organizations to reach new configurations of their resources in a dynamic market. Moreover, Teece (2007, p. 1341) defines dynamic capabilities as, “the foundation of enterprise level competitive advantage in regimes of rapid technological change”. He also claimed that dynamic capabilities “enable business enterprises to create, deploy, and protect the intangible assets that support superior long-run business performance” (Teece, 2007, p. 1319). Teece (2007) further emphasized the value of dynamic capabilities to any given organization’s competitive advantage, especially in times of rapid technological change, due to the ability to highlight organizational and (strategic) managerial competencies that assist an enterprise to achieve and maintain a competitive advantage.

Similarly, Metaxas and Koulouriotis (2014) argue that to sustain success, dynamic capabilities should be created to make it possible to continuously develop innovative products and services. Leonard-Barton (1995, p. 4), for his part, claimed that progressively developed core capabilities (which are challenging to duplicate) constitute a firm’s competitive advantage. Teece et al. (1997) also claimed that the global market winners are the firms that react quickly, produce rapid and flexible innovations, and have sufficient management capability to effectively organize and reuse internal and external competencies. If a firm possess resources/ competencies alone and lacked dynamic capability, it might make a competitive return and, for a short period, even a supra-competitive return, but to sustain a supra-competitive return organizations would need considerable good fortune.

A turbulent market and high turnover rate of resources shorten the expected life cycle of a firm's competitive advantage (He, 2012). According to Metaxas and Koulouriotis (2014), what is successful today may not be so tomorrow. Organizations should thus develop dynamic capabilities that enable them to develop constantly innovative products and services. This is one of the reasons that has motivated researchers to continuously revisit the topic of sustainable competitive advantage (Lee et al., 2014; Meers & Samson, 2003; Lee, 2002; Brown, 2013b).

Given the nature of the current dynamic business environment, and in line with the main research questions and objective of this research (see Chapter 1, above), I have relied on the theory of dynamic capabilities to provide a theoretical foundation for this research.

Dynamic capabilities theory offers an opportunity to examine and explore the impact of EIMC on an organization's sustainable competitive advantage (SCA), as well as other relationships between EIMC, KM, TQM and SCA. Previous studies of IT business values have relied on dynamic capability theory as a basis for their theoretical and empirical research (Lim et al., 2011). For example, Olszak (2014) proposed a model of business intelligence and analytics (embedded in EIMC) as a dynamic capability and showed that six areas of business intelligence and analytic capabilities (governance, culture, technology, people, processes, and change and creativity) ought to be simultaneously developed in order to integrate, build and reconfigure informational resources and business processes that can address rapidly changing business environments. Battleson et al. (2016) examined how IT capabilities such as cloud computing (embedded in EIMC) could accelerate the ability of an organization to achieve dynamic capabilities.

Theoretically, I conceptualize EIMC as a dynamic capability which is made up of information management processes that dynamically integrate, configure, gain and release resources to fit in with, or initiate, market change in order to support superior long-term business performance.

With regard to the integration of information, Newman and Logan (2006) considered enterprise information management to foster improvement in operational efficiency, promotes transparency and encourages new business insights. Hausmann et al. (2014) also see EIM as an ongoing activity that integrates organizational information both internally and externally. For example, a data warehouse (embedded in EIMC) is considered as a tool that greatly reduces the time between the occurrence of a business event and the construction of an effective tool for summarizing important data for decision makers. This in turn increases the chance to seize the opportunity in a timely manner. Moreover, a data warehouse makes it easier to integrate data across various units in an organization and with external entities, such as customers and suppliers (Zeng et al., 2003).

According to Olszak (2014), business intelligence and analytics (embedded in EIMC) are dynamic capabilities which, when they are developed, integrate, build, and reconfigure the firms' information resources, and its business processes to address the rapidly changing business environment. Taxonomies, which are part of an enterprise's content management (embedded in EIMC) are tools that help people to structure information (Woods, 2004). Building on these findings, I will argue that EIMC provides, beside integration, the capability to gain and reconfigure information.

In terms of releasing resources, EIMC initiatives are thought to make it possible to share, manage and reuse disparate items of information from different databases and

repositories (Lapkin, 2011). Enterprise information management uses advanced information technology to collect, spread and use information (Xin et al., 2015). Information discovery (embedded in EIMC) establishes efficient links between an organization and its internal and external stakeholders (Alavi & Leidner, 2001). Park (2006) noted that a full data warehouse (embedded in EIMC) provides decision makers with a source of reliable and consistent data. Therefore, building on these findings and looking through the lens of dynamic capability theory, it can be argued that EIMC is a dynamic capability that provides organizations with the capacity to integrate, build and configure their information assets.

### **3.3 Research Model**

It follows, then, that enterprise information management capability is a dynamic capability, which may have an impact on sustainable competitive advantage. I will argue that EIMC has a direct relationship with SCA and that the relationship between EIMC and SCA is mediated by both KM and TQM, and serially mediated by both KM and TQM. The proposed relationships between these constructs are represented in the theoretical model depicted below (see Figure 3).



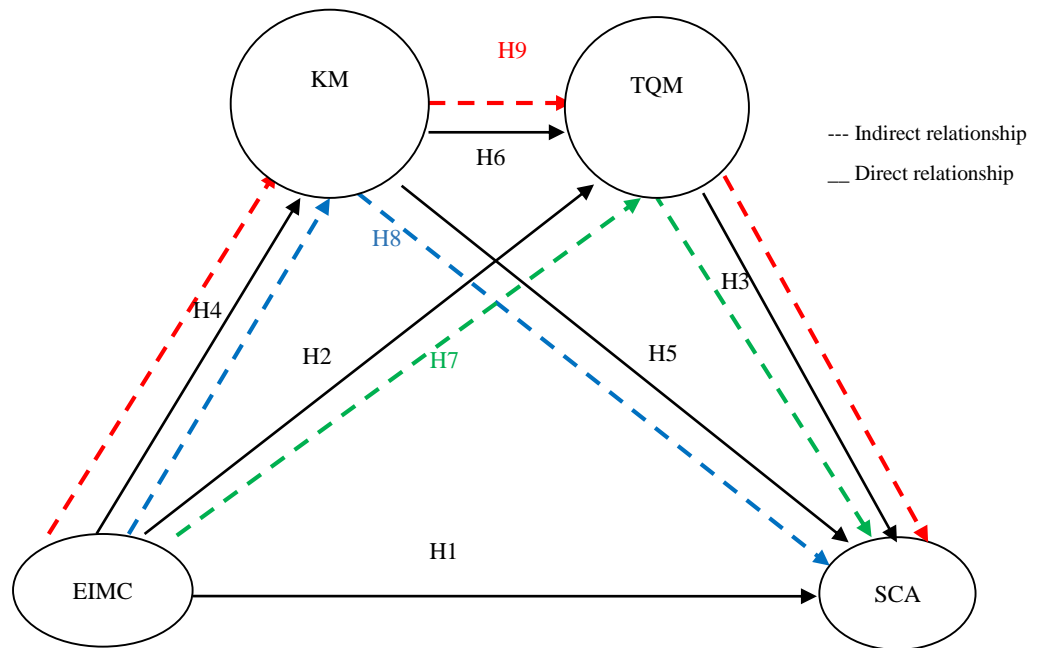


Figure 3: Conceptual Model of Relationships

### 3.4 Hypotheses Development

This section develops the hypotheses implied from the theoretical model above. The hypotheses are divided into two main groups: those about direct relationships and those about mediated relationships.

#### 3.4.1 Direct Relationships

In this section I focus on deriving hypotheses about the direct relationships implied by the model. Six hypotheses will be proposed.

##### 3.4.1.1 The Relationship between Enterprise Information Management Capability and Sustainable Competitive Advantage

Barney (1991) argued that, to sustain a competitive advantage, an organization needs to implement strategies that use its internal strengths fully by responding to environmental opportunities, defusing external threats, and preventing internal weaknesses. To continue this argument, he contends that a sustained competitive

advantage is evident in a firm that implements a value creation strategy that has not been implemented by its competitors, and is very challenging to duplicate. I will argue here that EIMC generates such antecedents and hence contributes to SCA. I can justify this view by making the following points:

Firstly, according to Villar (2009), the overall outcome of EIM (outcome of EIM) produces several benefits, such as giving customers a better insight into internal operations. It is worth mentioning that Hausmann et al. (2014) considered integrating and sharing information externally – with customers, suppliers, and business partners– to be one of the main advantages of EIMC. For example, EIMC initiatives such as data warehousing and business intelligence aim to integrate and share information internally and externally to support decision making and improve business performance. Such factors contribute greatly to planning the organization’s future needs and avoidance of threats, and thus assist decision-makers, when they are debating more innovative procedures. This leads to the inference that EIMC assists organizations to become more agile (with fewer internal weaknesses) and reactive to environmental change (opportunities or threats) and consequently to develop a competitive advantage.

Secondly, according to Xin et al. (2015), intense competition pushes enterprises to continuously develop through the prompt and accurate collection, development and use of information. This, in turn, enhances the competitiveness of the enterprise. EIMC aids all these activities. According to Hausmann et al. (2014), managing the cost of collecting, storing and securing information throughout its lifecycle and using information assets to provide business intelligence are two main aspects of EIMC. This is evident when we consider initiatives, such as the data warehousing (embedded

in EIMC). This can result in a standardization of information, greater accuracy, and more consistency. In turn, this leads to quicker and more reliable decision-making, which results in better performance (Park, 2006; Lee, 2002).

Third, (as previously pointed out in section 2.3 above), an organization can gain a sustainable competitive advantage when it is capable of developing internal foundations and processes and thereby creates suitable competencies to adjust to changing customer and strategic needs (Ulrich and Lake, 1990). In order to remain competitive, firms always need to adjust their operational strategies, adopt new technology before their competitors, and be resilient when meeting the changing needs of the global market (Gunasekaran et al. 2011). According to Ulrich and Lake (1990), sustainable competitive advantage enables businesses to adjust to the constantly varying demands of strategic and customer demands. EIMC provides organizations with information about their constantly changing internal and external environment in ways that allow the organizations to strategically adjust their processes and products to meet the demands of an increasingly competitive market. Therefore, EIMC has the ability to provide organizations with access to critical business information and the ability to integrate and share information internally and externally. Furthermore, If I rely on Eisenhardt & Martin (2000) definition of dynamic capabilities and many commentators in the field of EIM I maintain that EIMC is a process that uses resources (i.e. enterprise information assets) to match, or even create, market change. This supports my argument that the capabilities of EIMC can lead to a sustainable competitive advantage. The main aim of EIMC is to break down silos of information and supply the information to the right person at the right time (for example, from the supplier to the customer). EIMC initiatives such as an enterprise's data warehouse (EDW) and an enterprise's content management (ECM), enable organizations to

respond to changing customer demands and market turbulence in order to create or maintain a sustainable competitive advantage. My argument is also in line with findings of Baan (2012) discussed earlier (see section 2.6).

Additionally, superior performance is a dimension of SCA. Thus, enhancing a firm's performance attains SCA. Therefore, improving performance and creating business value from enterprise information contributes significantly to SCA. The directly positive effect of EIM on business performance was discussed by Zhou et al. (2008). They argued that EIM improves an organizations' time-related operating performance in terms of passing on timely information about the availability of materials and parts. For example, they can be delivered to the manufacturing area directly, instead of having to be transferred from supplier to warehouse, and then from warehouse to manufacturer (Zhou et al., 2008). Kichuk and Wooledge (2006) stated that the correct deployment of EIM drives individual and organizational performance, by strengthening a business's agility and adaptability. EIMC initiatives such as establishing a data warehouse, business intelligence, and other aspects, supports every aspect of a business (White & Logan, 2014).

Finally, information management capability plays an important role in developing other capabilities, such as customer management, process management, and performance management capabilities. In turn, these capabilities favorably influence the following measures of firm performance: customer-related effectiveness, financial effectiveness, human resources, and organizational effectiveness (Mithas et al., 2011). Based on these observations, I will argue that enterprise information management capability has a positive impact on achieving a sustainable competitive advantage. Therefore, the first hypothesis (H1) is as follows:

**Hypothesis 1:**

Enterprise information management capability has a direct positive relationship with sustainable competitive advantage.

**3.4.1.2 The Relationship between Enterprise Information Management Capability and Total Quality Management**

Total quality models such as the Baldrige and EFQM Excellence models recognize the vital role that data, information and knowledge play in a firm's success (Cragg, 2005). Scholars such as Nasseef (2010, p. 239) have reasoned that, "data and information are the lifeblood of any organization". He concluded that information management was an important part of the success of TQM. In addition, Fok et al. (2001) found it reasonable to expect that, in order to implement a quality management system successfully, organizations needed an appropriate infrastructure and an effective information system (IS). Moreover, Hietschold et al. (2014) considered information/ analysis/ data to be critical factors in the success of TQM. It is impossible to implement TQM when a firm's IS functions is inadequate. Moreover, TQM is an information-intensive management system; while information management capability can be expected to be at the forefront of TQM practices (Zárraga-Rodríguez & Álvarez, 2013). Mosadeghrad (2014) refers to several studies that reported the negative relationship between an inadequate information system and the information that is required for quality improvement and the success of TQM. Information-based management is thus acknowledged as a critical success factor for TQM (Calvo-Mora et al., 2015). Information and analysis is recognized by vast literature as a TQM implementation SCF. It is recognized when organization equipped with effective measurement systems that improve overall organization performance. Organization

able to analyze performance data and information are more effective at assessing and understanding overall organizational performance.

Integration, configuration, gaining, and releasing information, all combine as necessary functions for information-based management and are provided by EIMC. EIMC initiatives such as enterprise content management, data warehousing, business intelligence, data governance and the application of integration/data integration play an essential role in integrating and releasing information externally to customers, suppliers and business partners, as well as internally to employees. Nasseef (2010) recognized the management of customers, suppliers, and developing partnerships as factors crucial to the success of TQM. It is therefore possible to infer that EIMC, through its capacity to integrate, plays a vital role in developing TQM. For instance, in terms of human resources, finances, customer management, partnership/ supplier development, strategic quality planning, communication, and process management. As such, it can be expected that EIMC will be positively associated with TQM. Therefore, the second hypothesis (H2) is as follows:

**Hypothesis 2:**

Enterprise information management capability has a direct positive relationship with total quality management.

**3.4.1.3 The Relationship between Total Quality Management and Sustainable Competitive Advantage**

The literature links the implementation of TQM to achieving a competitive advantage (Suárez et al., 2014; Ionică et al., 2010; Brah et al., 2002). It considers TQM as a crucial element for gaining and sustaining a competitive advantage (Nasseef, 2010). According to Ho (1999, p. 88), TQM is “a holistic effort that leads to

competitive advantage by means of developing every facet of an organization's activities".

Referring to Barney (1991) earlier argument regarding the prerequisites of the sustainable competitive advantage, organizations should implement strategies that use its internal strengths fully to respond to the environmental opportunities, defuse external threats, and prevent internal weaknesses. TQM can assist organizations to meet their strategic and financial goals and achieve excellent results through improved factors such as leadership and commitment to quality on the part of top management, strategic planning, continuous improvement, building a customer focus, management based on information, human resource management, process control, and supplier management (Suárez et al., 2014). Firms implementing TQM perform better than others (Brah et al., 2002). Implementing TQM results in several tangible and intangible benefits, which can enhance an organization's competitive position. For example, better quality of production, faster organizational learning, the promotion of continuous improvement, increasing the firm's flexibility and enhancing its responsiveness (Youssef, 1996, p. 132). According to Mosadeghrad (2014), the successful implementation of TQM leads to business success, which becomes apparent in fewer errors and less waste, better sales, greater productivity, higher profits, more market share, better customer satisfaction (internal and external) and closer relationships with stakeholders (Ionică et al., 2010; Seetharaman et al., 2006; Idris & Zairi, 2006). Therefore, it becomes possible to propose a third hypothesis (H3):

**Hypothesis 3:**

Total quality management will have a direct positive relationship with sustainable competitive advantage.

#### **3.4.1.4 The Relationship between Enterprise Information Management Capability and Knowledge Management**

Knowledge management processes, such as knowledge creation, storage/retrieval, transfer, and application require the support of IT systems (Chuang et al., 2013; Alavi & Leidner, 2001; Gold et al., 2001; Gupta et al., 2000; Jackson, 1999). For example, integrating information insures information accuracy and consistency. Sharing accurate and consistent information among the knowledge workers improves their knowledge and provides them with more realistic insight on current activities and processes and in turn they can better apply their knowledge to improve their individual, team and organization performance. Configuring, gaining and releasing information results in providing new valuable information and secures it. These processes are vital to create, store, transfer, apply and use knowledge.

EIMC initiatives (embedded in EIMC) such as databases, document management systems, search engines, decision support systems, and data warehouses are information technology systems that facilitate knowledge management in an organization. To be more specific, document management supports knowledge gathering, while a data warehouse and databases support knowledge storage. Expert systems can provide an intelligent analysis of information, online processing and filtering which in turn support knowledge capturing and knowledge application.

Information technologies/ systems that are used for information searches and discovery, and for establishing efficient links between an organization and its internal and external stakeholders, are recognized as a vital tool for modern knowledge workers (Alavi & Leidner, 2001). A data warehouse and data mining, as well as other forms of data integration and data analysis techniques, are embedded in EIMC and make it



possible to store, create and transfer, use and apply knowledge. All of this is part of the knowledge management process. Therefore, we can argue that EIMC is a vital ingredient in efficient knowledge management. Ideally, KM and EIMC should be implemented together. As such hypothesis four (H5) is as follows:

**Hypothesis 4:**

Enterprise information Management has a direct positive relationship with knowledge management.

**3.4.1.5 The Relationship between Knowledge Management and Sustainable Competitive Advantage**

Knowledge is considered to be a critical factor for gaining a sustainable competitive advantage and for organizational performance (Anantatmula, 2004). The literature argues that organizations need to harness knowledge in order to stay competitive (Gupta et al., 2000; Ling et al., 2014). Chang and Chuang (2011) believe that competitive advantage is enhanced through knowledge management practices such as the use of and sharing of knowledge.

To sustain competitive advantage organization's personnel should be able to generate core competencies that allow business to adjust to changing strategic and customer demands (Ulrich and Lake, 1990). This bring the attention to the value of knowledge to the business through acquiring, sharing and exploiting it by the workers, managers and employees. This helps an organization to produce decisions that meet the altering strategic and market demands through reducing costs, minimizing risks, and increasing profits. These effects result in improving the organization's overall performance and providing the organization with a competitive advantage (or enhancing and sustaining an existing competitive advantages). Gold et al. (2001)

suggested that exploiting current knowledge and creating new knowledge are essential for organizations that aim to position themselves favorably against rivals and compete effectively. To be more specific, organizations need to exploit existing knowledge about the market and customers' dynamic demands before their competitors, and create new knowledge about how they can provide what is required before their competitors. Doing so provides an organization with a competitive advantage over their competitors. In brief, knowledge management processes provide decision makers with the required information that enables them to come up with more cost effective and differentiated strategies, which are the prerequisites to establishing a sustainable competitive advantage. In light of these observations, the fifth hypothesis (H5) is given below:

**Hypothesis 5:**

Knowledge management will have a direct positive relationship with sustainable competitive advantage.

**3.4.1.6 The Relationship between Knowledge Management and Total Quality Management**

Previous research suggested a relationship between TQM and KM (Hsu & Shen, 2005; McAdam & Leonard, 2001; Molina et al., 2004). Four KM processes (acquisition and creation; capture and storage; dissemination and transfer; and application) are recognized as facilitators of TQM (Kongpichayanond, 2013).

Literature recognize Corporate planning and Customer focus, as TQM implementation success factors. Corporate planning is recognized by effective strategic and business planning, which focused on the requirement of customers, suppliers and stakeholders. Knowledge creating and transferring is prerequisites to

vital organization activities such as strategic and business planning, one of TQM implementation critical success factor. Customer focus can be achieved through effective recognizing the customer needs and expectations. Creating and transferring knowledge regarding customers' needs and expectation leads organization to meet that.

Attention is brought to knowledge management because product/ service depends significantly upon it (Srdoc et al., 2005). Knowledge management processes sustain the close relationship between organization and customer, in turn enable companies to maintain quality and meet future customer satisfaction with regard quality (Lee et al., 2001). Existing research has demonstrated that KM initiatives significantly and positively contribute to TQM (Zhao & Bryar, 2001; McAdam & Leonard, 2001; Hung et al., 2010).

Ju et al. (2006) have contended that KM contributes positively to TQM through top management support, employee involvement, continuous improvement and a customer focus. For example, organizations that collect knowledge from customers about their needs, in order to generate know-how for themselves about suitable services and products are increasing their focus on customer need. This enables them to improve the quality of their services and products according to customer demands. Secondly, this affects their continuous improvement in a positive way. As above, a customer focus and continuous improvement are success factor for TQM. Knowledge management practices such as knowledge creation and sharing are also required to provide employees and managers with insights about the performance of the organization's internal business processes and the quality of their products and services. They should also be aware of any potential opportunities to enhance this

performance. Based on this insight, the organization's internal business processes, services and products can be improved and these are critical factors in achieving successful TQM.

