Knowledge Management Influence on Government Organisations Competitiveness.

A thesis submitted for the degree of Doctor of Philosophy by

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PhD Abstract

The need for government organizations to become competitive is growing with the huge instability in the economy. In parallel, Knowledge Management (KM) has been rapidly growing in the past decade as a source of influence on organisational development practices. Furthermore, the past decade research approaches largely failed to show the importance of KM initiatives in creating synergy with other initiatives to an extent that would lead towards organizational competitiveness. This study address whether KM holistically influences the different organisational development practices, specifically in the context of the government sector.

To ascertain the relationships between KM and four prevalent organisational development practices identified in the literature and increasingly used in practice, a quantitative survey approach was undertaken using a series of researcher-developed scales. Based on the literature review, Organisational Excellence (OE), Organisational Learning (OL), Organisational Innovation (OI) and Organisational Competitiveness (OC) were identified to be the most repeated relations with KM. A conceptual framework was designed to test the concept of the holistic influence of KM on the four identified organisational development practices.

A total of 625 valid responses were collected from top and middle management from 54 government organizations in the Kingdom of Bahrain. The model was statistically tested according to the research hypotheses by regression analysis then Structural Equation Modelling (SEM).

Results reveal strong and significant correlations amongst the five prevalent organisational development practices. Even though the holistic influence of the model could not be confirmed, findings show positive KM influence on the remaining organisational development practices, thus KM is an essential factor for government organisations.

Besides illustrating KM as an important source of influence, this research establishes a new direction that helps to integrate all governmental organisations initiatives in relevance to organisation development practices leading to better competitiveness. The study makes a novel contribution since it increases the probability of a holistic approach model that brings support for the decision makers to enhance the overall government organizations competitiveness. The scale developed for the model tested can be generalised and used as a self assessment tool for organisational practices in KE. This work sets a baseline for KM practices in the Government of Bahrain and similar GCC Governments and can act as a reference for researchers on KM and competitiveness in the emerging economies countries.

Nevertheless, the model need to be further investigated in future research to explore the missing variables in this model to make it more fit. Therefore, the concept of holistic model needs to be further subject to empirical investigations to explore its viability. The major limitation of this research is it been addressed only in the government sector and in one country.

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Dedication

To my beloved mother and to the soul of my late father, your passion, understanding, love and unshakable faith in me were a constant source of my strength. To all my family members and children whom been supporting by different means, I could not have done any of this without you; you will be always in my Heart and Thoughts!

Declaration

This thesis gives an account of the research undertaken by the author. Some of the material contained herein has been presented in the form of the following publications:

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Abbreviations

BE	Business Excellence
GO	Government Organisation
HC	Human Capital
IC	Intellectual Capital
K	Knowledge
KE	Knowledge Economy
KM	Knowledge Management
KMP	Knowledge Management Practice
OC	Organisational Competitiveness
OE	Organisational Excellence
OI	Organisational Innovation
OL	Organisational Learning

Table of Content

List of Tables

List of Figures

Chapter One – Introduction

1.0 Introduction

During the past decade research on Knowledge Management (KM) has emerged as a new direction in the management literature. In the same time many governments have started to waken up after a series of challenges that forced them to think about new approaches and practices that can help lead them to be competitive (Chua and Goh, 2008). This situation has raised the need for effective outcomes from the different initiatives that involve KM in different government programs. In the developing countries, the issue of using KM initiatives is new to many organizations and even more to governmental organizations (GO's) (Chawla and Joshi, 2010; Ikhsan and Rowland, 2004). The need for such research is rising with the shrinking budgets available and governments search for sustainable resources (Liao et al., 2008; Yang, 2008). Therefore, Chaston (2012) recently, for example, studied the role of KM in UK government local authorities in relation to innovation and where he found that both practices have a clear impact on their performance.

Having a holistic influence from KM promotes an understanding that brings all the relationships between different organisations development practices and initiatives under study (Diakoulakis et al., 2004). Holistic approach provides organizational management more options to deal with issues, complexities and challenges thus shifting KM as a dynamic practice, rather than just a concept that would help KM practices to become an effective drive towards meeting organisation customer service delivery obligations (Zheng et al., 2010). However, KM's holistic influence is a new research area and therefore the literature around it remains limited and practically does not support the government organisation specific initiatives that lead towards competitiveness in Knowledge Economy (KE) (Choo et al. 2007; Dimitriades, 2005). So far, existing research is not well developed to provide a clear understanding about the extent of knowledge management's influence on organisational competitiveness, with no clear model that tested the extent of such influence.

1.1 Background and Scope of the study: KM evolution and the need for Government Organisations Competitiveness.

Rapid changes in government services over the past two decades have attracted many researchers to the area of knowledge management (KM) and have stimulated interest in measuring and focusing on the need to improve government performance through different organisational development approaches. Many governments are trying to understand the world competitiveness, where competitiveness frameworks in governments and governmental organisations are more and more linked with characteristics of ability to maintain high quality level of services, ability to manage risks and ability to have the sense of accountability towards the future (Chawla and Joshi, 2010; Zhang et al.,2010; Wiig, 2002). Governmental organizations (GO's) therefore are required more than ever today to preserve the quality of life and to fully exploit their potential so that they can attain, maintain and/or sustain the nations and people prosperity.