Furthermore, Lim et al. (1999) noted that most TQM theorists (e.g. Crosby, 1979; Deming, 1982) believed that skill acquisition and development will make or break a quality strategy. These commentators also considered KM to be an excellent quality control strategy (since KM provides 'knowledgeable information' to employees in order for them to make decisions that will promote a continuous and consistent improvement in quality, rather than asking them to sift through irrelevant information). They have proposed that TQM frameworks, such as Deming's, captures KM processes at all four steps of its lifecycle (planning, doing, checking and acting), as suggested by Hsu and Shen (2005). Based on these observations, I can propose the sixth hypothesis (H6):

**Hypothesis 6:**

Knowledge management has a direct positive relationship with total quality management.

**3.4.2 Mediated Relationships**

Following from this, it might be expected that the relationships between enterprise information management capability and sustainable competitive advantage will be mediated by total quality management and knowledge management, and serially mediated by both knowledge management and total quality management. To determine mediation, it is important to examine both the direct and indirect

relationships. Now that the direct relationships have been hypothesized above, the focus in this section is on hypotheses concerning indirect relationships.

#### **3.4.2.1 The Indirect Relationships between Enterprise Information Management Capability and Sustainable Competitive Advantage through Total Quality Management**

On the basis of the argument underlying Hypothesis Two (H2), that enterprise information management capability will have a direct positive relationship with total quality management, a view supported by the literature (Mithas et al., 2011; Zárraga-Rodríguez and Alvarez, 2013; Hietschold et al., 2014). Also on the basis of the argument underpinning Hypothesis Three (H3), that total quality management will have a direct positive relationship with a sustainable competitive advantage (see Nasseef, 2010; Young Kim et al., 2010; Santos-Vijande & Álvarez-González, 2009; Abdullah et al., 2008; Idris & Zairi, 2006; Lee, 2002), it is possible to predict that in addition to the direct positive impact of EIMC on SCA, EIMC also flows through TQM and indirectly impacts on the firm's SCA. To better understand this indirect effect, let us consider the potential effect of information and analytics on product (or service) quality. According to Hietschold et al. (2014), information and analytics have positive empirical effects on product quality (among other TQM performance indicators such as operational and financial performance, customer service and satisfaction). Product (or service) quality creates not only a price/value advantage over competitors, but also enables the firm to charge a higher per unit price. Therefore, a high quality strategy leads to a sustainable competitive advantage (Nasseef, 2010). Having said that, it is possible to predict that enterprise information management capability is indirectly associated with a sustainable competitive advantage due to its effect on total quality management. However, I will suggest a seventh hypothesis:

**Hypothesis 7:**

The relationship between enterprise information management capability and sustainable competitive advantage is mediated by total quality management.

**3.4.2.2 The indirect Relationships between Enterprise Information Management Capability and Sustainable Competitive Advantage through Knowledge Management**

The argument underlying Hypothesis Four (H4), that enterprise information management capability will have a direct positive relationship with knowledge management is a view supported in the literature (Chang & Chuang, 2011; Ruikar et al., 2007). Also my argument in Hypothesis Five (H5) that knowledge management will have a direct positive relationship with sustainable competitive advantage, is likewise supported by the literature (Ling et al., 2014; Chang & Chuang, 2011; Tseng & Lee, 2014). Therefore, it is possible to predict that in addition to the direct positive impact of EIMC on SCA, EIMC also flows through KM and indirectly impacts the firm's SCA once again. To better explain this indirect effect, let us consider the potential effect of business intelligence technology on SCA. Business intelligence technologies are information technology systems (embedded in EIMC) that enable a firm to generate knowledge about its competition and the broader economic environment (Chang & Chuang, 2011). As a result, EIMC supports the firm in generating, storing, sharing and using this knowledge in order to gain a competitive advantage over its competitors. That said, it can be predicted that enterprise information management capability is indirectly associated with a sustainable competitive advantage via knowledge management. Therefore, we can propose an eighth hypothesis (H8).

**Hypothesis 8:**

The relationship between enterprise information management capability and sustainable competitive advantage is mediated by knowledge management.

**3.4.2.3 The Indirect Relationships between Enterprise Information Management Capability and Sustainable Competitive Advantage through Knowledge Management and Total Quality Management**

We have discussed the concepts underpinning Hypothesis Four (H4) concerning the positive relationship between enterprise information management capability and knowledge management. This is implicitly supported in the existing literature (Chuang et al., 2013; Alavi & Leidner, 2001; Gold et al., 2001; Gupta et al., 2000; Jackson, 1999). We have also considered the background underlying Hypothesis Six (H6) dealing with the positive relationship between knowledge management and total quality management, which is also supported by the literature (Kongpichayanond, 2013; Hung et al., 2010; Zhao & Bryar, 2001; McAdam & Leonard, 2001). Equally we have looked at the basis of the argument for Hypothesis Three (H3), that total quality management will have a direct positive relationship with sustainable competitive advantage, also supported in the existing literature (Nasseef, 2010; Young Kim et al., 2010; Santos-Vijande & Álvarez-González, 2009; Abdullah et al., 2008; Idris & Zairi, 2006; Lee, 2002). Equally, we have considered the supporting literature that suggests that organizations that have a combination of KM and TQM can achieve SCA (Hsu & Shen, 2005; McAdam & Leonard, 2001).

Based on all of the above, it is possible to predict that in addition to the direct positive impact of EIMC on SCA, EIMC may flow through KM and then flow through TQM to positively impact upon SCA again. Once again, the effect of business

intelligence technology (one of EIMC dimensions) on SCA can serve as an example. This time we will view it in terms of the indirect relationships between enterprise information management capability and sustainable competitive advantage through knowledge management and total quality management. If the business intelligence technologies enable a firm to generate knowledge regarding the customer focus dimension of its TQM program (e.g. customer behavior and leading indicators of how they spend their money), then this knowledge can be leveraged by the TQM team to support the firm's marketing capabilities and gain a comparative advantage by expanding market presence and customer base. As such, we can expect a positive indirect association between EIMC and SCA through both KM and TQM. This leads to the ninth hypothesis (H9).

**Hypothesis 9:**

The relationship between enterprise information management capability and sustainable competitive advantage is serially mediated by knowledge management and total quality management.

**3.5 Chapter Summary**

This chapter has built upon previous chapters and explained the conceptual model and nine hypotheses in the light of dynamic capability theory. The conceptual model and hypotheses were based on a thorough review of the relevant literature. This chapter also considered KM, TQM and both KM and TQM as mediating variables. Table 13 summarizes the hypotheses.



Table 13: Summary of Hypotheses

<b>Hypothesis</b>	<b>Description of Hypotheses</b>
H1	Enterprise information management capability will have a direct positive relationship with sustainable competitive advantage.
H2	Enterprise information management capability will have a direct positive relationship with total quality management.
H3	Total quality management will have a direct positive relationship with sustainable competitive advantage.
H4	Enterprise information management capability will have a direct positive relationship with knowledge management.
H5	Knowledge management will have a direct positive relationship with sustainable competitive advantage.
H6	Knowledge management will have a direct positive relationship with total quality management.
H7	The relationship between enterprise information management capability and sustainable competitive advantage is mediated by total quality management.
H8	The relationship between enterprise information management capability and sustainable competitive advantage is mediated by knowledge management.
H9	The relationship between enterprise information management capability and sustainable competitive advantage is serially mediated by knowledge management and total quality management.

## **Chapter 4: Research Methods**

### **4.1 Introduction**

After the discussion above regarding the theoretical framework and literature review, I will now present the systematic approach followed in this study in order to match my research aims. First, I will describe the research paradigm, then the research design and data analysis techniques.

### **4.2 Research Paradigm**

This dissertation was informed by a positivist research paradigm. Positivist studies tend to deal with naturally occurring phenomena, objective analysis and numerical outcomes. In this approach, the researcher is assumed to be independent from the study and often adopts a quantitative approach. He or she focuses on the causality of facts and formulates and tests hypotheses.

### **4.3 Research Design**

This research was carried out using primary sources. I adopted a mixed methods approach, which combines both qualitative and quantitative methods to facilitate the validation of data through a cross-verification from different sources. As Bryman (2006) has noted, a mixed methods approach may be used for several reasons (see Table 14).

Table 14: Reasons for Using Mixed Method Designs

<b>Reasons</b>	<b>Explanation</b>
Triangulation	Two or more independent sources of data, or data collection methods, are used to combine the research findings.
Facilitation	One data collection method is used to support research by another data collection method within the same study. For example, qualitative/quantitative data for formulating hypotheses, aiding measurement, both quantitative and qualitative treatment of participant responses or case selection.
Complementarity	Two or more research strategies are used to merge dispersed parts of the research. For example, adding qualitative data to a quantitative questionnaire to fill in gaps; adding quantitative data to qualitative questionnaires for exploring issues, followed up by interviews to ascertain meaning.
Generality	Independent sources of data are used to further clarify a main study or the use of a quantitative analysis to provide a sense of importance. For example, qualitative plus quantitative data sets a case in a broader context.
Aids Interpretation	Qualitative data is used to help explain relationships between quantitative variables (e.g. quantitative/qualitative data).
Study Different Aspects	Quantitative approach to look at the macro aspects and a qualitative approach to look into the micro aspects.
Solving a Puzzle	An alternative data collection method is used when the premier method could not explain some results or leads to insufficient data.

According to Tashakkori and Teddlie (2003), mixed methods are useful if they provide better opportunities for researchers to answer research questions, and when they allow researchers to better evaluate the extent to which the research findings can be trusted and valid inferences be drawn from them.

This approach has the advantage of avoiding the shortcomings of a single approach. For example, using quantitative approaches such as questionnaires alone does not facilitate the inclusion of open questions, and therefore it cannot gather in-depth responses and cannot explain the reasons behind individual responses. The present study starts with qualitative interviews in order to learn what practitioners think about the constructs that underlie the research, and the relationships captured in the research model. Their statements about the way they understood these things not only provide useful data, but also enabled me to refine the research model, provide qualitative support for the proposed theoretical framework, and modify the questionnaires used in the quantitative stage of the research.

Creswell (2013) illustrates three basic ways of designing mixed methods research, convergent parallel, explanatory sequential, and exploratory sequential mixed methods (see Figure 4). A mixed methods design is used in the present study. I collected both qualitative and quantitative data and analyzed them separately. I used the qualitative findings to refine my survey through improving some terminologies to eliminate any confusion to practitioners (see section 4.3.2.1). I then compared the results to see if the findings confirmed or failed to confirm each other, and to provide further explanation to the quantitative results. The key assumption of this approach is that the quantitative data can be explained in more detail through the qualitative approach. This methodology is appropriate for the objectives of the present study because it aimed to investigate the impact of EIMC on KM, TQM and SCA.

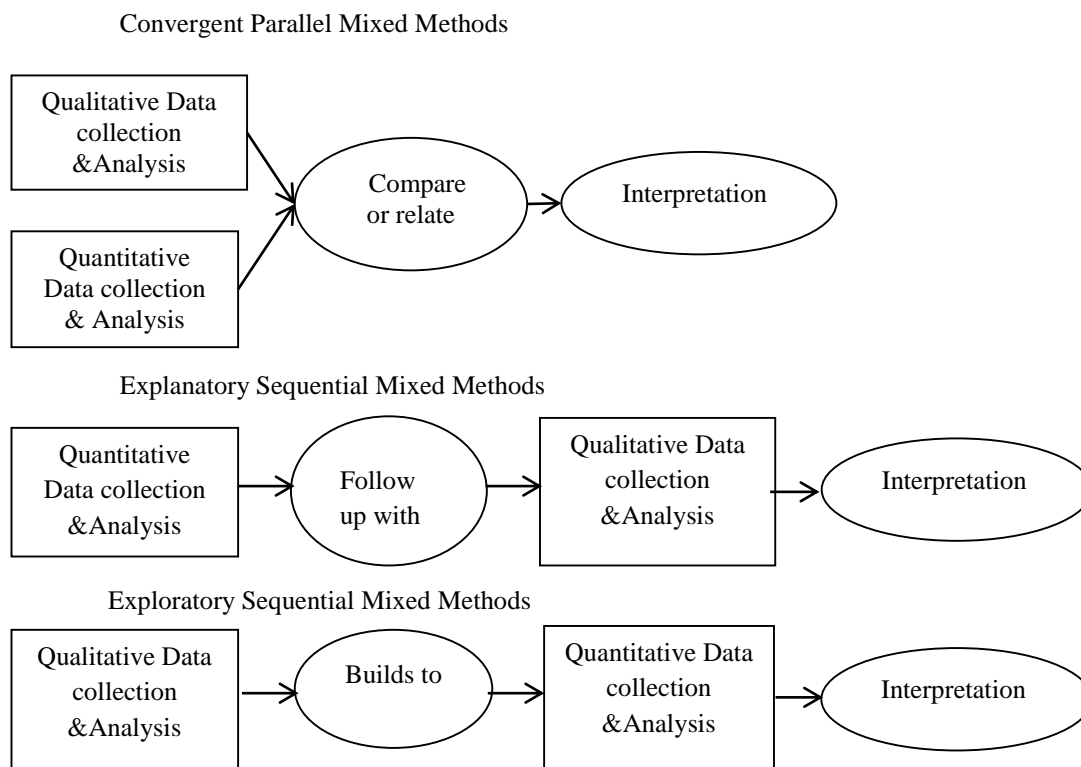


Figure 4: Types of Mixed Methods Design

### 4.3.1 Qualitative Research

#### 4.3.1.1 Qualitative Research Design

The qualitative research design of the present study relies on semi-structured interviews and to some extent on document analysis. In order to conduct the interviews, I developed an interview protocol that captured all of the key concepts and relationships represented in the research model. I relied significantly on the literature that I had reviewed to help to operationalize the concepts in terms of possible interview questions.

I developed the following criteria for selecting appropriate interviewees:

1. Interviewees had to be in active positions in an organization in the UAE.

2. Interviewees needed to be knowledgeable about at least one of the study's constructs (EIMC, KM, TQM, or SCA).
3. Interviewees were required to be in a middle management position or higher.
4. No organization could provide more than one interviewee.
5. Organizations were identified by their TQM practices (the participants were drawn from the winners' lists of the Shaikh Khalifa Excellence Award or the Dubai Quality Award).
6. All interviews were carried out in the same month.

#### **4.3.1.2 Response Characteristics**

Twelve (12) interviews were carried out with middle level managers (e.g. chief operations officers, managing directors and managers) and IT experts (e.g. data management experts, senior advisors, managing director's advisors). The interviewees were selected on the basis of their involvement with EIMC, KM, TQM and SCA, or on their ability to offer insights based on their experience of EIMC. The interviewees were selected from 12 organizations across various UAE industries (e.g. utilities, oil and gas, tourism, energy and sustainable energy). The interviews data transcript ran to 30,687 words on 57 pages. Table 15 shows the demographics of the interviewee sample.

Table 15: Interview Sample Demography

No.	Participant Code	Job Title/ Description	Gender	Years of experience	Company Code	Designation	Industry
1	A. M.	Data Management Senior Expert	Male	25	Company A	Governmental	Logistics
2	M. A.	Senior Advisor	Male	14	Company B	Semi-Governmental	Oil & Gas
3	A. A.	Human Capital Director	Male	10	Company C	Governmental	Investment
4	M. A.	Director	Male	15	Company D	Governmental	Tourist and Culture
5	Dr. A. Al.	Director General Advisor	Male	20	Company E	Governmental	Energy and Utilities
6	A. S.	Manager	Female	14	Company F	Governmental	Information and Communications Technology (ICT)
7	E. A.	Manager	Female	18	Company G	Governmental	Banking and Financial Services
8	S. A.	Manager	Female	18	Company H	Governmental	Energy and Utilities
9	A. N.	Manager	Male	18	Company I	Governmental	Media
10	AS. A.	Manager	Female	17	Company J	Governmental	Energy and Utilities
11	Dr. M. A.	Senior Manager	Male	20	Company K	Governmental	Education
12	SA. A.	Senior Manager	Male	20	Company L	Semi-Governmental	Energy and Utilities

The semi-structured interviews covered all topics of interest. At the same time, care was taken to encourage the interviewees to use their own language to describe the processes, characteristics, and use of EIMC, KM, TQM and SCA. Examples of core interview question that were included were as follows: How does your organization's enterprise information management empower your business capabilities? How do you see EIM empowering such business capabilities as compliance with regulations? What are the key capabilities/resources that present a competitive advantage for your organization? In addition, why do you consider these to be key capabilities? Appendix B includes the protocol and interview questions. I focused on understanding the language and practices of the firms concerned and on the relevance of the constructs to the interviewees' own experience. The language of the interviews was always either Arabic or English, in order to ensure the comfort of the interviewees, avoid any potential misunderstandings and enhance the quality of the interview outcomes.

#### **4.3.1.3 Qualitative Data Analysis Approach**

I started analyzing the data by developing a coding (organizing) framework. This involved the use of codes for concepts drawn from the research model and for the key themes that emerged from the data. I then coded the transcripts according to these schemata. Appendix C illustrates the broader themes of the study, which I relied upon when classifying the interview transcripts. I then juxtaposed sentences or paragraphs from raw, non-summarized transcripts with one or more of the codes. This framework then became the basis for classifying data and interpreting relationships. I used Excel, which was adequate for providing a single repository for all the research material, and was capable of handling research data with consistent coding schemes. It helped to organize my data analysis by managing and organizing data, managing ideas, and



categorizing details. In analyzing the coded data, I created summaries of the key themes from each interview, which were often drawn from quotations from the interview transcripts. I also made ongoing notes to draw my attention to certain elements in the data interpretation and analysis. The results are presented in Chapter Five (5), together with the results of the quantitative data analysis.

### **4.3.2 Quantitative Research**

#### **4.3.2.1 Measurement of Variables**

As noted above, the objective of the present research is to investigate the impact of enterprise information management capability (EIMC) on sustainable competitive advantage (SCA), with the aim of understanding whether this impact is mediated by knowledge management (KM) and total quality management (TQM), or serially mediated by both. EIMC, KM, TQM, and SCA are the four constructs that I am aiming to measure. Constructs are latent variables that can be measured indirectly through their manifestations (scales). The independent variable in the present study is EIMC, and the dependent variables are KM, TQM and SCA.

Typically, the first step in questionnaire development entails adapting those pre-existing survey instruments that suit the context of the current research and have both high reliability and validity indices. In order to ensure this, I proposed a definition of EIMC, KM, TQM and SCA, together with a comprehensive set of dimensions that can define them, and selected surveys that were capable of covering every dimension of all four constructs. I also limited my survey selection to questionnaires that were based on the existing literature and captured results that demonstrated the validity and reliability of the questions. It is worth mentioning here that many researchers have devised surveys that measure KM, TQM and SCA. Therefore, I selected the ones

which were easiest to comprehend, and which had shorter lists of questions. However, this was not the case when selecting a survey to measure EIMC (this will be discussed in detail the following EIMC scales subsection). Then, to ensure the quality and user friendliness of the survey, one academic and three practitioners who were experts in the areas of EIMC and TQM were asked to test both the face validity and appropriateness of the language in the questionnaire. Minor refinements were made according to their comments and based on the intended interview outcomes. First, it was clear from the interviews that some items and terms were interpreted in different ways by different interviewees. Therefore, to eliminate any confusion simple definitions and examples of terms were included with the questions. More specifically, I changed the EIMC definition to a simpler one and provided some practical examples, besides including simple definition of each construct (EIMC, KM, TQM and SCA) to the beginning of the relevant survey section. Question number three in the EIMC survey was altered so that the term ‘achieving information governance’, was accompanied by the definition that, information Governance is the specification of decision rights and an accountability framework to ensure appropriate behavior in the valuation, creation, storage, use, archiving and deletion of information. It includes the processes, roles and policies, standards and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals. Furthermore, I elaborated question number six on how value is created from business information, by providing examples regarding improvements in quality, customer service, and new product development.

Also, question number seven about the information lifecycle “Manage the cost of collecting, storing, and securing information throughout the lifecycle”. I further elaborated the term of lifecycle by adding ‘from creation to destruction’. It was

explained that enterprise information management (EIM) is the set of business processes, disciplines and practices used to manage the information created from an organization's data as an enterprise asset. EIM functions ensure that high quality information is available, protected, controlled and effectively leveraged to meet the knowledge needs of all the enterprise's stakeholders, in support of the institution's mission. Examples of EIM initiatives included data warehousing, business intelligence, enterprise content management and information governance (data governance). In the section on SCA, the questions asked about capabilities instead of resources and capabilities.

The four construct scales were set out as a seven point Likert type scale, anchored at 'strongly disagree' (1), to 'strongly agree' (7), with 'neither agree nor disagree' (5) in the middle. Table 16 shows each construct, a description of its scales and the instruments that were used in this research.

### **Scale Items for Enterprise Information Management Capability**

To develop the enterprise information management capability instruments, I first reviewed and analyzed recent studies in the area of enterprise information management. To the best of my knowledge, only the paper by Hausmann et al. (2014) entitled, "Enterprise Information Management Readiness: A survey of current issues, challenges and strategy" has so far developed a survey which measures the concept of EIMC. This paper used a survey called the "2013 EIM survey", which was part of a longitudinal study. EIMC was measured with eight items. Finally, on the basis of the EIMC dimensions developed during the literature review phase, I had the confidence to decide whether the survey based on Hausmann et al. (2014) covered all of the desired EIMC dimensions and was sufficient for my study. Fortunately, their survey

covered all the requisite EIMC dimensions. For this reason, I judged that I could rely on it to provide a basis for developing measures for the EIMC construct (see Table 12: Section 2.6).

### **Scale items for Knowledge Management**

To develop knowledge management (KM) instruments, I reviewed and analyzed recent research in knowledge management. As above, I found several surveys that measured KM and selected the one that best served the purposes of this study. A study by Gold (2002) provided an instrument that included eleven questions measuring KM practices, and these made it suitable for use as part of my survey instrument.

### **Scale for Total Quality Management**

To develop total quality management (TQM) instruments, I analyzed research in the area of total quality management. Many surveys that measured TQM were found and I chose one that met the purposes of my study. Research by Young (2015) put forward an instrument including sixteen questions that measured TQM, which made it suitable for my purposes.

### **Scale for Sustainable Competitive Advantage**

In order to develop an instrument for assessing sustainable competitive advantage (SCA), I reviewed work in this field. Many surveys measured the SCA construct and I found one that served the current research objectives. Research by Young (2015) once again provided an instrument with five questions to measure SCA practices, that made it suitable as part of our instrument. The final consolidated questionnaire was developed originally in English. Appendix E contains a copy of the final consolidated questionnaire.

### **Demographic Questions**

The last section in the survey was developed to collect descriptive data on the participants, their demographic and job characteristics and their organizations. More specifically, it covers the participant's industry, sector, size, years of experience, job title and gender. Three control variables were considered: size of organization in terms of employee numbers, industry and years of experience.

Furthermore, this section included an open-ended question that allowed the participant to provide the researcher with insights into how her/ his organization utilized EIMC to improve KM, TQM and SCA. The question stated, "If there is anything about the way your organization is using enterprise information management capability (EIMC) to improve total quality management (TQM), knowledge management (KM) and to sustain competitive advantage (SCA), which you wish to write about, please do so in the space provided below".

Table 16: Survey Instruments and Sources

<b>Construct</b>	<b>Scale Description</b>	<b>Source of Survey Measures</b>
Enterprise Information Management Capability	<p>To what extent does my firm qualify in</p> <ol style="list-style-type: none"> <li>1. Meeting regulatory compliance requirements.</li> <li>2. Providing access to critical business information when it is needed.</li> <li>3. Achieving information governance.</li> <li>4. Integrating and sharing information externally with customers, suppliers, and business partners.</li> <li>5. Integrating and sharing information internally between departments.</li> <li>6. Creating value from business information.</li> <li>7. Managing the cost of collecting, storing, and securing information throughout its lifecycle.</li> <li>8. Using information assets to provide business intelligence.</li> </ol>	Hausmann et al. (2014)
Sustainable Competitive Advantages	<ol style="list-style-type: none"> <li>1. My organization's resources or capabilities are so valuable that they enable us to exploit opportunities or neutralize threats in our external environment.</li> <li>2. My organization has costly to imitate resources or capabilities that our competitors cannot easily imitate or develop.</li> <li>3. My organization has difficult to substitute resources or capabilities that cannot be easily substituted by those of our competitors.</li> <li>4. My firm has mainly produced above average market return.</li> <li>5. My organization has shown persistent superior business performance to our competitors for a long time.</li> </ol>	Young (2015)
Knowledge Management Practices	<ol style="list-style-type: none"> <li>1. My organization has difficulty acquiring new knowledge.</li> <li>2. My organization regularly seeks out new knowledge.</li> <li>3. My organization generates new knowledge.</li> <li>4. My organization integrates or combines different sources and types of knowledge.</li> </ol>	Gold(2002)

Table 16: Survey Instruments and Sources (Continued)

Construct	Scale Description	Source of Survey Measures
	<p>5. My organization widely distributes knowledge.</p> <p>6. My organization stores knowledge.</p> <p>7. My organization easily retrieves its knowledge</p> <p>8. My organization easily applies its knowledge.</p> <p>9. My organization has employee rules of conduct regarding knowledge.</p> <p>10. My organization protects its knowledge from inappropriate knowledge</p> <p>My organization protects its knowledge from theft.</p>	
Total Quality Management	<p>1. Our top management provides personal leadership for quality products and quality improvement.</p> <p>2. Our top management creates and communicates a vision focused on quality improvement.</p> <p>3. Employees receive quality-related training.</p> <p>4. Employees are recognized and rewarded for superior quality improvement.</p> <p>5. Customer complaints are used as a method to initiate improvements in our current processes.</p> <p>6. Our customers give us feedback on our quality and delivery performance.</p> <p>7. We actively engage suppliers in our quality improvement efforts.</p> <p>8. We maintain close communication with suppliers about quality considerations and design changes.</p> <p>9. Clear work or process instructions are given to employees.</p> <p>10. We make extensive use of statistical techniques to reduce variance in processes.</p> <p>11. Our plant/shop floor is kept clean at all times.</p> <p>12. We thoroughly review new product/service design before the product/service is produced.</p>	Young (2015)

Table 16: Survey Instruments and Sources (Continued)

Construct	Scale Description	Source of Survey Measures
	<p>13. We work in teams, with members from a variety of areas (marketing, purchasing, manufacturing, etc.) to introduce new products/services.</p> <p>14. Information on quality performance is readily available to employees.</p> <p>15. Our quality data (error rates, defect rates, scrap, etc.) are accurate and reliable.</p> <p>Quality data are timely.</p>	
Demographic Questions	<p>1. Please indicate which of the following industries best reflect your organization (Manufacturing, Construction, Financial Services, Oil &amp; Gas, Hospitality, Agriculture, Utilities, Education, Other - Please Specify).</p> <p>2. Indicate which of the following sectors that best describes your organization. (Governmental, Semi-Governmental, Private)</p> <p>3. Approximately, how many employees do you have in your organization? (0-2000, 2001-4000, 4001-6000, 6001-8000, 8001-10000, More than 10000)</p> <p>4. Please indicate how long you have been working in your current job position (Less than 1 year, 1 - 3 years, 4 - 6 years, 7 - 10 years, More than 10 years)</p> <p>5. Please indicate how long you have been with your current organization (Less than 1 year, 1 - 3 years, 4 - 6 years, 7 - 10 years, More than 10 years)</p> <p>6. Please indicate your job title_____</p> <p>7. Please, what is your Gender (Male, Female)?</p>	
Optional Question	<p>If there is anything about the way your organization is using enterprise information management capability (EIMC) to improve total quality management (TQM), knowledge management (KM) and to sustain competitive advantage, which you wish to write about, please do so in the space provided below.</p>	



### **4.3.2.2 Survey Administration**

#### **4.3.2.2.1 Sample Selection and Data Collection**

As I considered EIMC to be an important tool in the pursuit of SCA, I conducted the survey in a purposefully selected UAE organization that was considered as advanced in terms of TQM. To make sure that this was the case, I drew the sample of participants from the list of winners of the Shaikh Khalifa Excellence Award (SKEA) and the Dubai Quality Award (DQA), because SKEA and DQA are concerned with UAE organizations that have adopted TQM. Their support was essential in identifying organizations that contained suitable candidates for both the interviews and the web questionnaire.

The quantitative data was collected via a web-based questionnaire. The questionnaire was hosted on the Qualtrics platform (one of the most popular web survey companies used for data collection). This approach was adopted because web surveys are relatively inexpensive to administer, provide a sense of privacy and confidentiality, and make it easy to detect and control empty fields or inappropriate responses. The platform that was used does not allow respondents to participate more than once. In addition, it was a mobile friendly tool, which meant that participants could easily view from their mobile or PC without disturbing the appearance of the fields (see Appendix F).

The online survey was distributed by email (see Appendix D). A covering letter was attached to the questionnaire that explained the purpose and aims of the study, and gave an assurance that individual responses would be kept strictly confidential.

The target sample was mid-level managers and above. My choice of middle managers was based on previous research findings that identified this level of managers as interesting from a theoretical standpoint, since their work can vary from relatively structured to unstructured and they have access to more resources and information than other employees (Johnson & Frohman, 1989; Spreitzer et al., 1997). Given that my study focused on exploring and testing the impact of EIMC, and given that this is a relatively new discipline in UAE, I believed that a sample of mid-level managers (and above) was the most appropriate choice.

The managers who took part in this study were drawn from a cross section of organizations that had had experience of TQM and would therefore be able to provide insights into its challenges from a mature perspective rather than from a perspective that might be beset by the challenges encountered during the start-up phase. Therefore, I chose SKEA and DQA as the main sources of information about which organizations to target.

The questionnaire and covering letter was sent to the staff at SKEA (in Abu Dhabi) and the Dubai Quality Award (in Dubai), who then forwarded it to the target groups, which are all UAE organizations (governmental, semi-governmental, private) that adopt TQM. In addition, to increase the number of participants, the LinkedIn service database was used to obtain contact details of manager from other organizations who might participate. This was done after an initial screening of their organizations to make sure they had a dedicated entity that practiced TQM and/ or KM. This was vital for determining whether the participants who had come through the LinkedIn channel were eligible and met the same criteria as those selected through the SKEA and DQA conduit. It is worth mentioning that a few of the participants

preferred to receive the link to the questionnaire through WhatsApp for reasons associated to their corporate email security. As Qualtrics facilitates the use of social media, without revealing the identity of participants, this communication channel was also used to distribute the link to the survey. The survey was alive for almost three months (from 10<sup>th</sup> November, 2016 to 8<sup>th</sup> February, 2017).

#### 4.3.2.3 Response Characteristics

Nine hundred and eighty (980) targeted participants were invited to complete the questionnaire in both Abu Dhabi and Dubai. In the end, 321 people viewed the questionnaire and 150 people took part in the process. The number of completed questionnaires reached 144. This constitutes a response rate of 15.3%. About 75% of the respondents were male and 25% were female as shown below in Table 17 and Figure 5.

Table 17: Target Sample and Completed Responses

<b>Description</b>	<b>Total</b>
Initial number of people invited.	980
People who viewed the questionnaire.	321
People who participated in the questionnaire.	150
People who completed the questionnaire.	144
Male respondents.	108
Female respondents.	36

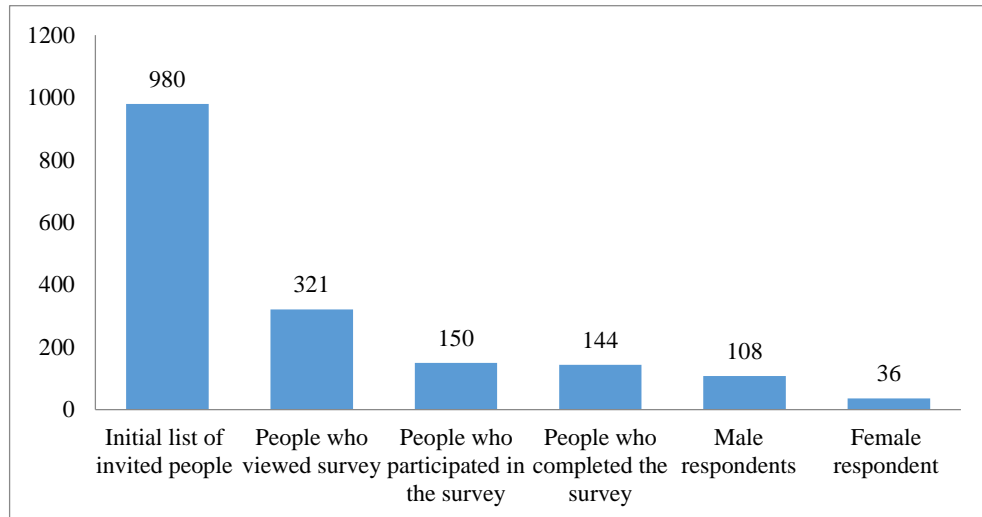


Figure 5: Sample Characteristics

The survey respondents came from a cross-section of industries. Energy and utilities, as well as the oil and gas industries were the most highly represented amongst the targeted organizations: constituting 14% and 12% of the targeted organizations respectively. Most of the respondents (67.9%) had been in their current organizations for more than 4 years. Table 18 and Figure 6 show the participants' classification by industry and years of experience with their current organizations.

Table 18: Participants by Industrial Classification and No. of Years in the Current Organization

Industry	No. of Years in Current Organization					Grand Total
	Less than 1 year	1 - 3 years	4 - 6 years	7 - 10 years	More than 10 years	
Construction	2	1		1	2	6
Education		1	3		1	5
Manufacturing		2	3	2	2	9
Oil & Gas		1	3	2	11	17
Others	4	14	14	13	7	52
Banking and Financial Services	1	3	2	3	1	10
Energy and Utilities	1	5	5	5	4	20
Health Care	1		1	1	2	5
Information and Communication Technology (ICT)	1	1	3	2	2	9
Media	1	1		3	1	6
Logistics	1	4				5
<b>Grand Total</b>	<b>12</b>	<b>33</b>	<b>34</b>	<b>32</b>	<b>33</b>	<b>144</b>
<b>Percentage</b>	<b>8.3%</b>	<b>22.9%</b>	<b>23%</b>	<b>22%</b>	<b>22.9%</b>	

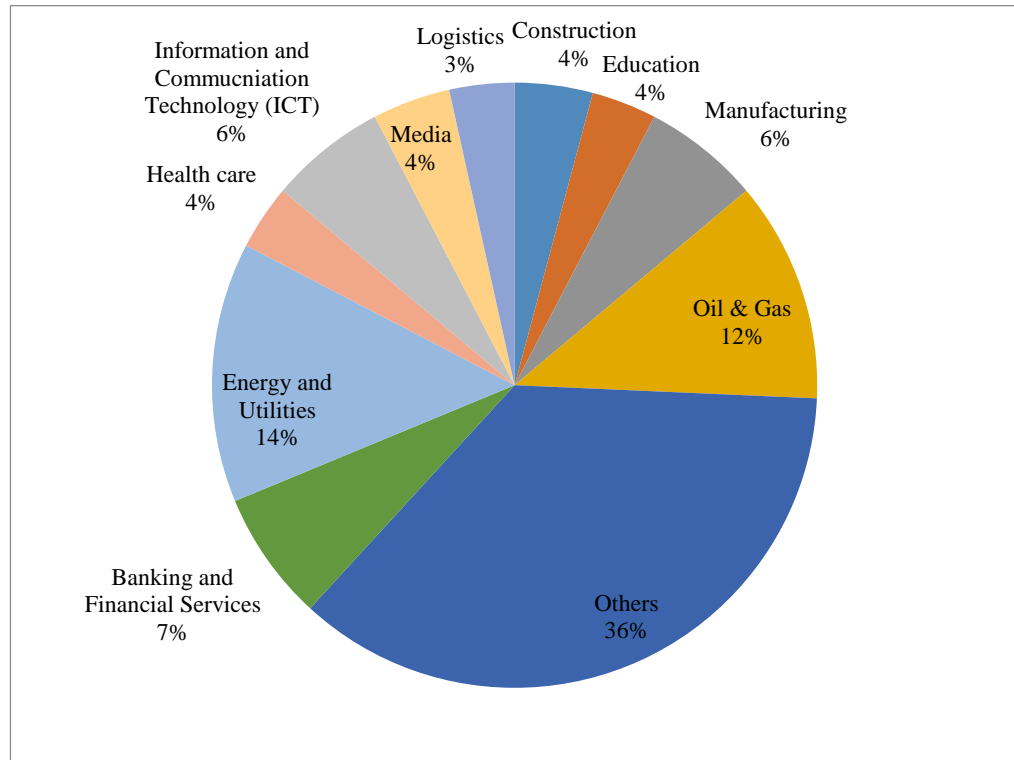


Figure 6: Industrial Classification of Participants

Table 19 shows the number of participants per organization size and sector type. Around 83% of the participants were from government and semi-governmental organizations. We conclude from Figure 7 shows that almost 55.5% of the participants came from organizations with fewer than 2,000 employees (80 participants out of 144), and the remaining 44.4% of participants came from organizations with more than 2,000 employees.

Table 19: Participants by Organization Size and Sector Type

Organization size	Sector type			Grand Total
	Governmental	Private	Semi-Governmental	
0-2000	41	16	23	80
2001-4000	9	2	6	17
4001-6000	2	3	2	7
6001-8000	5		10	15
8001-10000	1		3	4
More than 10000	9	4	8	21
<b>Grand Total</b>	<b>67</b>	<b>25</b>	<b>52</b>	<b>144</b>

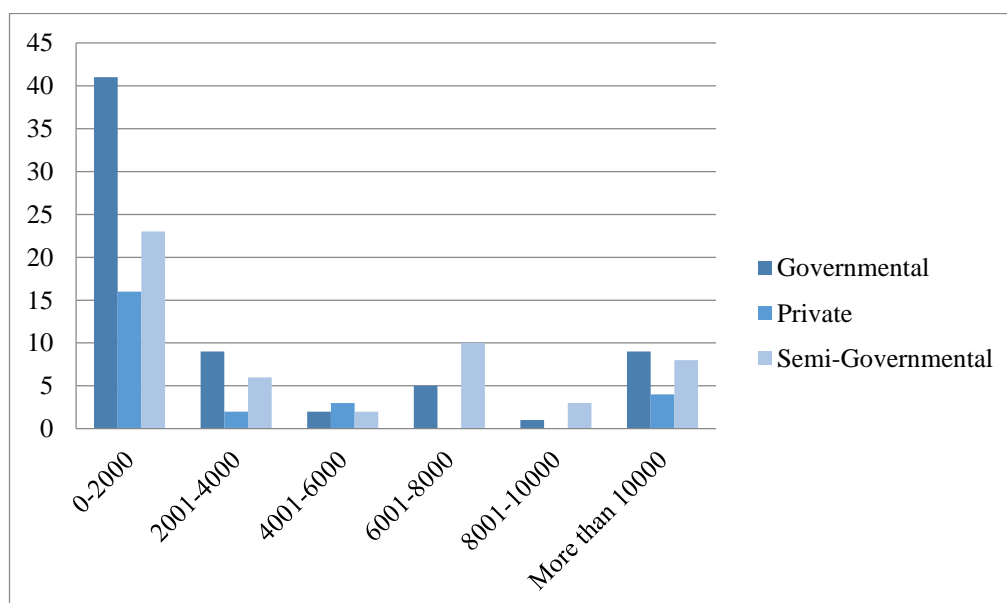


Figure 7: Participants by Organization Size and Sector Type

#### 4.3.2.4 Quantitative Data Analysis Approach

I used partial least squares (PLS) to analyze the quantitative data collected. PLS is a component-based latent variable modelling technique, which aims to maximize the variance explained in the dependent latent variables while minimizing measurement errors. It enables the path models involving latent variables to be estimated, where the latent variables are indirectly measured by multiple indicators (Chin, 2010). PLS can simultaneously examine theory (in a structural model) and measures (in a measurement model), and it makes no distributional assumptions about data. Unlike covariance-based structural equation modeling which relies on model fit statistics (Chin and Newsted, 1999; Hulland, 1999), PLS relies on the R-squared ( $R^2$ ) as the most appropriate statistical device for assessing the overall productiveness of a model. Bootstrap re-sampling was used to test the significance of the research results. The following are the rationales behind selecting a PLS approach.

The PLS approach is suitable for both expected non-normal data that is often collected in support of social science research, and for analyzing measurement models with formative indicators (i.e. the observed variables that cause the latent variables). This approach is also suitable when the size of the sample is small. The minimum sample size for PLS modeling is ten times the largest regression in the model (Chin & Newsted, 1999). In the present study, the construct requiring the most complex regression is SCA (with four paths leading to this construct), on this basis, the minimum sample size would be 40. My sample size of 144 was therefore adequate for PLS modeling.

I used Smart PLS release 2 to simultaneously estimate the measurement and structural models. The results were analyzed and interpreted in two stages: the



assessment of the reliability and the validity of the measurement model, and then the assessment of the structural model. This sequence ensured that I would have reliable and valid measures of the constructs before attempting to draw conclusions about the nature of their relationships.

The measurement model tested the reliability and validity of the data. This model allows for the reliability of individual items to be tested (just as confirmatory factor analysis does) through factor loadings. It uses composite reliability, which determines the internal consistency of the measures related to each construct, to assess construct reliability. Convergent validity is assessed using average variance extracted (AVE), and discriminant validity is assessed using the criteria proposed by Fornell and Larcker (1981), which calls for a square roots of AVEs to the correlation between constructs, together with the item cross-loadings.

#### **4.4 Ethical Considerations**

In the qualitative and quantitative approaches to the present study ethical considerations were addressed on three levels: the participant level, the level of the research-participant relationship, and the data level.