Despite the increasing notion among researchers and practitioners about knowledge management's role and how it can be a practice that would support different organisational capabilities; it has yet to be investigated in the public sector of developing countries (Boumarafi and Jabnoun, 2008; Al-Alawi et al., 2007; Ikhsan and Rowland, 2004; Wiig, 2002). However, most government organisations today are not specifically structured for the application of KM concepts and initiatives needed for efficient public service-delivery coupled with global challenges in the knowledge-based economy which have motivated some governments such as the United Kingdom, Canada and Australia to consider KM implementation seriously (Haynes, 2005). Zhi-ze and Shuang-liang (2012) reflected on how KM initiatives research can rarely be found in relevance to government process reengineering. Therefore, several countries infer that government organisations need to develop their capacity for the exclusive production and provision of knowledge to meet the constant demands and reform that would need to be achieved through organisational services development as originally discussed by Osborne and Gaebler (1992). Government organizations, with their diversified and growing functions need more than ever to see what triggers its organisational success and efficiency in its services which yet remains a challenge (Luoma-aho, 2008). The economic performance of a country depends on

government organisations competitiveness since they are the major employer and provider of services that directly influence the economy through economic policy and support which affects both the cost of inputs and social services (Thornhill, 2006). To be successful in the new economy, organisations need to be capable of innovating and adopting far more quickly and effectively than their counterparts (Dimitriades, 2005).

The increasing recognition of the importance of KM as a source of Organisational Competitiveness (OC) has pushed many government organisations to try and overcome obstacles towards full utilisation of knowledge in different ways (Bogner and Bansal ,2007; Walczak ,2005; Yahya and Goh 2002). However, recent studies suggest that KM is still not well linked with certain appropriate practices relevant to organisational development despite the rapidly expanding Knowledge Economy (Lucas, 2010; Phusavat et al., 2010). Effective KM practices require an organisational climate with a reward system that value, encourage cooperation, trust, learning and innovation, which all are seen to be still missing in many government organisations (Akdere, 2009; Zack, 1999; OECD, 2001). KM as an organisational internal resource can support the development of a comprehensive system, allowing the generation of new specific knowledge according to the organisation needs; taking into consideration availability of proper environment and the organisational status (Salisbury, 2003). In different industries, the observed increases in knowledge management are associated with organizational changes towards better productivity that enables service or product differentiation, better organisational competitiveness through effective results and integrated understanding of both organisational developments with knowledge capabilities in particular environment (Thornhil, 2006).

There are many challenging environmental factors facing the government organisations in developing countries that are coincidental with the pressures towards developing effective and efficient KM practices to be one of the primary production factor on which organisational competitiveness rests (Economic Forum report, 2011-2012; Eftekharzadeh ,2008; Lee and Choi ,2003; Wiig, 2002). Furthermore, due to the high cost of government services compared with the private sector, a continual reduction of resources within the public sector needs to be supported by more effective knowledge management initiatives

and programs (Chua, 2009; Riege and Lindsay, 2006). Lately, Handzic (2010) emphasised the growing demand and need in management research to determine the interactions of KM practices and initiatives to improve organisational performance and boost the use of internal resources in an ever changing global economic environment.

Significant progress has been made in understanding the KM concept and its implementation; however a careful review of the relevant literature indicates a lack in the body of knowledge about the type of influence that KM would generate on organisation development practices and specifically in the context of governmental organizations (Salleh and Ahmed, 2008). Even though benchmarking KM was raised by different researchers, KM practices benchmarking publications are still rare in literature and definitely in lack in government sector (Al-Hasan et al., 2004; Al-Athari and Zairi, 2001; Arthur Andersen, 1996). Benchmarking is particularly of importance for governmental organisations in developing countries where such organizations mostly lack systematic, organised, structured and validated interventions or initiatives (Al-Alawai, 2007). Therefore, effectiveness of initiatives as KM programs are seen as one of the main government challenges for creating sustainable cultural change that can underpin sustained and evolving organisational competitiveness (Aranda and Fernandez, 2002). To date, most research on organisational development tends to focus on measuring performance indicators rather than identifying the practices that would enable the development of sustainable and competitive services (Rhodes et al., 2008).

1.2 Problem Statement and Overview of the Research Gaps

This section briefly outlines the main research gaps identified in literature which will be discussed in detail in Chapter Two and part of Chapter Three. The literature addresses specific aspects of KM with different organisational development practices, however none of the reviewed work explicitly investigates the connections that integrates them together (Mohamed et al., 2009; Salleh and Ahmad, 2008; Leonard-Barton, 2008). Nevertheless, holistic approaches that lead to integration of many fragmented relations are found to be relevant to enhancing the planning and decision making process (Diakoulakis et al., 2004). This is specifically essential for government organizations where the need for improved

decision making would help the transformation efforts and management of its internal resources within the context of an unstable global economy (Murray, 2008). Therefore, there is a need for initiatives that create an *influence* that changes the behaviour of the government organisations and its people, rather than just an initiative that create *impact* that would lead to a specific result.