At the participant level (and as part of the qualitative data collection regime), the researcher provided all interviewees with an information form before or during their interviews. This form outlined the content and purpose of the research, with the goal of ensuring that interviewees should have all the information they might need to enable them to make sound decisions regarding their consent. Among other things, it addressed the risks that they might face in participating, their option to withdraw at any time, and the maintenance of both individual and institutional privacy and

anonymity. A researcher must ensure that each interviewee reads, completes, and signs a consent form. Both the information and the consent form were initially reviewed by an academic in the field of ethics. In addition, if during the interviews an interviewee started to react adversely to questions the researcher would discontinue the interview. The interviewees, in this case, were also asked to inform the researcher just before or after providing any confidential information/data, so that such data was not included in the analysis. A researcher also guarantees the privacy and anonymity of participants on both the individual and the institutional level, and ensures that no identifying data of any sort will be exposed. Researchers must in no way obtain any kind of data or information through deception.

At the participant level, the questionnaire included an adequate brief on the purpose and scope of the study. The online questionnaire was designed to allow the participants to take part voluntarily, if and only if, they had agreed to give their written consent. They were informed that they could withdraw at any time. The questionnaire questions guaranteed the privacy and anonymity of the participants at both the individual and institutional levels and ensured that no identification data of any sort would be exposed.

At the research-participant relationship level (and as part of the qualitative data collection regime), during face-to-face interviews, researcher maintained a professional relationship with the interviewees and avoided any situation that might change this relationship to friendship, such as accepting personal invitations or gifts. She also avoided asking for personal information that might reveal the speaker's identity. In addition, researcher took care not to intrude into the interviewees' time, space, or personal lives by keeping meeting times as short as possible and, after

seeking their permission, meeting interviewees in their offices or a neutral place during the working day. To avoid any conflict of interest that might affect the research, interviewees with whom she had had a relationship of any kind were not selected.

At the research-participant relationship level (and as part of the quantitative data collection regime), researcher found that the advantages of an online questionnaire were that it allowed the participants to complete it in whatever time they had available, and that it precluded direct contact with the participant.

At the data level (as part of the qualitative data collection regime), researcher maintained a high level of confidentiality for all the information. A soft copy of the research data was stored on an external USB flash drive and a hard copy of the research data is stored in my personal filing cabinet, which is always kept locked. For back up purposes, a second hard copy of all the research data was saved in another locked cupboard in a separate location. During the data analysis phase, she took great care not to make data misstatements and misinterpretations.

Again, at the data level, researcher maintained a high level of confidentiality. None of the information was shared with any third party. Qualtrics (the online questionnaire tool) does not allow researchers to trace the details of participants.

#### **4.5 Chapter Summary**

This chapter described the research paradigm, the design of the qualitative and quantitative methodology, data collection and approaches to data analysis, the data sample and the ethical consideration. As detailed above, twelve (12) interviews were conducted and 144 questionnaires were completed. This research was conducted with consideration of ethical implications by addressing the three levels of participant,

research-participant relationship, and the data. The following chapter discusses the data analysis and results in details.

## **Chapter 5: Analysis and Results**

### **5.1 Introduction**

This chapter presents the results of the qualitative and quantitative data analysis, and is structured in five sections (in addition to this introduction). Section 5.2 presents the results of the PLS measurement model focusing on a discussion of the reliability and validity of the constructs in the study. Section 5.3 discusses the test for common method bias. Section 5.4 presents the results of the structural model alongside the results of the analysis of the qualitative data and Section 5.5 summarizes and concludes the chapter.

### **5.2 Results of the Measurement**

As the constructs in this research are latent constructs, I evaluated the reliability and validity of their indicators. According to Neuman (2014), reliability refers to the dependability (or consistency) of the measure of a variable, while validity refers to its truthfulness (that is to say, it addresses the question of how well social reality is measured using this research construct). The reliability of the measurement models was assessed through individual item reliability and composite reliability, while the validity of the measurement models was assessed through convergent validity and discriminant validity (Hulland, 1999). In the following subsections, I will describe the assessment of the reliability and validity of the measurement model.

#### **5.2.1 Reliability**

Individual item reliability was assessed by examining the factor loading of each scale item. Adequate reliability is demonstrated when factor loadings for a construct are 0.7 or higher (Nunnally, 1978). Except for EIMC4, TQM11, TQM12 and TQM13,

all the indicators for the measurement models loaded higher than 0.7 on their respective constructs with p-values of less than 0.0001 (0.05 is the cut-off for p-value). Table 20 shows the research constructs' factor loading with their corresponding T-statistics. The result demonstrates adequate reliability. The four indicators that loaded below 0.7 were excluded from the measurement model.

Table 20: Constructs Factor Loading and T-statistics

<b>Latent Construct</b>	<b>Indicator</b>	<b>Actual Range</b>	<b>Mean</b>	<b>S.D</b>	<b>Loading</b>	<b>T-statistics</b>
Enterprise Information Management Capability (EIMC)	EIMC1	1-6	2.09	1.023	0.7022	31.4638
	EIMC2	1-7	2.27	1.172	0.7570	39.7580
	EIMC3	1-6	2.34	1.111	0.7312	32.7825
	EIMC5	1-7	2.17	1.005	0.6883	35.5898
	EIMC6	1-7	2.28	1.238	0.8524	89.1947
	EIMC7	1-7	2.64	1.237	0.7711	42.1625
	EIMC8	1-7	2.47	1.295	0.7549	45.4467
Knowledge Management (KM)	KM1	1-6	2.45	1.388	0.7894	50.8660
	KM2	1-7	2.45	1.347	0.7947	54.2729
	KM3	1-7	2.61	1.369	0.7643	39.6636
	KM4	1-7	2.50	1.389	0.8783	102.2687
	KM5	1-7	2.78	1.405	0.8206	68.6578
	KM6	1-7	2.79	1.456	0.7639	38.3791
	KM7	1-7	2.86	1.339	0.8432	64.8499
	KM8	1-7	2.72	1.354	0.8521	77.7247
	KM9	1-7	2.88	1.535	0.7651	39.8217
	KM10	1-7	2.52	1.532	0.7120	33.9259
	KM11	1-7	2.31	1.436	0.7097	33.3764
Total Quality Management (TQM)	TQM1	1-7	2.32	1.357	0.7659	60.8297
	TQM2	1-6	2.36	1.347	0.7668	51.9727
	TQM3	1-7	2.86	1.686	0.7452	41.3582
	TQM4	1-7	3.01	1.638	0.8165	62.2879
	TQM5	1-7	2.69	1.552	0.7925	49.3128
	TQM6	1-7	2.46	1.251	0.7173	42.0215
	TQM7	1-7	3.02	1.523	0.7628	49.3187
	TQM8	1-7	2.81	1.409	0.7275	45.6069
	TQM9	1-7	2.59	1.410	0.7056	35.2647
	TQM10	1-7	2.97	1.584	0.8055	56.2310
	TQM14	1-7	2.90	1.506	0.8191	69.2332
	TQM15	1-7	2.87	1.433	0.7906	61.3374
	TQM16	1-7	2.90	1.440	0.7913	63.1261
Sustainable Competitive Advantage (SCA)	SCA1	1-7	2.62	1.403	0.8325	65.2470
	SCA2	1-6	2.77	1.324	0.8441	84.4471
	SCA3	1-6	3	1.327	0.7652	38.1132
	SCA4	1-6	2.91	1.391	0.7097	26.6418
	SCA5	1-6	2.93	1.341	0.7651	47.6087
	SCA6	1-6	2.83	1.358	0.7756	44.3315
<b>All item loadings are statistically significant (<math>p &lt; 0.0001</math>, one-tailed); <math>n=144</math></b>						

In addition, a composite reliability of 0.7 or higher is considered as acceptable. Each of the measurement models had a composite reliability higher than 0.90 (see Table 21), indicating acceptable composite reliability. In addition, the Cronbach's Alpha values for the four constructs were between 0.87 and 0.94, which are higher than the minimum acceptable value for reliability (0.7).

Table 21: Measurement Model: Composite Reliability, Cronbach's Alpha and AVE)

<b>Latent Construct</b>	<b>Composite Reliability</b>	<b>Cronbach's Alpha</b>	<b>AVE</b>
EIMC	0.901	0.871	0.566
KM	0.949	0.940	0.627
TQM	0.950	0.942	0.594
SCA	0.905	0.873	0.614

### **5.2.2 Validity**

Scholars have emphasized that in PLS assessments the convergent and discriminant validity of a construct must be examined (Gefen & Straub, 2005). This section discusses how validity was assessed.

#### **Convergent Validity**

Convergent validity is the extent to which varying approaches to construct measurement yield the same results (Campbell & Fiske, 1959). I assessed the convergent validity of the measurement models by examining each construct's average variance extracted (AVE). The AVE of a construct is the grand mean value of the squared loadings of a set of indicators (Hair et al., 2014), and is equivalent to the communality of a construct. An AVE of 0.5 indicates acceptable convergent validity



(Chin, 1998; Hulland, 1999). As shown in Table 21, the AVEs for all the constructs in my model were higher than 0.5, demonstrating adequate convergent validity.

### **Discriminant Validity**

Discriminant validity represents the extent to which the construct is empirically distinct from other constructs or, in other words, the construct measures what it is intended to measure. A scale exhibits discriminant validity if its constituent items estimate only one construct (Bagozzi et al., 1991). I assessed the discriminant validity of each construct through Fornell and Larcker's (1981) criteria and cross loading. The Fornell and Larcker criteria involved comparing the square root of each construct's AVE to the correlations among the construct. Discriminant validity is confirmed when the square roots of the AVEs are higher than the associated correlations. The results of the Fornell and Larcker test in this study are reported in Table 22. In this table, the correlation coefficients are in the off diagonal and the square roots of the AVEs are in the diagonal. All the square roots of the AVEs are greater than the correlation coefficients, suggesting acceptable discriminant validity.

Table 22: Discriminant Validity

<b>Discriminant Validity and Correlations (SQR AVE)</b>				
<b>Latent Construct</b>	<b>EIMC</b>	<b>KM</b>	<b>TQM</b>	<b>SCA</b>
EIMC	<b>0.752</b>			
KM	0.4582	<b>0.7918</b>		
TQM	0.5739	0.7465	<b>0.770</b>	
SCA	0.4815	0.7201	0.6738	<b>0.7835</b>
<b>Diagonal elements are square roots of AVE</b>				
<b>Off-diagonal elements are correlations between constructs; n=144</b>				

Cross loading was also used to assess discriminant validity, since it shows how much one observed scale item loads onto more than one latent construct. The cross-loading assessment results are shown in Table 23. They show that the scale items loads higher on the construct that they are intended to measure than on any other construct, thus providing further evidence for discriminant validity.

Table 23: Cross Loading

Latent Construct	Indicator	EIMC	KM	TQM	SCA	T- Statistics
<b>EIMC</b>	<b>EIMC1</b>	<b>0.702</b>	0.375	0.368	0.379	<b>31.4638</b>
	<b>EIMC2</b>	<b>0.756</b>	0.349	0.370	0.423	<b>39.7580</b>
	<b>EIMC3</b>	<b>0.731</b>	0.360	0.385	0.347	<b>32.7825</b>
	<b>EIMC5</b>	<b>0.688</b>	0.275	0.410	0.313	<b>35.5898</b>
	<b>EIMC6</b>	<b>0.852</b>	0.353	0.522	0.371	<b>89.1947</b>
	<b>EIMC7</b>	<b>0.771</b>	0.352	0.481	0.322	<b>42.1625</b>
	<b>EIMC8</b>	<b>0.759</b>	0.349	0.488	0.380	<b>45.4467</b>
<b>KM</b>	<b>KM1</b>	0.326	<b>0.789</b>	0.6090	0.571	<b>50.8660</b>
	<b>KM2</b>	0.326	<b>0.794</b>	0.634	0.614	<b>54.2729</b>
	<b>KM3</b>	0.350	<b>0.764</b>	0.563	0.644	<b>39.6636</b>
	<b>KM4</b>	0.350	<b>0.878</b>	0.628	0.674	<b>102.2687</b>
	<b>KM5</b>	0.397	<b>0.820</b>	0.627	0.648	<b>68.6578</b>
	<b>KM6</b>	0.320	<b>0.764</b>	0.508	0.532	<b>38.3791</b>
	<b>KM7</b>	0.424	<b>0.843</b>	0.601	0.492	<b>64.8499</b>
	<b>KM8</b>	0.379	<b>0.852</b>	0.681	0.618	<b>77.7247</b>
	<b>KM9</b>	0.444	<b>0.765</b>	0.589	0.458	<b>39.8217</b>
	<b>KM10</b>	0.335	<b>0.713</b>	0.532	0.467	<b>33.9259</b>
	<b>KM11</b>	0.338	<b>0.709</b>	0.509	0.510	<b>33.3764</b>
<b>TQM</b>	<b>TQM1</b>	0.503	0.585	<b>0.765</b>	0.527	<b>60.8297</b>
	<b>TQM2</b>	0.435	0.598	<b>0.767</b>	0.568	<b>51.9727</b>
	<b>TQM3</b>	0.543	0.488	<b>0.745</b>	0.436	<b>41.3582</b>
	<b>TQM4</b>	0.503	0.590	<b>0.816</b>	0.510	<b>62.2879</b>
	<b>TQM5</b>	0.414	0.510	<b>0.792</b>	0.518	<b>49.3128</b>
	<b>TQM6</b>	0.302	0.460	<b>0.717</b>	0.452	<b>42.0215</b>
	<b>TQM7</b>	0.380	0.520	<b>0.762</b>	0.519	<b>49.3187</b>
	<b>TQM8</b>	0.361	0.477	<b>0.727</b>	0.389	<b>45.6069</b>
	<b>TQM9</b>	0.458	0.629	<b>0.705</b>	0.551	<b>35.2647</b>
	<b>TQM10</b>	0.476	0.607	<b>0.805</b>	0.577	<b>56.2310</b>
	<b>TQM14</b>	0.454	0.645	<b>0.819</b>	0.494	<b>69.2332</b>
	<b>TQM15</b>	0.430	0.647	<b>0.790</b>	0.587	<b>61.3374</b>
	<b>TQM16</b>	0.447	0.648	<b>0.791</b>	0.564	<b>63.1261</b>
<b>SCA</b>	<b>SCA1</b>	0.430	0.639	0.530	<b>0.832</b>	<b>65.2470</b>
	<b>SCA2</b>	0.376	0.714	0.636	<b>0.844</b>	<b>84.4471</b>
	<b>SCA3</b>	0.435	0.496	0.544	<b>0.765</b>	<b>38.1132</b>
	<b>SCA4</b>	0.360	0.472	0.430	<b>0.710</b>	<b>26.6418</b>
	<b>SCA5</b>	0.266	0.499	0.492	<b>0.766</b>	<b>47.6087</b>
	<b>SCA6</b>	0.402	0.516	0.523	<b>0.776</b>	<b>44.3315</b>

All item loadings are statistically significant ( $p < 0.0001$ , one-tailed);  $n = 144$

In summary, the above data analyses and evaluations show that my measurement model was satisfactory, reliable and valid.

### **5.3 Common Method Bias**

Common method variance is, “variance that is attributable to the measurement method rather than to the constructs the measures represent” (Podsakoff et al., 2003, p. 879). Common method bias is a serious concern for researchers using data collected through surveys (Chang et al., 2010). Since the quantitative data was collected using a survey instrument, it was possible for the responses to be impacted by common method bias. Therefore, I ran statistical analyses to assess whether common method bias was a serious issue. I implemented the single method factor design in the PLS model following the procedures adopted by Liang et al. (2007), where error variance at the indicator level is separated to remove its effect on the structural model (Chin et al., 2012). A common method factor from all the measures for the main constructs in my model was created and included in my PLS model. In order to include the common method factor, each measure was modelled as a single indicator latent variable (first order construct), followed by the common method factor as a second order construct of their respective single indicator variables. Then the common method factor and the substantive construct were included in the PLS model, with links to all the single indicator variables in the model. The path coefficient between the single indicator variables and the substantive and common method factor were interpreted as the factor loadings. The results of the PLS test were assessed in two steps. First, I examined the statistical significance of factor loadings on both the substantive construct and the common method factor. Secondly, I compared the percentage variance of all the

indicator variables, as explained by their substantive construct and by the method factor.

Table 24 shows an analysis of common method bias. The results indicate that all the loadings on the method factor were statistically insignificant, while those of the substantive construct were statistically significant. Moreover, the percentage of the variances of the indicator variables explained by the substantive construct (average variance = 0.022) was substantially greater than the percentage of variance explained by the common method factor (average variance = 0.002). The ratio of substantive variance to method variance was 11:1. These results indicate that common method variance is unlikely to be a serious concern for this study.

Table 24: Common Method Bias Analysis

Construct	Indicator	Substantive Factor Loading (R1)	R1 <sup>2</sup>	Method Factor Loading (R2)	R2 <sup>2</sup>
Enterprise Information Management Capability	EIMC1	0.1803	0.0325	0.0424	0.0018
	EIMC2	0.1897	0.0360	0.0427	0.0018
	EIMC3	0.1849	0.0342	0.0426	0.0018
	EIMC5	0.1739	0.0302	0.0422	0.0018
	EIMC6	0.2119	0.0449	0.0435	0.0019
	EIMC7	0.1936	0.0375	0.0429	0.0018
	EIMC8	0.1921	0.0369	0.0428	0.0018
Knowledge Management	KM1	0.1137	0.0129	0.0400	0.0016
	KM2	0.1148	0.0132	0.0401	0.0016
	KM3	0.1114	0.0124	0.0399	0.0016
	KM4	0.1259	0.0159	0.0405	0.0016
	KM5	0.1196	0.0143	0.0402	0.0016
	KM6	0.1093	0.0119	0.0399	0.0016
	KM7	0.1210	0.0146	0.0403	0.0016
	KM8	0.1239	0.0154	0.0404	0.0016
	KM9	0.1123	0.0126	0.0400	0.0016
	KM10	0.1042	0.0109	0.0397	0.0016
	KM11	0.1040	0.0108	0.0397	0.0016
Total Quality Management	TQM1	0.1002	0.0100	0.0395	0.0016
	TQM2	0.0999	0.100	0.0395	0.0016
	TQM3	0.0966	0.0093	0.0394	0.0016
	TQM4	0.1054	0.0111	0.0397	0.0016
	TQM5	0.1015	0.0103	0.0396	0.0016
	TQM6	0.0918	0.0084	0.0392	0.0015
	TQM7	0.0987	0.0097	0.0395	0.0016
	TQM8	0.0931	0.0087	0.0393	0.0015
	TQM9	0.0936	0.0088	0.0393	0.0015
	TQM10	0.1046	0.0109	0.0397	0.0016
	TQM14	0.1052	0.0111	0.0397	0.0016
	TQM15	0.1027	0.0106	0.0396	0.0016
	TQM16	0.1028	0.0106	0.0396	0.0016
Sustainable Competitive Advantage	SCA1	0.2204	0.0486	0.0439	0.0019
	SCA2	0.2337	0.0546	0.0443	0.0020
	SCA3	0.2080	0.0433	0.0434	0.0019
	SCA4	0.1897	0.0360	0.0428	0.0018
	SCA5	0.2084	0.0434	0.0434	0.0019
	SCA6	0.2134	0.0455	0.0436	0.0019
Average		<b>0.1394</b>	<b>0.0216</b>	<b>0.0409</b>	<b>0.0017</b>
<b>All P values &lt; 0.01</b>					

After assessing the reliability and validity of the measurement model and following the test for common method bias, I proceeded to the results of the PLS structural model.

#### **5.4 Results of the Structural Model**

In this section, I report on the results of the PLS structural model. These results provided the basis for hypotheses testing.  $R^2$ s were used to assess the productiveness of the structural model. The  $R^2$ s in this study ranged from 0.21 to 0.63 (see Table 25). These results show that my model was robust enough to predict the variance in the dependent variable from the independent variables.

The path coefficient examined the relationships that exist between two variables. The value, direction and significance of path coefficients were used to test the various hypotheses. Since PLS is a non-parametric approach, with no distributional assumptions about data, the significance of path coefficients was assessed using the bootstrap re-sampling approach. Bootstrap re-sampling based on 1,000 samples estimated the t-statistic for direct effects, and the confidence intervals for indirect effects. These became the basis for testing the significance of the path coefficients in my model. In the remainder of this section, I present the results of the direct relationship hypotheses tests and the results of the mediation hypotheses.

##### **5.4.1 Results of the Direct Relationship Hypotheses**

The PLS structural model results for the direct relationships hypotheses are presented in Table 25 and Figure 8 below and discussed in the subsections that follow.