Taking all the previous points into the consideration, the research problem addressed in this thesis is ***in the field of knowledge management (KM) and draws on the need for investigating the holistic influence of KM on organisational development practices that can widely be used to improve organisation competitiveness in the context of governmental organizations.***

This research approach is in contrast to previous studies in the field of KM that have examined the relevant concepts of organisational development practices individually and in isolation (Zhang et al., 2010; Castilla and Ruiz, 2008; Rhodes et al., 2008). The wider treatment of KM in the literature, as a consequence of the current economy, can help organisations to embrace changes of knowledge management practices relevant to enhancing performance and competitive advantage (Rhodes et al., 2008; Chinowsky and Carrillo, 2007). Leonard-Barton (1995) emphasised the importance of sustaining orgnaisation's ability and competitiveness that realise economic value through collection of knowledge assets. This emphasises the utilisation of KM as a valuable internal resource and a tool for raising organisational potentials (Raadschelders, 2005; Dimitriades, 2005). Tackling aforementioned gap in the context of the governmental organisation should help turn KM initiatives in the government organisations to be an effective driver towards meeting customer service delivery obligations (Wiig, 2002). However, due to the paucity of adequate literature on the subject in the government organisation context, more clarity on the relevance of KM performance frameworks to the different organisational development practices is needed so that such organisations can move towards being more competitive (Grimaldi and Rippa, 2011; Sotirakou and Zeppou, 2004; Gooijer, 2000). Furthermore, the limited work that holistically exist on KM influence makes many organisations reluctant to

take solid decisions about having KM as their vehicle towards better organisational competitiveness (Salleh and Ahmed, 2008; Andreu et al., 2008; Nam-Joon, 2007).

The literature supports the proposition that KM frameworks in the public sector would be more valuable if directed more purposefully towards improving its organisational development and relevant practices (Waddel and Stewart, 2008; Riege and Lindsay, 2006). Besides, practitioners have highlighted the importance of examining the relationship between KM intervention or influence and organisation development practices in support of rising community expectations (Boumarafi and Jabnoun, 2008; Waddell and Stewart, 2008; Al-Alawi et al., 2007). Introducing organisational development initiatives within the governmental organisations might be effective or useful moreover if top and middle management decision makers have a clear non-doubted appreciation on KM's role towards organisational competitiveness (Magnier-Watanabe and Dai 2008). To account for gaps succeeded in this section, the *aim and objectives* of this research are discussed in the following section.

1.3 Aim and Objectives of the study

The research reported in this thesis is based on the ***rationale*** that current frameworks do not provide clear, holistic, integrated guidance between KM and the prevalent organisational development practices such as organisation: excellence, learning, innovation, and competitiveness (Liao and Wu, 2010). Current research of KM influence and its relations does not utilise the benefits of integrating organisational development initiatives towards better organisational competitiveness (Morales et al., 2007). Therefore, it is not clear which business parameters, in relevance to practices, are affected by KM's presence and to what extent such practice influence the other development practices that government organizations need more and more today.

Therefore, to better understand the issues surrounding government organizations competitiveness in the knowledge economy, the knowledge community may benefit from a frame of reference to support the integration of KM practices with important up-to-date

organisation development practices which may help support decision makers to create different initiatives thus maximising business benefits. As a result, the ***aim of this thesis*** is to:

Investigate the influence of KM on three prevalent organisational development practices in a government setting and the influence on organisational competitiveness.

The *aim of this study* targets to support the understanding towards the utilization of governments initiatives and specifically KM program. This would be achieved through studying and defining the perceived links between the major enablers of KM practices and the major prevalent organisational development practices (Excellence – Innovation – Learning- Competitiveness). There is a need for studying the effect of KM as an independent variable in GO's on the specific dependent variables. To achieve this *aim*, the following constitutes the *key objectives of the research:*

To better understand the issues surrounding KM initiatives influence, the researcher would critically review the literature to set a frame of reference that would support the understanding of the current gaps in the relationships between KM and other prevalent practices. The framework should help understand the perceived influence of KM on organisational competitiveness, before proceeding with testing it using empirical data. Therefore,

Objective 1- *To develop an initial conceptual model for examining the holistic influence between knowledge management practices and organisational excellence, organisational learning, organisational innovation and organisational competitiveness based on examination of the literature gaps in the body of knowledge.*

The government organisations are chosen to be the context of the study due to being an area that are not well addressed in literature, and besides having an important impact on the citizens if the KM initiatives are optimised. Therefore,

Objective 2- *To empirically test the relationships between KM and each of the specified prevalent organisational development practices in the government organisations context.*

Once the *first and second objectives* are fulfilled, the researcher would provide an understanding of the extent to which KM initiatives can add value, thus pushing other practices of organisational development to be holistically integrated. This can be done through understanding the applications of the holistic relations within the proposed framework where all relations together lead KM towards influencing the organization to being more competitive. Therefore, based on the results of *objective 2*,

Objective 3*- To investigate and provide an understanding of how KM practices may contribute holistically to the organisation development practices that comprise the dimensions of organisational excellence, organisational learning, organisational innovation, and organisational competitiveness in the context of governmental organisations.*

All *objectives* are linked to specific *research gaps* raised from literature review that are presented and discussed in Chapter Two. Addressing the *objectives* would help identify the 'what' and 'how' to all gaps raised in this research. In Chapter Four, the individual objectives will be further discussed with reference to the way in which the research design enabled them to be addressed.

1.4 Research Significance

This research is significant to both academic researchers and practitioners in KM theory and practice. Many government and non-government organizations struggle to introduce initiatives relevant to organizational development, and without being able to measure its influence on other initiatives (Chua, 2009). The scarcity of integrative analysis found for the organisational development practices during different government initiatives identify a potential gap towards better organisational competitiveness. The basic assumption of this study is that organizational competitiveness will be improved under the influence of KM

practices, with the presence of organisational development practices or directly. According to Teece (2000), taking care of the context specificity, as KM in government organizations, add value to the empirical knowledge thus providing more meaningful implications. Therefore this study provides practitioners with an understanding on how to utilise KM initiatives and how to use such initiatives to achieve organisational competitiveness. This study enables government organisation decision makers to understand which initiatives are most suitable for organisational competitiveness, in a time of economic instability that is sweeping the world in the past few years. This would open new threads of knowledge that can be pursued in future studies, and will help government practitioners know the key determinants of organizational competitiveness. Further discussion on the research contribution and implications is presented in the conclusions of this study in Chapter Eight.

1.5 Brief outline of the research methodology

The *research objectives* were studied with reference to existing related frameworks and hence the development of a conceptual framework that defines and justifies the expected links between the prevalent organisational developments concepts, in the context of governmental organizations using Dooley's (2000) methods as a guide. Chapters One and Two set the background of this research thus helping to understand and identify the research issues which facilitates achieving the *first objective.*

To undertake research systematically, a research methodology has to be planned; this is discussed in detail in Chapter Four with reference to both the *research objectives and questions*. The *hypotheses* in this study were examined through the both screening and main survey following a data collection plan discussed in Chapter Five. This plan helped address the *second research objective* based on the perceptions of government organizations top and middle management. The scale developed for the main survey followed the previous work done to measure the influence of KM on other specified organisational development variables (Rhodes et al., 2008; Yang, 2008; Boumarafi and Jabnoun, 2008; Al-Alawai et al., 2007; Migdadi, 2005; Al-Busaidi and Olfman, 2005; Syed-Ikhsan and Rowland, 2004). The research design highlighted that clear measurement

scale of organisational development practices concepts (i.e. KM, OE, OL, OI and OC) needed to be used in relevance to the context of governmental organisations.

Al-Alawi et al. (2007) believes that cultural influence on KM is quite significant; however it quite common across all GO's, therefore the researcher considers a uniformity of culture acceptance. Therefore, the target sample was drawn from among the upper middle and the top management in all 54 government and semi-government organisations in the Kingdom of Bahrain (Creswell, 2003). The main instrument targets to measure decision makers perception on KM influences and specifically in the context of government organizations. For the *third objective* a regression model was developed, followed by Confirmatory Factor Analysis (CFA) with an in-depth rigorous hypotheses testing and model fit testing to see how all relations together would lead KM towards influencing the organization to being more competitive. Greater details on the methodology adopted, the relevant use of these surveys, and the results are discussed in Chapters Four, Five and Six.

1.6 Structure of the Thesis

In broad terms this PhD thesis structure followed four elements: *(a) background theory; (b) focal theory; (c) data theory and (d) novel contribution* (Phillips and Pugh, 1994). These structures shall be introduced while discussing the role of each of the eight chapters that reflect the component and execution of this study.

Chapter One- highlights general introduction while exploring and developing the discussion around the *research problem* and the *existing gap in KM influences* as well as its relationship with different organisational development practices that would lead towards organisation competitiveness, specifically in Government Organisations.

Chapter Two- presents the *background theory* (literature review), by assessing the field of research and setting out the problem domain in detail. Reviews on the theoretical and empirical literature on KM influences and the related concepts Organisational Excellence (OE), Learning (OL), Innovation (OI) and Competitiveness (OC) are presented in detail.

The nature and scope of organisational competitiveness in government organisations are reviewed. This chapter identify and cover the gaps rising from the literature review and extend them to the next chapter, hence help establish the *focal theory* that generates the *conceptual model.*

Chapter Three- defines the main issues and limitations arising from the *research problem* based on a detailed explanation and synthesis of the research gaps. The proposed *conceptual framework* is presented, identifying the associated variables, constructs and detailed study *hypotheses.*

Chapter Four- presents the *data theory* addressing the research methods used along with the data analysis approach and procedures. All methods used in this study are discussed in detail to ensure alignment with Chapter Six.

Chapter Five- discusses the *data collection design* and implementation where the questionnaire was developed and designed with all procedures relevant to the proper representation of the conceptual framework. The chapter explains the *development of new measurement scales* for KM influence, further discussion of the reasons for developing new scales are addressed here.

Chapter Six- *presents the study findings* starting with the data cleansing and organising procedure, then testing the independent and dependent variables for validity and reliability. The hypotheses are tested and hence the model is tested for the direct and intervening effects of KM influence on the specifically defined organisational practices.