Table 25: PLS Structural Model Results

Direct Effects - Path Coefficient, (t-statistics) and R <sup>2</sup>			
Latent Construct	Path to: KM	TQM	SCA
EIMC	0.452 (5.8730)	0.289 (11.6852)	0.116 (4.1119)
KM	-	0.640 (28.5502)	0.464 (11.5472)
TQM	-	-	0.263 (6.8533)
R <sup>2</sup>	0.21	0.63	0.58

All item t-values are statistically significant (p<0.0001, one-tailed), n=144

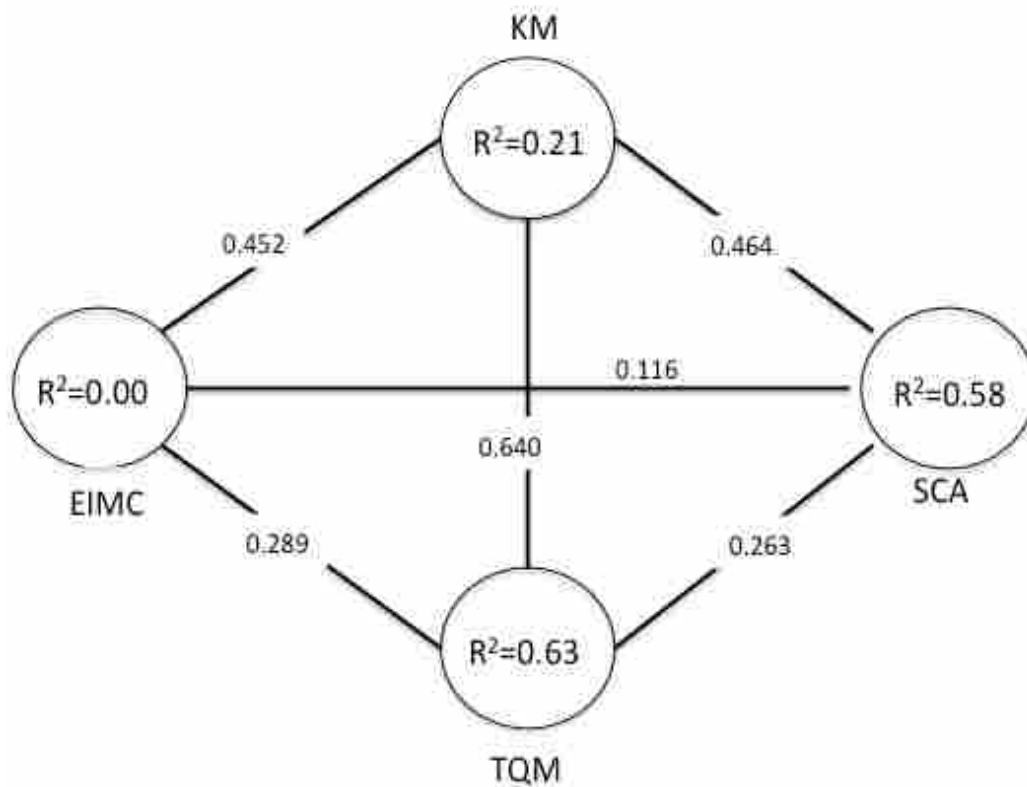


Figure 8: PLS Results of the Structural Model



#### 5.4.1.1 Hypothesis 1

Hypothesis 1 predicted a direct positive relationship between the extent of enterprise information management capability (EIMC) and sustainable competitive advantage (SCA). The structural path coefficient leading from the extent of EIMC to SCA was positive ( $\beta = 0.1155$ ) and statistically significant ( $p < 0.0001$ ). This confirmed a direct positive relationship, and thus provides support for Hypothesis 1. This finding is consistent with the literature, which argues that information management capability makes the creation and sustainability of a competitive advantage possible, or argue that EIM is an essential process is a prerequisite to achieve better performance (Zhou et al. 2008; Kichuk & Woledge, 2006; Ladley, 2009; Mithas et al., 2011). And add to that by suggesting enterprise wide information management capability as enabling valuable organizational dynamic capability that creates SCA.

In addition, the qualitative interview data provided support for Hypothesis 1. As above in Chapters 2 and 3, EIMC is essential for gaining SCA. SCA is said to been enhanced through seeking future opportunities, and I argued that EIMC was essential in seeking such future opportunities. EIMC equip organizations with the ability to gain valuable information that provides more insight to predict the future and in turn conquer opportunities quicker than competitors. This shall secure sustainable competitive advantage. For example, EIMC initiative such as data business intelligence and analytics enables decision makers to analyze the current and historical data stored in the data warehouse (or database repositories such as ERP repository) with analytical tools, in order to predict the future (predictive analytics) and so find opportunities more quickly than others. This was explicitly evident in the interview data. For example, Manager A. A. from Company C in the investment industry

explained how this approach enabled his company to predict the future and thus to make decisions that sustained a future competitive advantage. He noted:

*In [our organization] we have similar concept to data warehouse. We have used the ERP system to store all of our data in terms of recruitment, contract, requisition, all the services we provide our employees ... So the ERP enterprise system gives you that capability to compare (day by day, year by year, project by project, etc...), then you analyze the time, the quality, the total money invested. Then you analyze the reason why you are ahead or behind and what we need to do, this is only to maintain [the current situation]. On top of that, it gives you the competitive advantage over your competitors because your analysis will give you the tools to visualize the future, so we can understand what to budget for next year.*

He went on:

*[With the ERP system] we can understand if we fail or are behind, what are we lacking (cash, resources, time)? ... Through the ERP system, we have a data store, we can do some data analysis and we can predict the future. Without those tools, we will not be able to understand where we are today, what we need to do to improve our performance and how we can have competitive advantages in visualizing the future and spinning all our resources, these resources, in order to compete and win those competitions.*

He also explained the effects of enterprise information management capability on sustainable competitive advantage by referring to the usefulness of database integration to analyze the competitive environment in order to achieve a competitive advantage.

*We rely on the information that is stored in the database; we rely on the information about where our competitor goes, what the government announces. For example, in renewable energy what the government aims to do. Now we can tell that all governments not only UAE, [are] going to renewables to lessen the dependence on oil. So, that gives us the time to do a lot of research to prepare ... for that moment. Our preparation will give us the advancement and opportunity to be*

*ahead of our competitors who are not analyzing all the surrounding information that come internally and externally, so you can predict the future.*

Furthermore, he noted the outcome of being able to integrate internal and external data to get better analysis for data on tenders. This allows them to offer competitive prices and to win more tenders.

*When we applied to the tender for sustainable tender, everyone was surprised how low it was, and that was because we were prepared based on the information, analysis that we have done. Now people try to steal our information to understand how we managed to make a profit from a very low price.*

A senior expert in data management, A. M. from Company A in the logistics industry acknowledged the direct link between data integration (resulting from EIMC) and a better competitive position in the market, he remarked:

*We felt that [the] scattered applications are not doing well, and not providing a consistent and integrated visibility for the management about the status of projects. This might prohibit them from acquiring the appropriate funds from the government, because you need to justify your projects' previous execution performance to start new projects. That is why we decide to establish an enterprise information management strategy with a lot of initiatives ... So, yes, it will impact the company performance, and since our company is a government entity it doesn't have competitors.*

However, later on, to illustrate how he sees his organization's position vis-à-vis competitors, he added:

*... because in governmental entities, whenever you have a single entity that is managing this business by the force of law, here we can consider the 'conceptual' competition among the similar entities in different emirate. For instance if you have a transmission company in Abu Dhabi you can consider it virtually competing with similar transmission companies in Dubai, Sharjah and so on. Then you can benchmark your performance with your peers in other emirates, for instance. And, hence this is 'hidden competition.'*

Other interviewees shared these views. Overall, both the quantitative and qualitative results provided strong support for Hypothesis 1.

#### **5.4.1.2 Hypothesis 2**

Hypothesis 2 predicted a direct positive relationship between the extent of enterprise information management capability (EIMC) and total quality management (TQM). The structural path coefficient leading from the extent of EIMC to TQM was positive ( $\beta = 0.2888$ ) and statistically significant ( $p < 0.0001$ ). This confirms a direct positive relationship and thus provides support for Hypothesis 2. This finding is consistent with the literature and shows that information management capability and EIM initiatives, such as management information systems, decision support systems and data mining, are at the forefront of TQM practice (Zárraga-Rodríguez & Álvarez, 2013; Lee, 2002).

The interview data provided further support to Hypothesis 2. In Chapter 3, I argued that EIMC is a prerequisite for TQM. The interview data provided evidence that TQM is indeed, influenced by EIMC. For instance, I have argued that data management allows us to integrate and release information internally and externally. This was also evident in the interview data. A senior expert in data management, A. M. from Company A in the logistics industry identified the role that EIMC initiatives

play in TQM. In particular, when managing business performance through improving the quality of projects.

*Now my perception about the effect [impact] of this initiative [EIMC] on the company performance is that it will be very useful for the company for reporting and analytics from the performance management perspective specifically. One thing we also monitor through this initiative is the overall quality of the project, since we consider the overall quality of the project an essential dimension of the project performance.*

Manager A. N. from company I in the media industry recognized information technology, embedded in EIMC, as an essential tool for assisting the organization to manage its quality.

*Yes of course, I think technology [EIMC] is a core tool that quality people need to use, in order to have an easy or better and clearer accessible system for quality, and IT plays big part in it.*

Similar observations were shared by other interviewees. Together, the quantitative and qualitative evidence provides robust support for Hypothesis 2.

### **5.4.1.3 Hypothesis 3**

Hypothesis 3 predicted a direct positive relationship between the extent of total quality management (TQM) and sustainable competitive advantage (SCA). The structural path coefficient leading from the extent of TQM to SCA was positive ( $\beta = 0.2633$ ) and statistically significant ( $p < 0.0001$ ). This confirms a direct positive relationship and thus provides support for hypothesis 3. This finding is consistent with the literature on the relationship between TQM and SCA (Lakhal et al., 2006; Calvo-Mora et al., 2015; Hafeez et al., 2006).

Hypothesis 3 is further supported by the qualitative interview data. Chapter 3 presented arguments for a direct relationship between TQM and SCA. The interview data provides evidence that SCA is impacted by TQM. Recalling the argument that SCA is enhanced via achieving a better performance and meeting strategic and financial goals, TQM can be said to be a vital factor in all of these aspects. Manager M. A. from Company D in the tourism and culture industry explained the direct link between TQM and sustainable competitive advantage.

*The old and new EFQM focus on sustainability; it is explicit not implicit, and also focuses on competitiveness.*

Other interviewees also found this to be true. In brief, the quantitative and qualitative results also support Hypothesis 3.

#### **5.4.1.4 Hypothesis 4**

Hypothesis 4 predicts a direct positive relationship between the enterprise information management capability (EIMC) and knowledge management (KM). The structural path coefficient leading from the extent of EIMC to KM was shown to be positive ( $\beta = 0.4522$ ) and statistically significant ( $p < 0.0001$ ). This confirms a direct positive relationship, and thus provides support for Hypothesis 4. This finding is supported by several studies that indicated that information systems, and specifically EIMC initiatives (such as content/document management, data warehousing, data and text mining, and taxonomies) support and promote knowledge management (Jackson, 1999; Alavi and Leidner, 2001; Woods, 2004; Ruikar et al., 2007; Chang & Chuang, 2011).

The qualitative interview data provided further support for Hypothesis 4. In Chapter 3, we argued that EIMC influences KM through gathering and sharing information and that the sharing of information provides the capacity for knowledge sharing. The interview data provided evidence that EIMC was influential in knowledge management. For example, enterprise content management (an EIMC initiative) uses the organizational intranet to provide new employees with the proper training and to transfer the required knowledge about best practices. As a manager M. A. from Company B in the energy and utilities industry explains:

*...we do have initiatives such as on the job training, where experienced employees who are approaching retiring age spend the last few years of working in teaching the young employees ...Also from the system [Enterprise Content management] perspective, we developed our intranet. We try to make it more [better as a] data source of knowledge to all employees. In terms of good practices, good achievements, to be shared with all employees so they can copy it... We do have many small knowledge management initiatives with the ultimate goal to have a knowledge management system as a data base for all the knowledge we have, as a structured way to communicate knowledge to all who need it.*

Moreover, the enabling role of data warehouses in sharing and transferring knowledge was identified by Manager M. A. from Company B in the oil and gas industry.

*With data warehouse we can extract the data and give each user the cream of the data, what he needs to do his job, without compromising the security ... and confidentiality of the data.*

*It (KM) is a very big subject, we have many initiatives in our organizations in this regard, we have few systems called lesson learned systems, we analyzed the need for a corporate knowledge system to formalize thing to put things in structured manner how we communicate and the information and knowledge among the various stakeholders, this is still in process has not 100% materialized yet.*

Several interviewees shared similar beliefs. Together the quantitative and qualitative data provided support for Hypothesis 4.

#### **5.4.1.5 Hypothesis 5**

Hypothesis 5 predicted a direct positive relationship between knowledge management (KM) and sustainable competitive advantage (SCA). The structural path coefficient leading from the KM to SCA is positive ( $\beta = 0.4641$ ) and statistically significant ( $p < 0.0001$ ). This confirms a direct positive relationship and thus provides support for hypothesis 5. This finding is consistent with studies that show a positive relationship between knowledge management and a sustainable competitive advantage (Chuang, 2004; Gold et al., 2001).

Evidence from the qualitative interviews provides further support for Hypothesis 6. The interview data provided evidence that SCA was influenced by KM. As above, SCA is achieved by positioning an organization amongst its rivals and competing effectively thanks to such knowledge management practices as creating and exploiting knowledge. For example, the difficulty of keeping experienced workers who have the knowledge required to sustain the firm's market position has encouraged organizations to codify such knowledge in management systems (such as EIMC) in order to facilitate the transfer of this knowledge and experience to younger generations and in return sustain the firm's competitive advantage. On this subject, a senior expert in data management, A. M. from Company A in the logistics industry gave his opinion:



*Acquiring rare and costly human capital and sustaining it and transferring the knowledge of experienced staff to the new younger generation (through knowledge management practices) is very important for us to keep our relative position with similar governmental organizations in other emirates or in the Gulf region.*

*Recently, some of our experienced engineers left the organization. We decided to substitute them by recruiting newly graduated engineers. To sustain our superior performance (SCA) in managing the organization's capital projects, we decided to conduct comprehensive know-how acquisition programs in order to support the new engineers to acquire the know-how and the competencies necessary for them to do their job. This program includes knowledge-sharing sessions, on job practical training, mentoring, coaching and experimenting the task execution on software training environment developed specifically for this purpose.*

Other interviewees shared similar views. Together the quantitative and qualitative data provided support for Hypothesis 5

#### **5.4.1.6 Hypothesis 6**

Hypothesis 6 predicted a direct positive relationship between knowledge management (KM) and total quality management (TQM). The structural path coefficient leading from the extent of KM to TQM was positive ( $\beta = 0.6398$ ) and statistically significant ( $p < 0.0001$ ). This confirms a direct positive relationship and thus provides support for Hypothesis 8. This finding is consistent with prior research that examined the relationship between KM and TQM (Kongpichayanond, 2013; Hung et al., 2010; Ju et al., 2006; Hsu & Shen, 2005; Molina et al., 2004; McAdam & Leonard, 2001).

The qualitative interview data also supports Hypothesis 8. We can recall from Chapter 3 that to have TQM, KM is required. The interview data provides support for the view that TQM is influenced by KM. As above, TQM is achieved through

continuous improvement and customer management. KM practices such as collecting and sharing knowledge about services and products improve decision-making regarding TQM. The interview data provided evidence of this. For example, Manager M. A. from Company D in the tourism and culture industry identified the impact that training (which is one part of knowledge management) has on TQM.

*How we do TQM through my people – they need certain skills. I need to enhance their skills, they need to be trained, and they need to be empowered – what I mean by empowerment [is] the authority they have, the information, tools, and processes they follow.*

He also sees that adopting KM is essential for adopting the TQM model:

*... The government of Abu Dhabi has been adopting KM since 2007 and till today. By just the adoption of EFQM they were positioned for information management, knowledge management and decision-making. If you look at criterion 4 sub-criterion 5, it says clearly 'management of information and knowledge to support decision making', and they are used to rewarding excellence in organization in KM. Last cycle ADEC [Abu Dhabi Department of Education and Knowledge] won this award.*

Several interviewees were of the same opinion. Overall, the quantitative and qualitative data endorsed Hypothesis 6. Therefore, in tune with our theoretical expectations, all six of the direct relationship hypotheses were supported.

#### **5.4.2 Results of the Mediation Effect Hypotheses**

I examined mediating relationships in my conceptual model, following the approach of Zhao et al. (2010) (as illustrated in Figure 9). The first step was to determine the significance of the indirect effects. This was done through applying bootstrap re-sampling routines (e.g. 1000) to test the significance of the indirect effect of an independent variable on a dependent variable through an intervening variable. The path coefficient of the indirect effect is the product of the path coefficient of the

link between the independent variable and the intervening variable (a) and that of the link between the intervening variable and the dependent variable (b): i.e.  $a \times b$ . The significance of the indirect effect was assessed through bootstrap confidence intervals. As shown in Figure 9, if the indirect effect is significant, the left side of the diagram is used to test for mediation, but if the indirect effect is not significant, there is no mediation, as on the right side of the diagram.

The second step was to determine the type of effect and/ or mediation. Mediation effects exist only when the indirect effect ( $a \times b$ ) is significant. The literature consulted discussed two main types of mediation: full and partial. Full mediation is determined if the direct effect is not significant, while the indirect effect is significant. Partial mediation, however, exists when both the direct and indirect effects are significant (Zhao et al., 2010).

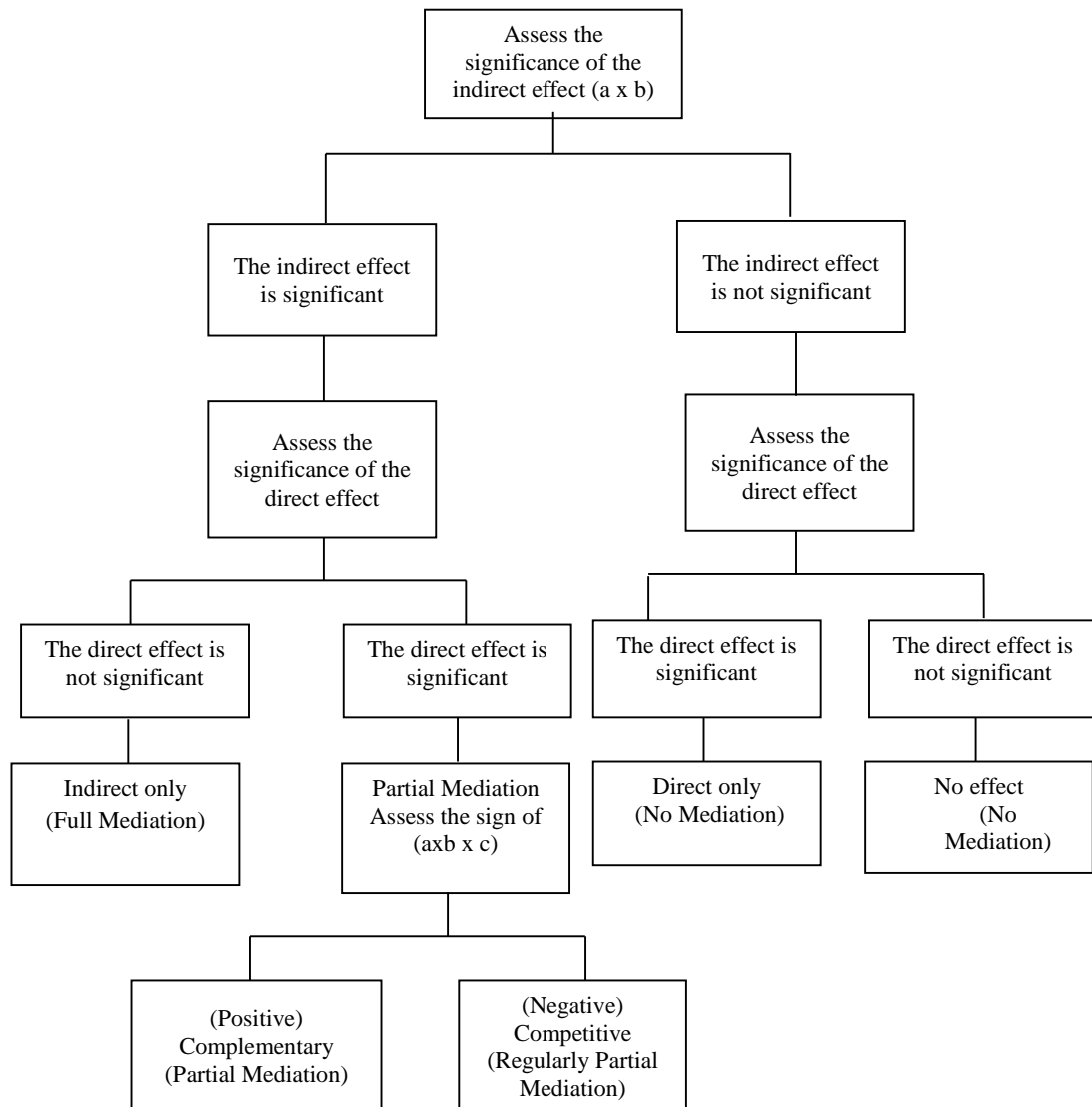


Figure 9: Mediator Analysis Procedures in PLS  
(Source: Zhao et al., 2010)

I estimated the indirect effect of EIMC on SCA through KM as the product of the path coefficient of the direct relationship between EIMC and KM, and that of the direct relationship between KM and SCA. This yielded a path coefficient of 0.2098. The same approach was used to estimate the indirect effect of EIMC and SCA through TQM, and the indirect effect of EIMC and SCA through KM and TQM. These yielded path coefficients of 0.0760 and 0.0762 respectively. I assessed the significance of the indirect effect using bootstrap re-sampling results for the path coefficients of each

direct relationship to approximate a sampling distribution for the indirect effect (Hayes, 2009). Then I generated a confidence interval (99% and 95% confidence) from this distribution with a lower and upper boundary. These intervals showed that the indirect effects were not zero: thus, all the indirect effects were significant (see Table 26 below). This empirically supports hypotheses 7, 8, and 9.