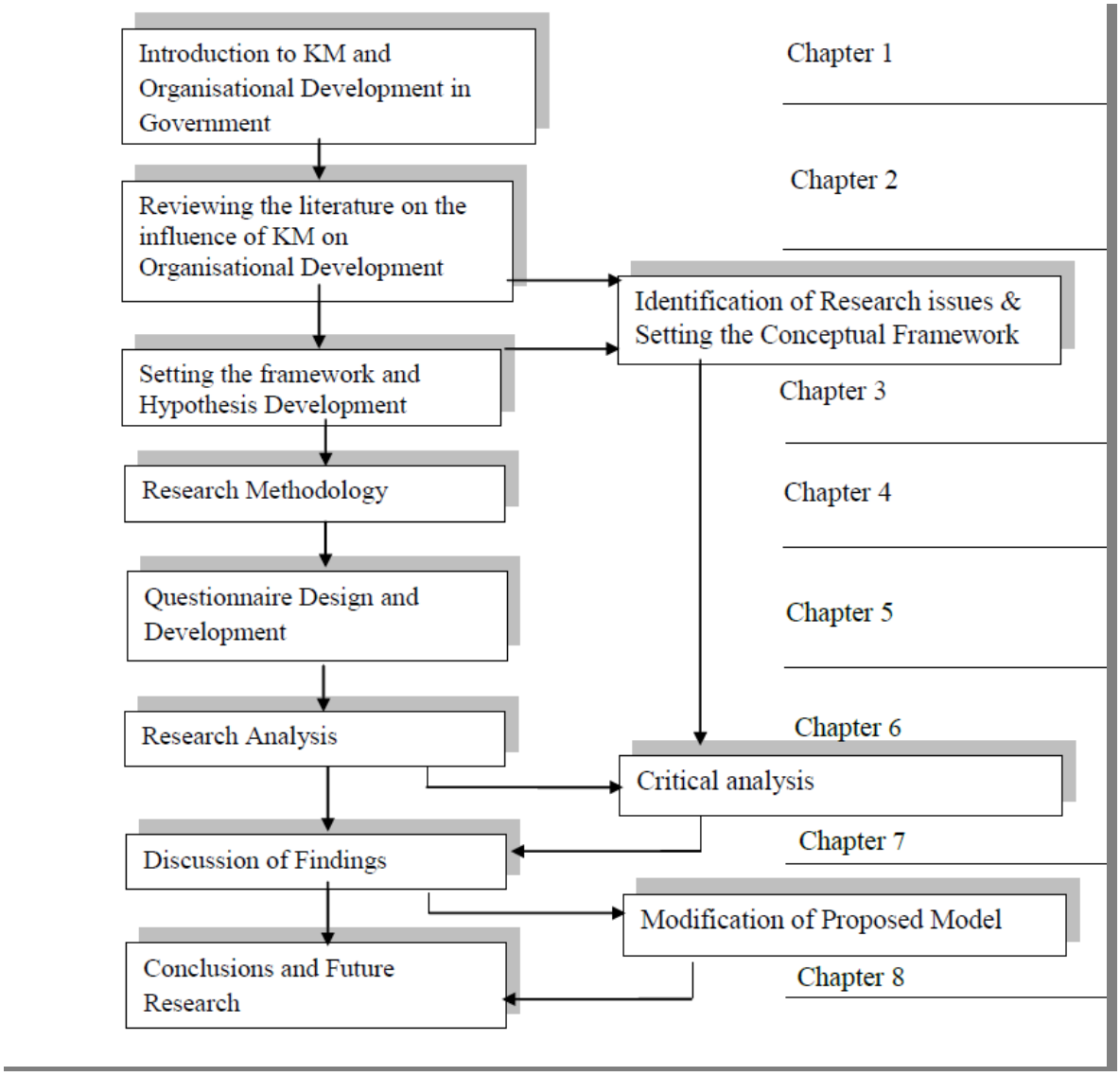
Chapter Seven- presents a *discussion of the findings* with r*eference to the study aim, research questions and the study objectives* based on the results analysed, the relationships as per the empirical research and the outcome from the main (KM-OC) survey.

Chapter Eight- This final chapter presents the main conclusions and the overall evaluation of the study and its *novel contribution.* This chapter seeks to align the thesis to the

development of the KM discipline and the body of knowledge. This Chapter concludes with *novel contributions*; implications relevance, limitations and *recommendations for future research.*

Brief Outline of thesis- Figure (1-1) presents a summary outline of the thesis structure. Furthermore detailed analysis of results evidences and research approvals are found of importance, but could not be in the body of the thesis, and are therefore presented in appendices.

Figure 0(1-1) Thesis Outline



1.7 Conclusions

In summary, as the world heads towards a more knowledge-based society, knowledge is considered to be a valuable, intangible asset and a core development mechanism of various government organisations if managed effectively. To enhance public trust, governments need organisational development programs that can meet the demand for practices that deliver better public services. However to date, there is paucity of literature examining the integrated relationship between KM and organisational development efforts. Hence, there is a need for a study that examines the specific influence of KM on the organisation development practices, with a view to improve government organisations competitiveness.

This research is of significance to the academic community since it addresses two gaps found in the literature. The *first gap* is in the influence of KM on the most prevalent organisational development practices in government organisations, while the *second gap* is in the lack of holistic practices model starting from KM, towards organizational development practices, including organisational competitiveness. Practically, this research also would enhance knowledge base for benchmarking government development practices initiatives. The researcher attempts to find the type of relations between KM and different practices to provide GO's managers with guidance on how to achieve maximum benefits from KM initiatives. The literature review presented in Chapter Two forms the basis for the conceptual framework on the influencing role of KM practices in relation to each of the four prevalent organisational developments practices identified in this study: excellence, learning, innovation and organisational competitiveness.