Table 26: PLS Structural Model Results (indirect effects)

<b>Indirect (Mediated) Effects – Path Coefficient and Bootstrap Confidence Interval</b>					
Latent Construct	Mediators	Path to SCA			
		Indirect Path Coefficient	Symbol	Bootstrap Confidence Interval	
				Lower	Upper
EIMC	KM	0.2098	a x b	0.0724 **	0.3868 **
EIMC	TQM	0.0760	c x d	0.0147 *	0.16857 *
EIMC	KM and TQM	0.0762	a x e x d	0.0177 *	0.14601 *
<b>n=144, * 95% confidence, ** 99% confidence</b>					

As all indirect effects are significant, I proceeded to qualitatively support the mediation hypotheses (H7, H8, and H9) based on the interview data.

#### 5.4.2.1 Hypothesis 7

In section 5.4.1, I found support for the direct positive relationship between EIMC and SCA (Hypothesis 1). Hypothesis 7 argues that the relationship between enterprise information management capability (EIMC) and sustainable competitive advantage (SCA) is mediated by total quality management (TQM). To test this mediation effect, I assessed the significance of the indirect effect in addition to the direct effect. Table 26 above shows a positive indirect path coefficient of 0.0760 (with

a 95% Bootstrap confidence interval) from EIMC to SCA (through TQM), and this indicates that this indirect effect is significant. Given that the direct relationship between EIMC and SCA is significant and the indirect effect through TQM is significant, I concluded that the relationship between the extent of enterprise information management capability (EIMC) and sustainable competitive advantage (SCA) is partially mediated by total quality management (TQM). Hypothesis 7 was therefore supported.

As well as that, the quantitative results above have supported this hypothesis; the qualitative interview data provided additional support to it. As noted in Chapter 3, in order to achieve SCA, TQM is considered as a prerequisite because it covers all aspects of the organization: the human, financial, customer management and partnership/supplier development, strategic planning, communication and process management aspects. These elements are also considered essential for SCA. For TQM to fulfill its role, it requires information integration, configuration, and the gaining and releasing information capabilities that the EIMC provides through such initiatives as data warehousing, business intelligence, and enterprise content management, together with the information lifecycle management activities embedded with them. The interview data supports the idea that SCA is influenced by EIMC through TQM. For example, A. M. a senior data management expert from Company A in the logistics industry indicated the indirect ties between the extent of EIMC and SCA (through TQM). One of the main mandates on his company is to manage the performance of the sector's infrastructure development projects. Since the quality of a project is one of the most important measures of the project's performance, meeting and sustaining the quality targets of the project is one of the essential requirements of the company. For this purpose (and certain others), the company decided to establish a TQM program

and earn an ISO quality management system certification. They also planned to use this TQM program to gain and sustain a competitive advantage in the marketplace (since they implicitly compete with other organizations in the UAE and the region). One of the perceived barriers to this plan was the lack of integrated and high-quality enterprise information (especially information related to the performance of some infrastructure development projects). For this reason, they started to implement an enterprise information management program to address this so that they can realize their TQM targets and gain competitive advantage.

*Our EIM program also supports our goal of achieving and sustaining superior performance and competing with our industry peers in two ways: first, through supporting our corporate performance management initiatives, and second through supporting our intended TQM program that will also help us to gain competitive advantage in the marketplace such that we can better compete with our industry peers in UAE and the region. So, we have started with uplifting our EIM capability through identifying and acquiring the missing resources and then we established an EIM program to support our corporate performance management and TQM initiatives. We are also planning to attain ISO quality management system certification. The first outcome of our EIM program was an integrated data warehouse subject area that presents a single version of the truth for the capital infrastructure development projects' information. This program enabled us to support our intended goal and sustain a competitive advantage relative to our peers in the industry.*

Manager A. A. from Company C in the investment industry has also indicated the indirect relationship between the extent of EIMC and SCA through TQM, and he acknowledged that the reason for wanting the 'number one' position in the marketplace (SCA) is the ability to build superior human resources (one of the seven TQM dimensions) capable of reading the future from the data from their data monitoring system (EIMC).

*We will develop the round shape experienced people so they will have the political capability, the international exposure, the technical and financial exposure. So, that is what we will develop and that is a great opportunity for us. We usually think out of the box, we usually take what the market is doing and be ahead of these games. So, the potential is great. I think we will maintain our rank as number one or in the top ten companies internationally and locally. And, it comes from our capability of reading the future through data and facts coming from the data monitoring system.*

Several interviewees had the same opinion of themselves and their organizations. As such, both the quantitative and qualitative data supported Hypothesis 7.

#### **5.4.2.2 Hypothesis 8**

In section 5.4.1, I found support for the direct positive relationship between EIMC and SCA (Hypothesis 1). Hypothesis Eight (H8) argues that the relationship between the extent of enterprise information management capability (EIMC) and sustainable competitive advantage (SCA) is mediated by knowledge management (KM). To test this mediation effect, I assessed the significance of the indirect effect in addition to the direct effect. Table 26 above, showed a positive and significant indirect path coefficient of 0.2098 (with a 99% Bootstrap confidence interval) from EIMC to SCA (through KM as a mediator). Given that the direct relationship between EIMC and SCA is significant and the indirect effect through KM is also significant, I can conclude that the relationship between the extent of enterprise information management capability (EIMC) and a sustainable competitive advantage (SCA) is partially mediated by knowledge management (KM). This provides support for Hypothesis 8.



The qualitative interview results also provided additional support for this hypothesis. As in Chapter 3, to have SCA, KM practices such as the use and sharing of knowledge are essential. KM in turn requires EIM capabilities, which contribute to breaking down information silos, increasing transparency, and to leveraging the value of stored information.

The interview data provided support for the view that SCA was influenced by EIMC through KM. For example, Manager M. A. in the tourism and culture industry identified enterprise content management as a knowledge enabler, which creates knowledge and enriches employees and their competencies, which ultimately creates valuable resources to enable the company to better exploit opportunities or neutralize threats (one of the dimensions of SCA).

*Yes, it [enterprise content management] helps you mandate, it help you plan and based on that track performance, enriches employees, knowledge [knowledge management], and information and competencies [competitive advantage] through that [i.e. through enriching knowledge among the other mentioned factors].*

There were similar views held by other interviewees. Overall, both the quantitative and qualitative results provided strong support for Hypothesis 8.

#### **5.4.2.3 Hypothesis 9**

In section 5.4.1., I found support for the direct positive relationship between EIMC and SCA (Hypothesis 1). Hypothesis 9 argues that the relationship between the extent of enterprise information management capability (EIMC) and sustainable competitive advantage (SCA) is serially mediated by knowledge management (KM) and total quality management (TQM). To test this mediation effect, I assessed the

significance of the indirect effect of EIMC on SCA through TQM and KM. Table 26 above shows a positive significant indirect path coefficient of 0.0762 (with a 95% Bootstrap confidence interval) from EIMC to SCA through both KM and TQM. Given that the direct relationship between EIMC and SCA is significant and the indirect effect through both KM and TQM is also significant, I concluded that the relationship between enterprise information management capability (EIMC) and sustainable competitive advantage (SCA) was partially, serially mediated by both knowledge management (KM) and total quality management (TQM). Hypothesis 9 is thus supported.

These quantitative results are also supported by interviewees' comments. For example, a manager M. A. in the tourism and culture industry identified this mediating relationship. In his organization, providing the right advice to investors is a vital measure of company performance. This organization has recognized the importance of acquiring the right information to support its decision-making processes in this area. It started by collecting and storing information in its ECM system. It then recognized the importance of turning this information into knowledge while also retaining and managing the knowledge gained when assessing investment proposals and making decisions about them. As a result, they used the ECM system (an EIMC initiative) for this purpose. The company's knowledge workers then gained more experience from their KM practices and this experience enabled them to conclude that in order to gain the full benefit of this practice, they should enhance the quality of their KM approach through formalizing business processes and enforcing a business processes management initiative (TQM). This example shows how the company's KM practices were empowered through ECM, and it shows also how these KM practices opened the door to the company's knowledge workers to recognize the importance of the role of

business process management (TQM) in augmenting their KM practices in order to satisfy their intended performance targets (SCA). The director said that:

*For example, I might come with a proposal and the way people propose is not necessarily structured. This is happening in any organization; I have a nice idea but I don't come with a box with a ribbon to tell you why we need to do it. So, as manager I can tell you 'Thank you, [but] I don't think this is good.' The process of telling this and making the decision of yes or no, is not captured, so we created a formal process where you have this form, business case, executive brief, economic benefit, issues, where it was used and was successful before, and so [on] .... And, you as manager should look at that and retain the information and your decision should be to retain. Is this [as it] ... exists not necessary? This is what we are trying to create through process management and through ECM or information management. So, you see I am just focusing on your question where you see it impact, it impacts everywhere. Hence, that's why it's important. I saw my colleague in IT developed ECM, we as the one who are leading business process management, we said WAW we are going to work with you guys we will work hand in hand.*

The serial mediation effect of KM and TQM between EIMC and SCA was also recognized by manager A. A. in the investment industry, who identified enterprise content management as important. He first recognized information, and specifically data analysis, as a main enabler in his company's work, and then he linked data analyses to knowledge management. In turn, he linked KM to better performance and consequently to achieving a competitive advantage.

*The information is the backbone of what we do, without information we cannot proceed the work even for one day. So, the information is the stepping stone of whatever we do. So, I don't dare to apply for anything without data analysis, without a reason, why I should go to this direction if I don't have the data. Because I have to make sense to them. Imagine if I don't have a database or record or cannot make sense of the trend that has happened in the previous five to ten years; It [would be] ... like I am going spontaneously.*

*So, any data we have today we call it knowledge management, so maybe we need it any date. We need the data to create a trend and analyze the data, and that can help us to visualize the future.*

*Without those tools we will not be able to understand (KM) where we are today, what we do, we need to do, to improve our performance and how we can have competitive advantages in visualizing the future and spinning all our resources (TQM) these resources, in order to compete and win in the competition*

*On top of that, it gives you the competitive advantage over your competitors because your analysis will give you the tools to visualize the future, so we can understand (KM) what to budget [for] next year. We can understand if we fail or behind what we are lacking of, cash, resources, time (TQM). And that will lead to better planning in the future.*

Other interviewees expressed similar views. Overall, both the quantitative and qualitative results provided strong support for Hypothesis 9.

## **5.5 Summary**

This chapter presented the results obtained from the analysis of the qualitative and quantitative data. The aim of this research has been to examine the relationships between enterprise information management capability and sustainable competitive advantage, and the mediating effects of knowledge management and total quality management. The results revealed that EIMC positively affects SCA, and that their relationship is partially mediated by KM and TQM. In conclusion, all the nine hypotheses of this research were supported.

## **Chapter 6: Discussion and Conclusion**

### **6.1 Introduction**

This chapter summarizes the research objectives and questions, and answers each question based on the research results and in the context of the relevant literature on the subject. It also summarizes the findings, the theoretical and practical contributions of this work, its limitations and suggestions for future research. Furthermore, this chapter provides recommendations for UAE organizations who seek to achieve and sustain a competitive advantage. It ends with a conclusion.

### **6.2 Discussion of Results**

The purpose of this research has been to examine the relationship between enterprise information management capability and sustainable competitive advantage, and to examine whether and how this relationship is mediated by knowledge management and total quality management. A mixed methods design was adopted where both qualitative and quantitative data were collected and analyzed. The findings were used to answer the research questions. Two main research questions were introduced.

1. What is the impact of enterprise information management capability on sustainable competitive advantage?
2. Is the relationship between enterprise information management capability and sustainable competitive advantage mediated by knowledge management and total quality management?

Four sub-questions were designed to answer the two main research questions. Following on from these research questions, nine hypotheses were developed and tested. The following subsections discuss each of the four research questions.

### **6.2.1 Discussion of Research Question 1: Does EIMC Have Direct Positive Relationships with SCA?**

To investigate whether enterprise information management capability has a positive relationship with sustainable competitive advantage, Hypothesis 1 was developed and tested. Hypothesis 1 stated that enterprise information management capability will have a direct positive relationship with sustainable competitive advantage. This hypothesis was based on the findings and arguments of previous studies. The details of these studies were discussed in Chapter 2 (Literature Review). In brief, the literature suggested that there was a direct positive relationship between information management capability and a sustainable competitive advantage. However, some research did not support the existence of this direct relationship. Hypothesis 1 was introduced in Chapter 3 (Theoretical Framework and Hypotheses Development) and the results were reported in Chapter 5 (Analysis and Results). Both the quantitative and qualitative results provided strong support for the hypothesis. Therefore, my study provides evidence to support the argument that enterprise information management capability has a significant positive impact on achieving a sustainable competitive advantage. It is also worth noting that this result is in line with the generally accepted modus operandi of many leading organizations who believe that information is a source of power, and should be recognized as a valuable enterprise asset, and managed accordingly across the whole organization. Such an approach should be harnessed to analytics to deliver and sustain a competitive advantage as well to gain other transformational business benefits. Moreover, many of today's leading

organizations identify themselves as ‘information or data driven’, and to achieve and sustain competitiveness they have relied less on making decisions based on ‘gut feelings’ or ‘common sense’, and instead they use event triggers and harness information to analytics to gain actionable insights.

### **6.2.2 Discussion of Research Question 2: Is the Relationship Between EIMC and SCA Mediated by TQM?**

To investigate if the relationship between enterprise information management capability and sustainable competitive advantage is mediated by total quality management, three hypotheses were developed and tested (Hypotheses 2, 3, & 7). Hypothesis 2 stated that enterprise information management capability has a direct positive relationship with total quality management. Hypothesis 3 stated that total quality management will have a direct positive relationship with sustainable competitive advantage, and Hypothesis 7 stated that the relationship between enterprise information management capability and sustainable competitive advantage is mediated by total quality management. The three hypotheses were developed based on findings from previous studies. The details of these studies were discussed in Chapter 2 (Literature Review). The arguments underlying these hypotheses were presented in Chapter 3 (Theoretical Framework and Hypotheses Development). The results of the hypotheses testing were presented in Chapter 5 (Analysis and Results). Both quantitative and qualitative results provided strong support for these hypotheses. Thus, my study has supported the hypotheses and suggests that the relationship between enterprise information management capability and achieving sustainable competitive advantage is mediated by total quality management.

It is worth mentioning that the results are consistent with the fact that the relationship between enterprise information management capability and sustainable competitive advantage is long-term and indirect. For example, it is well known that companies can penetrate the markets of their competitors if the quality of their products or services is better than those of their competitors (while they have the same or cheaper prices). The ability to provide the right information to the right person at the right time about customer demands enables organizations to improve their products and services to meet those demands to be competitive and timely. Doing so allows organizations to achieve a competitive advantage. They need to sustain their intended quality targets to sustain a competitive advantage.

### **6.2.3 Discussion of Research Question 3: Is the Relationship Between EIMC and SCA Mediated by KM?**

To investigate if the relationship between enterprise information management capability and sustainable competitive advantage is mediated by knowledge management, three hypotheses were developed and tested (Hypotheses 4, 5 & 8). Hypothesis 4 stated that enterprise information management capability has a direct positive relationship with knowledge management. Hypothesis 5 stated that knowledge management has a direct positive relationship with sustainable competitive advantage, and Hypothesis 8 stated that the relationship between enterprise information management capability and sustainable competitive advantage is mediated by knowledge management. These hypotheses were discussed in Chapter 3 (Theoretical Framework and Hypotheses Development), and the results of the hypotheses tests were presented in Chapter 5 (Analysis and Results). The results support the hypotheses and suggest that the relationship between enterprise



information management capability and sustainable competitive advantage is mediated by knowledge management.

The result above is in line with what is known of organizational practice. Organizations have started to exploit enterprise information management initiatives (such as, master data management, data warehousing, business intelligence and enterprise content management) to generate, store, share and use knowledge. This gives the decision-makers the necessary insights about customers, products, processes, and opportunities in order to gain and sustain a competitive advantage.

#### **6.2.4 Discussion of Research Question 4. Is the Relationship Between EIMC and SCA Serially Mediated by KM and TQM?**

To investigate if the relationship between enterprise information management capability and sustainable competitive advantage is serially mediated by knowledge management and total quality management, Hypotheses 9 was developed and tested. Hypothesis 9 stated that the relationship between EIMC and SCA was serially mediated by KM and TQM. This hypothesis was developed based on the findings and arguments of previous studies and is based on previous hypotheses in this study (4, 6, and 7). Hypothesis 4 states that EIMC will have a direct positive relationship with KM. Hypothesis 6 states that knowledge management will have a direct positive relationship with total quality management. Hypothesis 7 states that the relationship between EIMC and SCA is mediated by TQM. The literature provided strong foundations for these hypotheses (see Chapter 2: Literature Review). The full hypotheses were presented in Chapter 3 (Theoretical Framework and Hypotheses Development), and the results were reported in Chapter 5 (Analysis and Results). Both the quantitative and qualitative results provided strong support to these hypotheses

and, in particular, to Hypothesis 9. Thus, the results support the theoretical argument and suggest that the relationship between enterprise information management capability and sustainable competitive advantage is serially mediated by knowledge management and total quality management.

These results are consistent with the business practice of using information to learn and then applying that learning to improve product or service quality and gain a competitive advantage. For example, analyzing information (enterprise information management capability) to understand customer behavior (knowledge management) in order to improve the quality of a product or service (total quality management) and therefore gain a competitive advantage (sustainable competitive advantage).

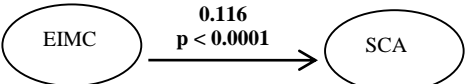
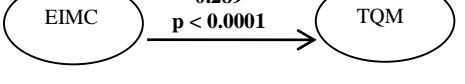
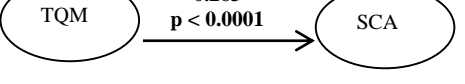
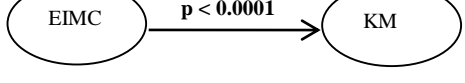
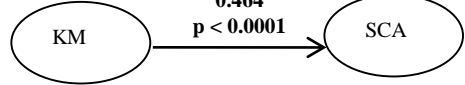
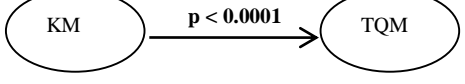
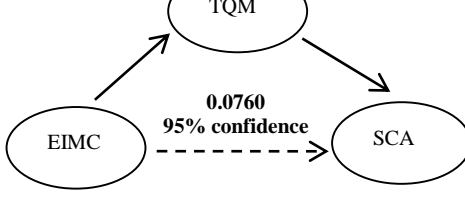
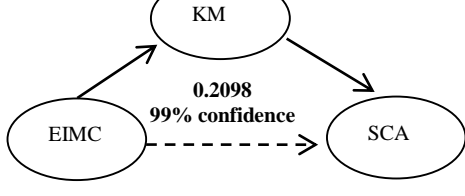
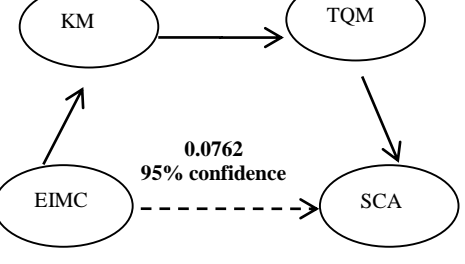
### **6.3 Summary of Findings**

Four constructs were developed, and their interconnections were studied via nine research hypotheses in a structural equation model in order to assess the direct and indirect impact of enterprise information management capability on sustainable competitive advantage. The mediating effects of knowledge management and total quality management, in the relationship between enterprise information management and sustainable competitive advantage, were also examined. Data was collected through 12 semi-structured interviews and 144 surveys of managers in UAE organizations.

A PLS analysis and interview analysis supported the general assumption that enterprise information management capability influences an organizations' sustainable competitive advantage both directly and indirectly. The results also supported the mediating effects of KM and TQM, as well as the serial mediation effect of KM and

TQM together. Overall, this research provides support for the nine hypotheses proposed and for the conceptual model. Table 27 summarizes the test results after hypotheses testing. This study has revealed that a significant positive association exists between enterprise information management capability and sustainable competitive advantage. This finding informs the need for organizations to exploit enterprise information management capabilities as a source of competitive advantage.

Table 27: Summary of Hypotheses Test Results

Hypothesis	Pathway and Results	Hypothesis Supported
H1: Enterprise information management capability and sustainable competitive advantage.		Yes
H2: Enterprise information management capability and a firm's total quality management.		Yes
H3: Total quality management and a firm's sustainable competitive advantage.		Yes
H4: information management capability and a firm's knowledge management.		Yes
H5: Knowledge management and a firm's sustainable competitive advantage.		Yes
H6: Knowledge management and a firm's total quality management		Yes
H7: Mediation effect of a firm's total quality management.		Yes
H8: Mediation effect of a firm's knowledge management.		Yes
H9: Serial mediation effect of knowledge management and total quality management.		Yes

#### **6.4 Theoretical Contributions of the Study**

This study makes a number of theoretical contributions. First, it contributes to information management literature with respect to the business value of information management. Ling et al. (2014) find that information infrastructure capability has the potential to enhance organizational competitive advantage. They call for further studies to examine the relationship between data management capability (or as other researcher have called it, enterprise information management capability) and competitive advantage. This dissertation partly responds to this call by examining the impact of enterprise information management capability on sustainable competitive advantage. By revealing the positive impact of enterprise information management capability on a firm's sustainable competitive advantage, I have added to the literature, which contends that information management has a business value. This dissertation has provided a theoretical path model by which enterprise information management capability contributes to business value through its impact on sustainable competitive advantage.

Second, this study provides insight into the intermediate organizational capabilities that impact the relationship between enterprise information management capability and sustainable competitive advantage. It also agrees with commentators such as Mithas et al. (2011), who have suggested the need to recognize information management capability as an enabler of valuable intermediate organizational capabilities such as customer management, process management, and performance management capabilities, that in turn creates and sustains competitive advantage. Furthermore, Mithas et al. (2011) have criticized studies that exclusively examine the direct link between information management capability and a firm's performance, and

highlight the importance of recognizing the role of the intermediate organizational capabilities in this relationship. I have contributed to this research by examining and finding evidence of the impact of two intermediate organizational capabilities (knowledge management and total quality management) on sustainable competitive advantage. My current research found that knowledge management and total quality management are important intermediate organizational capabilities that mediate the relationships between enterprise information management capability and sustainable competitive advantage.

Third, this study has also contributed to the literature on total quality management. Previous literature focused on the relationship between total quality management and information management at the individual (organizational-unit) level and not at the enterprise-wide level. Given that total quality management adopts a 'whole organization' approach, this study provides a better understanding of the way in which enterprise-wide information management capability affects total quality management.

Fourth, this study also contributes to knowledge management literature such as that by Wang et al. (2007), by casting more light on the role that enterprise information management capability plays in supporting effective knowledge management. For example, while Wang et al. (2007) showed that information technology (a component of enterprise information management dimensions) benefits manufacturing performance in Taiwan, indirectly through its support of knowledge management, this research provides more evidence on the positive impact of the enterprise information management capability (a wider concept than the information technology concept) on

a firm's knowledge management processes and its subsequent sustainable competitive advantage.

Fifth, this study also supports the position that knowledge management contributes positively to total quality management, and, in consequence is in line with the findings of such as Ju et al. (2006). Also the results are in line literature such as Stewart and Waddell (2008), that contend the increasingly dynamic business environment with expected rapid change and altering customer preferences, force organizations to focus on enabling its knowledge management process in order to achieve competitive advantage through providing quality in a holistic approach (more than product/service quality).

Finally, although the issue of enterprise information management capability has recently received greater attention from scholars (e.g. Hausmann et al. 2014; Young, 2015) and practitioners (e.g. White, 2015; Rashkino & Logan, 2012; Newman & Logan, 2006), this study is one of the first studies that examines the role of enterprise information management capability in the context of knowledge management, total quality management and sustainable competitive advantage. Therefore, my study contributes to enterprise information management literature by demonstrating that enterprise information management capability is a dynamic capability that can be exploited for significant organizational benefits and for superior organizational performance.

### **6.5 Practical Contributions of the Study**

This study makes a contribution to business practices. Although many organizations have identified the growing importance of the role of sustainable

competitive advantage as an important strategic management issue (Rahimli, 2012) in a turbulent business environment (Schaltegger & Wagner, 2006), and although these organizations have invested substantially in developing and implementing information management systems to support sustainable competitive advantage, not all of them get the benefits that they expect. Several factors may account for this, such as not recognizing the direct and indirect impact of enterprise information management capability on sustainable competitive advantage. My study provides a model that highlights the impact of enterprise information management on sustainable competitive advantage, and demonstrates the practical significance of enterprise information management capability, knowledge management, and total quality management. This finding can help organizations to implement a more holistic approach to exploiting their information management capability for relatively superior performance. This should encourage organizational decision makers to invest in enterprise information management capabilities in order to empower their firm's knowledge management and total quality management, and to ultimately achieve and sustain a competitive advantage.

## **6.6 Limitations and Suggestions for Future Research**

Every effort was made at each stage of this study to obtain reliable and valid findings. Although this study has successfully achieved its set objectives, the results need to be interpreted in the light of some limitations. Firstly, the findings are based on mixed methods research (involving self-reported survey data and qualitative interview data) so this study overcomes the shortfall of having a single research method (either quantitative or qualitative). Nevertheless, the data collection process (qualitative data first via interviews and quantitative data second, through online



questionnaires), limited me from fine-tuning and altering the interview questions in light of the results of the survey. An alternative sequence (surveys followed by interviews) would have allowed me to come up with more focused questions and possibly to have elicited more focused answers to clarify the mechanisms underlying the direct and the indirect relationships between enterprise information management capability and sustainable competitive advantage. If so, the research design might have benefited from better and more focused interview questions.

Secondly, while my response rate and sample size were acceptable, my study would have benefited from a stronger response from both the survey and the interview participants. Although the sample size was adequate for testing my hypotheses, it limits the extent to which my results can be generalized and extrapolated to a larger population.

Third, when developing the questionnaire, I faced no difficulty in selecting measurement items to measure sustainable competitive advantage, total quality management and knowledge management, as there are several well-cited, reliable and valid measures for these constructs in the literature. This was not the case, however, when it came to selecting survey items for enterprise information management capability. The enterprise information management capability scale adapted in this study was the only one I could find, and it had only been cited eight times according to [google.ae/scholar](https://www.google.ae/scholar). I see this as a concern, although not a serious one, because I was satisfied with the reliability and validity of the measurement items, and I believe that the measures covered all the dimensions of enterprise information management capability. Future research would benefit if a variety of survey tools were available.

I would encourage future researchers and practitioners to extend my study in a number of ways. First, future research can extend the current study by further critiquing, investigating and expanding the proposed model. Additionally, future research can extend the proposed model by examining other mediators between enterprise information management capability and sustainable competitive advantage. Also it worth mentioning here, that though I investigated the effect of KM on TQM, this does not eliminate the possibility that TQM may be an antecedent to KM. Future research may investigate the alternative proposition. Beside the above, I used individual informant to answer questions on behalf their organizations, thus, future research could consider using multiple informants per organization and using the average of their responses to represent the organizational response. Finally, given that data was collected in a specific context and locale (that of UAE businesses), future research may want to test the hypotheses of the present study in a different context or even in a more specific domains in the present context (for example, in the oil and gas industries, IT, finance, etc.)

### **6.7 Recommendations for UAE Organizations**

One of the intentional benefits of this research was to support UAE organizations and to foster their SCA. As previously explained in Section 1.6.1, the government of the UAE took the major initiative of confronting both current and imminent economic challenges by encouraging UAE organizations to achieve superior performance. By establishing such institutes and organizations as the Sheikh Khalifa Excellence Award (SKEA) and the Dubai Quality award (DQA). Both institutes have adopted the European Foundation for Quality Management Excellence Model (EFQM Excellence Model) as a TQM framework for UAE organizations. The EFQM

framework addresses both information management and knowledge management aspects in many parts of its enabler criteria and enabler guidance points, as illustrated in Chapter 2 (Literature Review). It is to be hoped that the following recommendations can help UAE organizations to benefit from the EFQM framework by leveraging the organizations' enterprise information management capability and knowledge management processes.

From an information management perspective and to facilitate the use of the EFQM framework, I recommend that UAE organizations should apply the EFQM enabler criteria part 4.e. to manage information that supports effective decision making through building a comprehensive enterprise information management capability that spans all the three EIMC dimensions. This can be achieved by:

- The establishment of an enterprise information management framework that addresses seven components: vision, strategy, metrics, information governance, organization and roles as well as information lifecycle management.
- Establish an enterprise information management program that covers enterprise information management initiatives relevant to an organization's business objectives. Typical enterprise information management initiatives include business intelligence, enterprise or corporate performance management, enterprise content management or web content management, record management, e-discovery, application integration/ data integration, data warehousing or establishing a data lake, real time operational intelligence and big data analytics, open data or linked data, application consolidation/migration, master data management and meta data management.

- Extension of the governance structure of enterprise information management initiatives across various information domains, or types of data, (for instance, social data, operational data, content, analytic data, master data, etc.), each of which has its own set of applications, standards, practices and uses.

Table 28 below shows how enterprise information management initiatives can be leveraged to support different EFQM enabler guidance points:

Table 28: EFQM Enabler and Supporting EIM Initiatives

<b>EFQM Enabler Guidance Point</b>	<b>Examples of Supporting EIM Initiative</b>
Ensure that organization leaders are provided with <b>accurate</b> and <b>sufficient</b> information to support them in <b>timely</b> decision-making. <b>(EFQM 4.e)</b>	<ul style="list-style-type: none"> <li>- Analytics: BI, Real Time Operational Intelligence &amp; Big Data and Analytics</li> <li>- Master Data Management (MDM)</li> <li>- Enterprise Content Management (ECM)</li> <li>- Record Management (RM)</li> <li>- Data Warehousing</li> </ul>
Transform <b>data into information</b> and where relevant into <b>knowledge</b> that can be <b>shared</b> and effectively used. <b>(EFQM 4.e)</b>	<ul style="list-style-type: none"> <li>- Analytics: BI, Real Time Operational Intelligence &amp; Big Data and Analytics</li> <li>- Data Warehousing</li> <li>- Knowledge Sharing Portals</li> <li>- Enterprise Content Management</li> </ul>
Establish approaches to engage relevant stakeholders and use their collective knowledge in generating ideas and innovation. <b>(EFQM 4.e)</b>	<ul style="list-style-type: none"> <li>- Knowledge Sharing Portals</li> <li>- Analytics</li> <li>- ECM</li> <li>- CPM</li> <li>- Data Warehousing</li> <li>- Open Data or Linked Data</li> <li>- Expert Systems</li> </ul>
<b>Provide and monitor access</b> to relevant information and knowledge for their people and external users, whilst ensuring both <b>security</b> and the organisation's intellectual property are protected. <b>(EFQM 4.e)</b>	<ul style="list-style-type: none"> <li>- Information Governance Tools</li> <li>- ILM</li> <li>- Analytics</li> <li>- MDM</li> <li>- ECM</li> <li>- Record Management</li> <li>- Data Warehousing</li> <li>- Expert Systems</li> </ul>
Establish and manage <b>learning and collaboration</b> networks to identify <b>opportunities</b> for creativity, innovation and improvement. <b>(EFQM 4.e)</b>	<ul style="list-style-type: none"> <li>- BI and Analytics (e.g. Social SW Content Analytics/ BI Platform Collaboration Capabilities)</li> <li>- Knowledge Sharing Portals</li> <li>- CPM</li> </ul>

Table 28: EFQM Enabler and Supporting EIM Initiatives (Continued)

<b>EFQM Enabler Guidance Point</b>	<b>Examples of Supporting EIM Initiative</b>
Transform ideas into reality within timescales that maximise the advantages that can be gained. <b>(EFQM 4.e)</b>	<ul style="list-style-type: none"> <li>- Analytics: BI, Operational Intelligence &amp; Big Data and Analytics</li> <li>- CPM</li> <li>- Knowledge Sharing Portals</li> </ul>
Manage a technology portfolio that supports the organisation's overall strategy. <b>(EFQM 4.d)</b>	<ul style="list-style-type: none"> <li>- All EIM Initiatives: Technology Platform Standards and Strategy</li> </ul>
Evaluate and develop the technology portfolio to improve the agility of processes, projects and the organisation. <b>(EFQM 4.d)</b>	<ul style="list-style-type: none"> <li>- Business Process Management suites</li> <li>- Portfolio, Program and Project management applications</li> <li>- All EIM Initiatives: Technology Platform Standards and Strategy that improve agility (e.g. virtualization and cloud computing)</li> </ul>
Involve relevant stakeholders in the development and deployment of new technologies to maximise the benefits generated. <b>(EFQM 4.d)</b>	<ul style="list-style-type: none"> <li>- All EIM Initiatives: EIM Strategy should include active participation by business managers, visionary staff from relevant business and technology organizational units.</li> </ul>
Identify and evaluate alternative and emerging technologies in the light of their impact on organisational performance and capabilities and the environment. <b>(EFQM 4.d)</b>	<ul style="list-style-type: none"> <li>- All EIM Initiatives: EIM leaders encourage the enterprise to identify and evaluate such technologies.</li> </ul>
Use technology to support the culture of creativity and innovation. <b>(EFQM 4.d)</b>	<ul style="list-style-type: none"> <li>- All EIM Initiatives: EIM leaders encourage the enterprise to use such technologies.</li> </ul>

From a knowledge management perspective and to foster the EFQM framework I recommend that UAE organizations should make use of the full set of KM dimensions, namely:

- Knowledge Creation
- Knowledge Storage
- Knowledge Transfer
- Knowledge Applications and Use

Table 29 shows examples of knowledge management dimensions that can be leveraged to support the EFQM enabler guidance points, and in turn, their corresponding EFQM enabler criteria part, and in turn, their EFQM enabler criterion (as shown by the arrows shown in the table):

Table 29: EFQM Enablers and Associated KM Dimension

<b>EFQM Enabler Criterion</b>	<b>EFQM Enabler Criterion Part</b> ←	<b>EFQM Enabler Guidance Point</b> ←	<b>KM Dimension</b> ←
<b>1- Leadership</b>	1b. Leaders define, monitor, review and drive the improvement of the organisation's management system and performance.	Base decisions on factually reliable information and use all available knowledge to interpret current and predicted performance of the relevant processes.	- application and use of knowledge
	1e. Leaders ensure that the organisation is flexible and manages change effectively.	Demonstrate ability to make sound, timely decisions, based on available information, previous experience and knowledge, with consideration of their potential impact.	- application and use of knowledge

Table 29: EFQM Enablers and Associated KM Dimension (Continued)

EFQM Enabler Criterion	EFQM Enabler Criterion Part ←	EFQM Enabler Guidance Point ←	KM Dimension ←
<b>3- People</b>	3d. People communicate effectively throughout the organisation.	Enable and encourage the sharing of information, knowledge and best practices, achieving a dialogue throughout the organisation.	- transferring knowledge
<b>4- Partnerships &amp; Resources</b>	4a. Partners and suppliers are managed for sustainable benefit.	Work together with partners to achieve mutual benefit and enhanced value for their respective stakeholders, supporting one another with expertise, resources and knowledge.	- transferring knowledge
	4.e. Information and knowledge are managed to support effective decision making and to build the organisation's capability	Transform <b>data into information</b> and where relevant into <b>knowledge</b> that can be <b>shared</b> and effectively used.	- transferring knowledge
		Establish approaches to engage relevant stakeholders and use their collective knowledge in generating ideas and innovation.	- Knowledge creation - transferring knowledge
		<b>Provide and monitor access</b> to relevant information and knowledge for their people and external users, whilst ensuring both <b>security</b> and the organisation's intellectual property are protected	- Storing knowledge - transferring knowledge
<b>9. Business Results</b>	9b. Business Performance Indicators	Introduce performance indicators on Technology, information and knowledge	- Storing knowledge and transferring knowledge; - knowledge creation - application and use of knowledge



In brief, the key recommendations that emerged from this research are grounded in the significant impact of enterprise information management capability on sustainable competitive advantage, knowledge management and total quality management (see Figure 10). Consequently, UAE organizations are advised to invest time and money in this emerging capability.

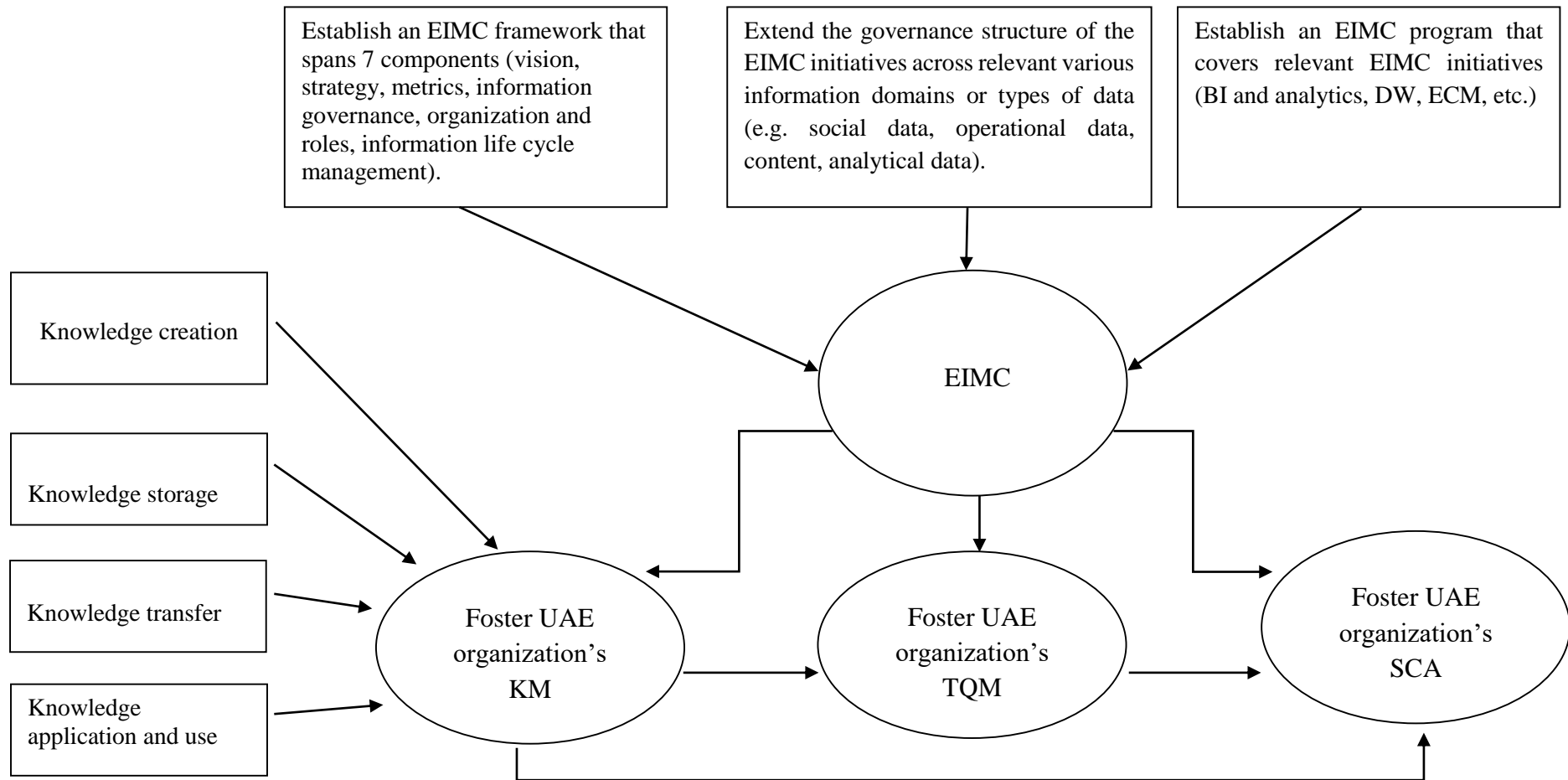


Figure 10: EIMC Framework

## 6.8 Conclusion

The current competitive business environment has brought about the need to assess the role of enterprise information management capability in achieving a sustainable competitive advantage, and to learn about its impact on knowledge management and total quality management, the two main management disciplines that organizations use to achieve a sustainable competitive advantage. The findings reported in this study suggest the need for decision-makers to recognize that enterprise information management capability plays a different and more important role in organizations, and requires the proper investment and use to realize its benefits. This research has also demonstrated how Dynamic Capability Theory can be adopted and used in the area of enterprise information management capability. Moreover, the research has demonstrated that Dynamic Capability Theory sheds more light on how enterprise information management capability acts as an enabler, not only for sustainable competitive advantage, but also for vital business processes and practices, specifically knowledge management and total quality management.