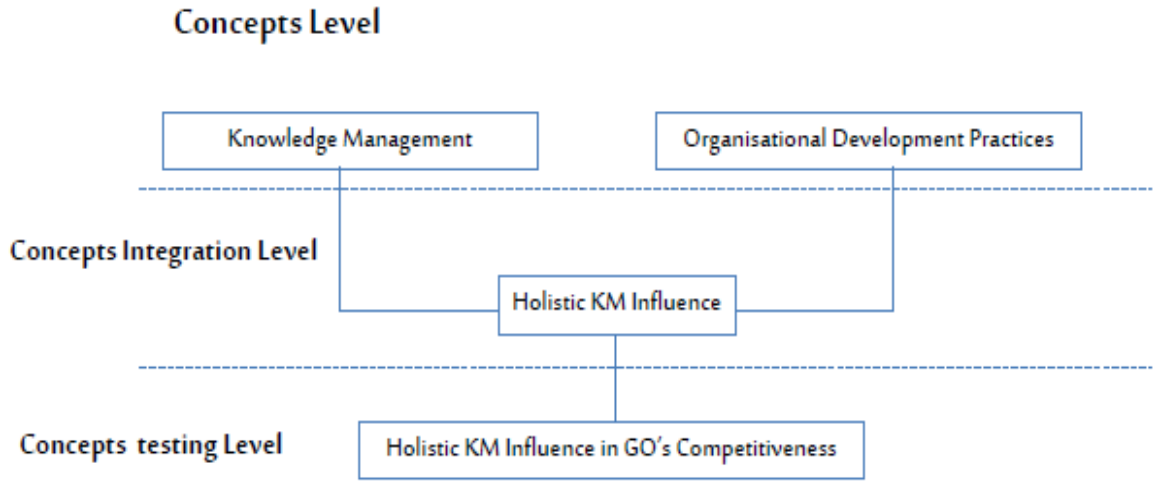
Chapter Two – Literature Review

2.0 Introduction

As shown in the previous chapter the relationship and existing frameworks between KM and organisational development practices need to be examined to provide a better understanding in the context of improving the government organisations competitiveness. Therefore this chapter examines and critically help to develop an understanding of the current body of knowledge about KM practices in relation to its ability to influence organisational development practices and in the context of government organizations (GO's). Three major concepts were reviewed to build up a comprehensive picture; the concept of knowledge management, the concept of organisational development practices, and the concept of a holistic KM practice influence. The researcher examines the relevance and proposed relationships between KM and each of the most prevalent organisational development practices repeated in the literature; organisational excellence (OE), organisational learning (OL), organisational innovation (OI) and organisational competitiveness (OC). Therefore, the literature review targets to refine the area of research in accordance to the context of study, i.e. government organizations thus would lead to subsequent development of *a conceptual framework.*

The literature review findings are organised around the *research objectives*, where the critical review follows three levels that help gradually focus on KM influence and the organisational development practices, then study the KM relationship with each of the main organisational development practices towards a holistic relationship reflected and studied, in the context of governmental organisations. Figure (2-1) shows the concepts reviewed in literature and how they combine together to address the *three objectives of this research.*

Figure (2-1) The levels of concepts integration and testing in the GO's context.



2.1 The Concept of Knowledge Management

Concept of KM has matured over many years from time of Aristotle as a quest, where knowing and reasons for knowing was the goal of the elite, but the more contemporary work can go back to back to Michael Polanyi's where he stated *"we know more than we can express"* and seen knowledge as the *'justified true belief"* (Polanyi, 1970). Therefore, it is important to review what knowledge is, before examining knowledge management (KM) further. Alavi and Leidner (2001) described knowledge *as a state of mind where knowing and understanding is gained through experience or learning*. Hence, *knowledge is information that is effective in action, and focused on results* (Drucker, 1993). Knowledge is one of an organisation's key resources influencing its intelligence, decision-making, forecasting, designing, planning, diagnosing, analysing, evaluating and having an effective intuitive judgment (Tiwana, 2000; Stewart et al., 2000). Significance of knowledge as a resource comes due to ability to create protection to the organisation from being imitated or copied easily thus its ability to create strategic equivalents (Barney, 1991) or limitation of replication (Grant, 1996). Knowledge is one of the main resources that create what is called resource-based organizations where their possessed resources and capabilities differ than competing firms in a long lasting way (Barney, 1991). This complements Teece (2001) argument that only when the organisation that has the ability to build, utilise and protect knowledge that is difficult to imitate, it can attain competitiveness. So, knowledge is

proposed to be as a production mechanism that brings in innovation in one kind of output and learning and skill enhancement in another. *Knowledge is framed experiences and values that are produced when shared, used and reused* (Davenport and Prusak, 2000; Nonaka and Takeuchi, 1995). Hence, knowledge value increases, when it is managed to influence the core values and strategic priorities of the organisation.

Based on this the management of knowledge is meant *to make knowledge the main source for enhancing an organisations ability to be more competitive in the modern economy* (Dimitriades, 2005). In general, the process of generation, codification and transfer of knowledge in organizations are usually referred to as Knowledge Management (KM) which is also found to improve business performance and decision making (Hlupic et al., 2002). This means that KM should help create, expand and exploit knowledge towards realising the organisational goals (Riege and Lindsay, 2006). Among the many definitions of KM, Hibbard (1997) was found to be the most comprehensive and hence suite the scope of this research:

"Knowledge management is the process of capturing a company's collective expertise wherever it resides – in databases, on paper, or in people's heads - and distributing it to wherever it can help produce the biggest payoff".

Thus KM may constitute processes or practices that help create, acquire, capture, share and use knowledge wherever it resides to enhance organisational development (Loermans, 2002). The American Productivity and Quality Centre (APQC) has defined KM *as the ability to get the right knowledge to the right people at the right time to help people share and put information into action in ways that strive to improve organizational performance* (APQC, 2000). These arguments pointed to the role of KM in the development of innovation, through continued organisational learning practices, or as a comprehensive management framework of organisation expertise that leads to organisational innovation (Grimaldi and Rippa, 2011). For practitioners, KM practices enhance the quality of decision-making and problem solving which can help to sustain the competitiveness of organisations in the new economy (Salleh and Ahmad, 2008; Birkinshaw and Sheehan, 2002). This view is similarly supported by Ribière and Khorramshahgol (2004) who

believe that organizations cannot achieve worldwide performance excellence without focusing on KM alongside the other quality disciplines, in order to meet customer expectations. In summary, there are mainly three approaches of KM research that emerged over the last twenty years: measuring knowledge, managing knowledge (either with emphasis on human capital or on information technologies) and creating knowledge (Lloria, 2008). This research is going to focus on both the management of knowledge and measurement of the influence of this knowledge once it is managed.

2.2 KM influence on the government organizations and its initiatives

Rusly et al. (2012) shown that KM effectiveness could be highly enhanced by the cultural change readiness. Aranda and Fernandez (2002) argued that most research on government performance today tend to focus on measuring the indicators of such performance, and analysing the source of the problem, rather than identifying the practices that would enable government organisations to have sustainable and competitive services.Understanding KM and its specific related government organization development practices are vital in developing and designing effective future programs and services (Akdere, 2009). Taking this into account along with the external society dependency seen in GO's sector, the literature was reviewed and analysed with consideration of challenges that might be faced in implementing KM and its relevant practices in this context. Understanding the processes of KM practices would benefit governmental sector since KM is more related to context-specific characteristics than just a transformation of facts (Teece, 2000).

Sharing is believed to take place only when there is trust and where there is a shared feeling of ownership of goals where tendency to share are based on the kind of interpersonal and social relationships within the organizational teams (Burke, 2011). Gorry (2008) has shown how the proper sharing of knowledge between different government organizations enhanced the staff services; giving example on the influence of knowledge sharing in social services, education, health care and therefore the overall economy. McAdam and O'Dell (2000) have proposed that the active exchange of knowledge both in private and public organisations led to improved quality, efficiency, management learning, products and

services, and reduced operating cost. Thus the presence of knowledge is believed to be a source of business benefits such as a competitive advantage, minimization of costs, improved quality, responsiveness, or improved service to customers due to the systematic and interdisciplinary approach of knowledge management (Hlupic et al., 2002). Recently, Zhi-ze and Shuang-liang (2012) shown that effective KM initiatives reduces the internal cost of management and service through re-engineering government process that would enhance efficiency and improve the service for its citizens. However, these business benefits are not clearly seen within the government organisation culture where it is believed that complex government policies create basic challenges that prevent smooth and active exchange of knowledge from even effectively transferring tacit knowledge within it (Raadschelders, 2005; Wiig, 2002). Handzic (2011) emphases that even the GO's complex interactions influences the knowledge stocks of the organisation. Three studies on the Malaysian government showed a need for knowledge sharing practices, after knowledge economy strategy that was set ten years ago (Ismail and Yusof, 2008; Kasim, 2008; Dimitriades,2005). Another work in Pakistan GO's recently carried by Abbass et al. (2011) revealed significant high relationship between the complexity of the government organisation practices and KM practices. Therefore, KM influence in government organizations, is argued by Abbass et al. (2011), if suitably initiated by KM strategies would lead to better organisational performance. Chawla and Joshi (2010) reflected the importance of KM by highlighting the Indian GO's role in setting up and facilitating economic growth in more than 51 percent of the equity in any organisation in the country. When compared to leading South East Asian countries for example Malaysia and Singapore's experience, GO's in the Gulf Cooperation Council (GCC) region are acknowledged to be lagging in creating KM suitable practices (Al-Alwai et al., 2007; Sotirakou and Zeppou ,2004; Syed-Ikhsan and Rowland, 2004). When compared to the clear Knowledge-based Economy Strategic Master Plans that Malaysian government enjoy; the lack of common KM agreed goals in the GCC government sector severely hinders the effective implementation of any coming KM initiatives in such organizations (Boumaraif and Jabnoun, 2008; Ikhsan and Rowland, 2004).

KM in government organisation still possesses challenges that are different from private sector due to the typical hierarchical and bureaucratic nature of GO's that makes sharing of knowledge difficult (Connelly et al. 2012; Riege and Lindsay, 2006; Chan and Liebowitz, 2006). Al Gore (the ex-Vice president of United State of America) practically addressed the need for rapid change in the practices of KM in the government organisation, and as a result, the USA today has many local government programs trying to create GO's that facilitate KM practices (Gore, 1996). The empirical work collected from administrative and senior officers of 28 ministries located in Malaysia supports the notion that KM practices at the organizational level are a prerequisite for successful organizational performance (Kasim, 2008). Yet, there is still a lack of empirical evidence on how KM would be an effective tool for transforming relatively uncompetitive public sector organisations to more competitive entities.