Several potential applications of this research, the research limitation and proposed future research have been discussed in this chapter. In conclusion, this research has provided some useful insights into the currently underestimated capacity of enterprise information management capability (EIMC). I hope and expect the findings of this study will help UAE organizations to become more dynamic entities and to make more informed strategic decisions to achieve a sustainable competitive advantage. I also hope that this study will draw attention to this capability and act as a catalyst for ongoing and future research into it.

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## Appendices

### Appendix A: Interview Consent

You are invited to participate in an academic study titled (The Impact of Enterprise Information Management Capability on Sustainable Competitive Advantage).

Enterprise Information Management strategies are the evolution of traditional information management practices due to the explosion of data and the rise of the Information Enterprise. It specializes in finding solutions for optimal use of information within organizations, for instance to support decision-making processes or day-to-day operations that require the availability of knowledge. It tries to overcome traditional IT-related barriers to managing information at an enterprise level.

We are interested in understanding how EIMC influences or affects organization's sustainable competitive advantage. As a senior manager or a manager in Information Technology, Knowledge Management, Total Quality Management or Performance Management, you have a vital role to play in improving our understanding of EIMC impacts on SCA, KM and TQM. Answers to the attached questionnaire will help us in developing a model that will better serve the Information Management, KM, and TQM needs of your organization and other organizations.

The direct benefit for you is that you will receive a confidential report on the study finding, which your contribution plays a major role in it.

The university has a policy to protect people we interview, and obliged us to sign on consent form that informs you as a participant about the level of safety and confidentiality that your information will be treated with.

#### **Safety Information**

Your participation does not involve any risks other than what would encounter in daily life.

As in all social science research, there is a small, but quite minimal, risk of confidentiality risk. We minimize it by strict procedures on collecting, transferring and storing the data. All collected interview results will be stored in secure location. All data will be coded under random identifier numbers. A separate file linking identifier and names will be kept in the safe. When the need for the interview data is no more exist, researcher will destruct all information by deleting all related documents saved in researcher's computer and any back up devices.

#### **Confidentiality and Privacy Information**

Any information obtained from this interview will be treated in strict confidence and will be used solely for the purposes of this project. Please be assured that the information you provide in this interview will not be distributed to any third parties. Your responses

to this interview are anonymous, and the interview are not labeled so they cannot be traced to any individual.

### **Right to Withdraw**

Although your responses to this interview would be greatly valued, your participation is voluntary.

Two copies of consent forms to be signed by me and you.

I agree to participate

Participant signature

Hayfa Bu Hazzaa

**College of Business and Economics**

United Arab Emirates University

Al Ain

**Email: [200170229@uaeu.ac.ae](mailto:200170229@uaeu.ac.ae)**

**Signature**

## Appendix B: Interview Questions

### Enterprise Information Management Capability

EIM is an integrated discipline for structuring, describing and governing information assets, regardless of organizational and technological boundaries, to improve operational efficiency, promote transparency and enable business insight (ex: Data warehousing, BI, Enterprise content management, Information/Data Governance)

Q1. Do you see this applied in your organization? And how its work?

Q2. How your organization's enterprise information management empowers your business capabilities? (EIMC1-EIMC8)

The following are examples:

- Regulatory compliance
- Access critical information when needed
- Information governance
- Share data (internally and externally)
- Business improvement
- Analyze data to support decision

Q3. How you see EIM empower the business capability like complying with Regulation.

### Total Quality Management

TQM as a holistic philosophy that aims to continuously improve all organization's functions to meet the satisfaction of everyone associated with the organization (e.g. employees, customers and suppliers).

Q1. How your organizations senior management support quality (example to prompt if not covered the following: leadership, vision, recognition, support training) (TQM1, TQM2, TQM3, TQM4)

Q2. What is the effect of the customers and suppliers feedback on your quality? (TQM5, TQM6, TQM7, TQM8)

Q3. To what extent your process standardized and communicated to the employees (TQM9,TQM10)

Q4. Your feedback about your workspace ambiance (organized, cleaned) (TQM11)

Q5. What is the procedure before producing new services/products (TQM12)

Q6. How effective is the collaboration between different teams? (TQM13)

Q7. What is the role that information plays in managing the business performance (including service and products quality) (TQM14, TQM15, TQM16)

### **Knowledge Management**

Knowledge Management (KM) is defined as “a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities such as problem solving, dynamic learning, strategic planning and decision-making”

Q1. What are the knowledge management practices in your organizations?(acquire new knowledge, motivate new knowledge, generates new knowledge, organize, distribute, store, retrieve, apply, protect knowledge) (KM1-KM8)

Q2.Can you give me some of examples of the rules of conduct regarding knowledge in your organization? (KM9, KM10, KM11)

### **Sustainable Competitive Advantage**

(SCA) refers to the ability of an organization to achieve superior performance relative to you competitors

Q1. What are the key capabilities/resources that present competitive advantages for your organization? And why you consider them as key capabilities (only if he/she did not covered I need to prompt to main characteristics: valuable/costly to imitate/difficult to substitute) (SCA1, SCA2, SCA3)

Q2. How do you see your organization position amongst competitors with reference to market return? (SCA4)

Q3. What is your perception of your organization business performance in the short and long terms? (SCA5)

### Appendix C: Data Coding

Category	Code
EIMC/ Dimension	<ul style="list-style-type: none"> <li>▪ EIMC Framework (Vision, Strategy, Metrics, Information governance, Organization and roles, ILM, Enabling infrastructure)</li> <li>▪ EIMC Initiative (BI and analytics, Enterprise performance management, Enterprise content management, Records management, E-discovery, Application integration or data integration, Data warehousing or data lake, Open data or linked data, Application consolidation or migration)</li> <li>▪ Information Domain (Content, Master Data, Operational Data, Social Data)</li> </ul>
EIMC/ Effect	<ul style="list-style-type: none"> <li>▪ Better Support of Business Excellence (TQM)</li> <li>▪ Supports KM (KM)</li> <li>▪ Enhances other organizational capabilities and thus positively affects firm performance. (SCA)</li> <li>▪ Improve organizational effectiveness (SCA)</li> <li>▪ Enables both IT and business agility and adaptability (SCA)</li> <li>▪ Achieving a holistic picture of risk, and achieving progress in relation to compliance with legislation and regulation (SCA)</li> </ul>
KM/ Antecedent	<ul style="list-style-type: none"> <li>▪ EIM</li> <li>▪ Taxonomy tools</li> <li>▪ Document management</li> <li>▪ Data warehouse</li> <li>▪ Database</li> <li>▪ Expert systems &amp; Machine learning</li> <li>▪ IT that is utilized in information search and discovery</li> <li>▪ The intranet</li> <li>▪ Collaboration tools</li> </ul>
KM/ Dimension	<ul style="list-style-type: none"> <li>▪ knowledge creation</li> <li>▪ Knowledge storage</li> <li>▪ knowledge transfer</li> <li>▪ knowledge application and use</li> </ul>
KM/ Effect	<ul style="list-style-type: none"> <li>▪ Enhancing performance</li> <li>▪ Innovation</li> <li>▪ Protect Intellectual Property</li> <li>▪ Enhance organization dynamic capability</li> </ul>
TQM/ Antecedent	<ul style="list-style-type: none"> <li>▪ IM capability</li> <li>▪ Data</li> <li>▪ Information technology</li> <li>▪ Information Systems</li> <li>▪ Analytics</li> <li>▪ Decision support system</li> </ul>

Category	Code
TQM/Dimension	<ul style="list-style-type: none"> <li>▪ Leadership &amp; management commitment</li> <li>▪ Customers' management</li> <li>▪ Strategic planning &amp; development</li> <li>▪ Partnership &amp; resources</li> <li>▪ People management</li> <li>▪ Process management</li> <li>▪ Information management and analysis</li> </ul>
TQM/Effect	<ul style="list-style-type: none"> <li>▪ Customer Satisfaction</li> <li>▪ Cost Reduction</li> <li>▪ Enhance output Quality</li> <li>▪ Promote Performance</li> </ul>
SCA/Antecedent	<ul style="list-style-type: none"> <li>▪ Information</li> <li>▪ Information Management Capability</li> <li>▪ EIM</li> </ul>
SCA/Dimension	<ul style="list-style-type: none"> <li>▪ Having VALUABLE resources or capabilities that enable organization to exploit opportunities or neutralize threats</li> <li>▪ Having RARE resources or capabilities that are not possessed by the most of the organization competitors</li> <li>▪ Having COSTLY-TO-IMITATE resources or capabilities, that organization's competitors cannot easily imitate or develop.</li> <li>▪ Having DIFFICULT-TO-SUBSTITUTE resources or capabilities that cannot be easily substituted by those of organization's competitors</li> <li>▪ Having shown PERSISTENT superior business performance to organization's competitors for a long time.</li> <li>▪ Having the ability to mainly produce ABOVE average market return by the organization.</li> </ul>
SCA/Effect	<ul style="list-style-type: none"> <li>▪ Sustained superior long-term performance</li> <li>▪ Excellent business</li> <li>▪ Better products</li> <li>▪ Cheaper products</li> <li>▪ Delivering faster execution</li> <li>▪ Being more reliable</li> </ul>



## Appendix D: Invitation Email

**Subject: A Study of the Impact of Enterprise Information Management Capability on Sustainable Competitive Advantage**

**Dear Participant,**

Greetings,

We would like to invite you to participate in an academic study that examines the relationship between Enterprise Information Management Capability (EIMC) and Sustainable Competitive Advantage (SCA), being conducted by Mrs. Hayfa Bu Hazzaa, DBA Candidate at the University of UAE. (Faculty Advisor: Professor Habib Mahama). We believe that your response will be part of ongoing effort to develop model that should assist managers in understanding the role of EIMC as an organizational capabilities that facilitates and enhances Total Quality Management, Knowledge Management and firm performance. Thus we would like to hear your experience in your organization.

we would provide you with a copy of the aggregated final study results. So if you would like to receive this report, please note your email address on the last page of the survey.

**To participate in the survey, click on the follow link:  
{Take the survey}**

**Or copy and paste the URL below into your internet browser:  
{http://SurveyURL}**

Any information obtained from this questionnaire will be treated in strict confidence and will be used solely for the purposes of this study. Please be assured that the information you provide in this questionnaire will not be distributed to any third parties. Your responses to this questionnaire are anonymous, and the questionnaires are not labelled so they cannot be traced to any individual.

If you have any questions regarding the survey please contact Hayfa Mohamed Ali Mohamed Bu Hazzaa on 200170229@uaeu.ac.ae, or Dr. Habib Mahama on habib.mahama@uaeu.ac.ae.

This research has been reviewed and approved by UAEU social science research ethics committee.

*Thank you in advance for your time and thoughtful responses*

Hayfa Bu Hazzaa

Prof. Habib Mahama

College of Business and Economics

College of Business and Economics

United Arab Emirates University

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Al Ain

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Email: [200170229@uaeu.ac.ae](mailto:200170229@uaeu.ac.ae)

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## Appendix E: Survey Instrument



10 May 2016

Dear Sir/Madam,

### **A study of the impact of enterprise information management capability on sustainable competitive advantage**

You are invited to participate in an academic study that examines the relationship between Enterprise Information Management Capability (EIMC) and Sustainable Competitive Advantage (SCA) either directly, or indirectly through organization's Total Quality Management (TQM) and Knowledge Management (KM) practices. If you agree, you will be asked to fill in a questionnaire that should take no more than 30 minutes of your time.

#### **THE STUDY**

We are interested in understanding how EIMC influences or affects organization's sustainable competitive advantage. As a senior manager or a manager in Information Technology, Knowledge Management, Total Quality Management or Performance Management, you have a vital role to play in improving our understanding of EIMC impacts on SCA, KM and TQM. Answers to the attached questionnaire will help us in developing a model that will better serve the Information Management, KM, and TQM needs of your organization and other organizations.

Please answer the attached questions **independently** of anyone else whom you know may have received the questionnaire. It is important that you complete all questions. After completing the questionnaire, please return/submit it to me. It would be highly appreciated if this can be done within two weeks of receiving the questionnaire.

#### **CONFIDENTIALITY AND ETHICS**

Any information obtained from this questionnaire will be treated in **strict confidence** and will be used solely for the purposes of this project. Please be

assured that the information you provide in this questionnaire will not be distributed to any third parties. Your responses to this questionnaire are anonymous, and the questionnaires are not labelled so they cannot be traced to any individual.

Should you have questions regarding the study or content of the questionnaire, please do not hesitate to contact **Hayfa Mohamed Ali Mohamed Bu Hazzaa** on **200170229@uaeu.ac.ae**, or **Dr. Habib Mahama** on **habib.mahama@uaeu.ac.ae**. If you require summarized results of this study, please send a separate email to 200170229@uaeu.ac.ae

Thank you very much for your contribution to this important research.

Yours sincerely,

Hayfa Mohamed Ali Bu Hazzaa

(Student ID No. 200170229)

#### FOR YOUR INFORMATION

Thank you for taking the time to complete this questionnaire. Although your responses to this questionnaire would be greatly valued, your participation is voluntary. Completion and return of this questionnaire will be regarded as consent.

If you have any questions regarding ethical aspects of this research, you may contact either:

Hayfa Bu Hazzaa

**College of Business and Economics**

United Arab Emirates University

Al Ain

**Email: 200170229@uaeu.ac.ae**

Dr. Habib Mahama

**College of Business and Economics**

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**Email: habib.mahama@uaeu.ac.ae**

## SECTION A

### INSTRUCTIONS

In this questionnaire, we are interested in understanding how EIMC influences or affects organization's sustainable competitive advantage. Though you may feel that it is difficult to generalize, we would like you to answer the questions as accurately as you can. There are no right or wrong answers.

### Definitions of Terms

**Enterprise information management capability (EIMC)** is the strategic application of EIM competences to generate business value and differentiation. EIMC reflects the ability and commitment of organization to effectively manage its information assets enterprise-wide.

**Knowledge management** is a process that helps organizations find, select, organize, disseminate, and transfer important information and expertise necessary for activities, such as problem solving, dynamic learning, strategic planning, and decision-making. Knowledge management processes include knowledge acquiring and creation, knowledge capturing and storage, knowledge dissemination and transfer, and knowledge application.

**Total Quality Management (TQM)** is a holistic management philosophy aiming at continuous improvement in all functions of an organization to produce and deliver commodities or services in line with customers' needs or requirements by better, cheaper, faster, safer, easier processing than competitors with the participation of all employees under the leadership of top management

**Sustainable Competitive Advantage (SCA)** refers to the ability of an organization to achieve superior performance relative to you competitors

## SECTION B

### Enterprise Information Management Capability

For each of the following questions, please tick the box on the scale that best corresponds to your understanding.

1 = Strongly Disagree: 2 = Disagree: 3 = Slightly Disagree; 4 = Neither Agree nor Disagree; 5 = Slightly Agree: 6 = Agree: 7 = Strongly Agree

No	To what extent is your organization's enterprise information management providing you with the capability to:	Not at All                      Neither Agree nor Disagree                      To great extent						
		1	2	3	4	5	6	7
1	Meet regulatory compliance requirements.							
2	Access to critical business information when it is needed.							
3	Achieve information governance.							
4	Integrate and share information externally with customers, suppliers, and business partners.							
5	Integrate and share information internally between departments.							
6	Create value from business information (such as improvements in quality, customer service, and new product development).							
7	Manage the cost of collecting, storing, and securing information throughout its lifecycle from creation to destruction.							
8	Use information assets to provide business intelligence.							

## Total Quality Management

Please tick the box on the scale that measures the extent to which you agree or disagree with the following statements in your organization:

No	Statements	Not at All      Neither Agree nor Disagree      To great extent						
		1	2	3	4	5	6	7
1	Our top management provides personal leadership for quality products and quality improvement.							
2	Our top management creates and communicates a vision focused on quality improvement							
3	Employees receive quality-related training.							
4	Employees are recognized and rewarded for superior quality improvement.							
5	Customer complaints are used as a method to initiate improvements in our current processes.							
6	Our customers give us feedback on our quality and delivery performance.							
7	We actively engage suppliers in our quality improvement efforts.							
8	We maintain close communication with suppliers about quality considerations and design changes.							
9	Clear work or process instructions are given to employees.							

No	Statements	Not at All			Neither Agree nor Disagree		To great extent	
		1	2	3	4	5	6	7
10	We make extensive use of statistical techniques to reduce variance in processes							
11	Our plant/shop floor is kept clean at all times.							
12	We thoroughly review new product/service design before the product/service is produced.							
13	We work in teams, with members from a variety of areas (marketing, purchasing, manufacturing, etc.) to introduce new products/services.							
14	Information on quality performance is readily available to employees.							
15	Our quality data (error rates, defect rates, scrap, etc.) are accurate and reliable.							
16	Quality data are timely.							

## Knowledge Management

Please tick the box on the scale that measures the extent to which you agree or disagree with the following statements in your organization:

No	My organization:	Strongly Disagree		Neither Agree nor Disagree			Strongly Agree	
		1	2	3	4	5	6	7
1	...Has difficulty acquiring new knowledge							
2	...Regularly seeks out new knowledge							
3	...Generates new knowledge							
4	...Integrates or combines different sources and types of knowledge							
5	...Widely distributes knowledge							
6	...Stores knowledge							
7	...Easily retrieves its knowledge							
8	...Easily applies its knowledge							
9	...Has employee rules of conduct regarding knowledge							
10	...Protects its knowledge from inappropriate knowledge							
11	...Protects its knowledge from theft							



### Sustainable Competitive Advantage

Please tick the box on the scale that measures the extent to which you agree or disagree with the following statements in your organization:

No	Statements	Strongly Disagree		Neither Agree nor Disagree			Strongly Agree	
		1	2	3	4	5	6	7
1	My organization's resources or capabilities are so VALUABLE that they enable us to exploit opportunities or neutralize threats in our external environment.							
2	My organization has COSTLY-TO-IMITATE resources or capabilities that our competitors cannot easily imitate or develop.							
3	My organization has DIFFICULT-TO-SUBSTITUTE resources or capabilities that cannot be easily substituted by those of our competitors.							
4	My firm has mainly produced ABOVE average market return.							
5	My organization has shown PERSISTENT superior business performance to our competitors for a long time.							

**SECTION C**

Please answer the following questions. (Note: Responses will be kept strictly confidential)

1. Please indicate which of the following industries best reflect your organization.

- a. Manufacturing
- b. Construction
- c. Financial Services
- d. Wholesale, Retail, Distribution
- e. Consultancy
- f. Hospitality
- g. Agriculture
- h. Utilities
- i. Other (Please specify) \_\_\_\_\_

2. Indicate which of the following sectors that best describes your organization:

- a. Governmental
- b. Semi-Governmental
- c. Private

3. Approximately, how many employees do you have in your organization? (Please circle as appropriate)

0- 2000	2001- 4000	4001- 6000	6001- 8000	8001- 10000	More than 10000
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4. Please indicate how long you have been working in your current job position:

\_\_\_\_\_

5. Please indicate how long you have been with your current organization: \_\_\_\_\_

6. Please indicate your job title:

\_\_\_\_\_

7. Please, what is your Gender?

- a. Female   
b. Male

If there is anything about the way your organization is using Enterprise Information Management Capability (EIMC) to improve Total Quality Management (TQM), Knowledge Management (KM) and to Sustain Competitive Advantage, which you wish to write about, please do so in the space provided below.

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**Thank you for participating in this research**

## Appendix F: Survey Screen shots



**UAEU** College of Business and Economics

**A Study of the Impact of Enterprise Information Management Capability on Sustainable Competitive Advantage**

You are invited to participate in an academic study that examines the relationship between Enterprise Information Management Capability (EIMC) and Sustainable Competitive Advantage (SCA) either directly, or indirectly through organization's Total Quality Management (TQM) and Knowledge Management (KM) practices. If you agree, you will be asked to fill in a questionnaire that should take no more than 30 minutes of your time.

Any information obtained from this questionnaire will be treated in strict confidence and will be used solely for the purposes of this study. Please be assured that the information you provide in this questionnaire will not be distributed to any third parties. Your responses to this questionnaire are anonymous, and the questionnaires are not labelled so they cannot be traced to any individual.

Although your responses to this questionnaire would be greatly valued, your participation is voluntary. Completion and return of this questionnaire will be regarded as consent.

To proceed kindly click next.

[Back](#) [Next](#)

#### 4.Sustainable Competitive Advantage

Sustainable Competitive Advantage (SCA) refers to the ability of an organization to achieve superior performance relative to the competitors.

Please tick the box on the scale that measures the extent to which you agree or disagree with the following statements in your organization:

	Strongly Agree	Agree	Slightly Agree	Neither Agree nor Disagree	Slightly Disagree	Disagree	Strongly Disagree
1. My organization's capabilities are so valuable that they enable us to exploit opportunities in our external environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My organization's capabilities are so valuable that they enable us to neutralize threats in our external environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My organization has costly-to-imitate capabilities that our competitors cannot easily imitate or develop.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My organization has difficult-to-substitute capabilities that cannot be easily substituted by those of our competitors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>