The Organisation for Economic Cooperation Development (OECD) stressed that even European government policies need to upgrade its human capital practices to meet KE requirements (OECD, 1996). Organizational human capital is found to depend on knowledge sharing practices which can have a positive influence on employee competencies and organizational performance (Hsu, 2008). One of the Malaysian government leaders, Heng (2000), stated that to compete in KE GO's need to re-think their structures, services, processes, and even markets to suit the new wave of thinking. Countries today, in general, are being measured not on power or natural resources, but more on human development index, human capital, knowledge intensity, communication technology infrastructure and transparency. Hence possibilities for innovation; specifically in the services offered by the government are expected more and more. This means that GO's would need to become more of anticipating organisations if they wish to meet this consistent source of challenge and demand. This cannot be possible unless there are KM related initiatives that would make the GO's ready for KE related expectations (Seba and Rowley, 2010; Yuen, 2007).

The frequent transfer of knowledge workers within or outside GO's can be a cause for a serious uncontrollable knowledge drain (Misra et al., 2003). Government organisations in

order to develop towards competitiveness that can overcome this knowledge drain, needs to consistently identify what it knows, understand how it uses what it knows, and develop the ability on how fast it can know and learn something new (Prusak, 2001). This challenge of human capacity building and challenge of attitude in GO's can be overcome through the active involvement of staff in the design, implementation and measurement of change (McKinnon, 2005). Government organisation need to face the demand for being more result-oriented and citizens-focused public administration (Sotirakou and Zeppo, 2005). Hence, the way KM processes are designed in GO's need to be reviewed in a way to help in establishing a set of practices that would be embedded in the social and physical structure of the organisation (Khalifa and Liu ,2003). This suggests that the future KM initiatives in government sector to be very focused, customised and integrated.

Governments are pushed to think of excellence in terms of a combination of external and internal factors services to meet population growth, weak infrastructure compared to citizens' demands, asymmetric world relations and increasing inequalities between countries (Porter, 1998). The United Nation Public Administration Network (UNPAN) conducted a workshop in 2007 on government innovation and concluded that specific KM practices would help meet the rising expectations towards enhancing citizen participation, expansion of political opportunities and improvement of operations as well as the quality of services provided towards knowledge economy. Therefore many developing countries like Singapore, Malaysia, India, China, Thailand and Dubai have realised the importance of having knowledge economy in their prime economic strategy agenda. These countries are going continually through a process of restructuring their services with emphasis to make them more competitive, integrated with global markets and increasingly being independent (Asoh et al., 2002). As government organisation knowledge is dispersed and scattered throughout different locations, in people's mind, in organisational processes, and in corporate culture while being also embedded into different artefacts and procedures or stored into different mediums; an effective KM strategy and practices to overcome cultural and behavioural obstacles in GO's is becoming more essential (Storey and Kahn, 2010; Saleh and Ahmed 2008; Bhatt, 2001). Hence, the challenges of properly implementing KM in GO's can be defined as challenges on how to conceptualize, understand, assess and

measure KM practices. A transformation framework can be useful in such situations for GO's to overcome barriers to communicate and improve OC in the new KE. The reliability of the framework relations between cultural barriers, knowledge sharing and innovation is highly important in GO's sector specifically, since the need to serve the citizens with effective, customer-specific solutions is becoming more important (Rivera-Vazquez et al., 2009).

Change readiness and knowledge acquisition are found to be highly related as per the work of Rusly et al (2012). Governments need to create and foster a culture that focuses on customers supported by resources through maintaining formal and informal dialogues to support capturing socially-based knowledge (McAdam and O'Dell, 2000). This comes at a time where increasingly knowledgeable citizens require governments to be on top of newly created KM practices as knowledge is increasingly and rapidly produced by more differentiated governments. One of the main reasons for government failure in socially-based knowledge is that extensive emphasis goes on technology, rather than management processes that emphasize people-related issues (OECD, 2001). Thus, governments need to ensure that they encourage a participative culture in their organisations at all management levels in order to enhance on formal and informal communication cycle. To accomplish such transformation, government organisations need to introduce new structures that lead to better practices that enhance its capacity to mobilise, deploy and utilise the human capital and their knowledge in service delivery (McLaughlin et al., 2008; Hsu, 2008; Oliver and Kandadi, 2006; Malhotra, 2005).

In order to address any initiative in any organisation, core organisational issues, values, culture, people and other business capabilities; need to be discussed (Magnier-Watanabe, 2008). This type of initiative helps follow the patterns of formal and informal practices within any organization thus ensure continuous development (Halawi et al., 2005).

Government organizations need initiatives and programs that would stimulate service innovation. KM focused initiatives can, according to Storey and Kahn (2010), be one of the most suitable sources for triggering innovative services. A study that was done in, the

United Arab Emirates (UAE) with diversified culture in various sectors, showed the importance of KM policies, as an essential initiative, that increases the know-how and knowledge attributes in such culture (Boumarafi and Jabnoun, 2008). This is supported by a study conducted by Yahya and Goh (2002) where KM practices in Malaysia revealed that KM in such society would result in improved work quality, organisational efficiency, better decision-making, up-to-date information and customer satisfaction.

In order to see exactly where GO's in Bahrain fall compared to the literature reviewed, and with the lack of clear literature on the subject specifically in this part of the world, a *screening survey for the context of study* was carried out at the earlier part of this research. The survey and results are presented in Appendix (1) and shows that most GO's lack experience with KM initiatives. Most GO's did not see that knowledge sharing is one of their top three challenges facing GO's. Only 27% of the participants did understand exactly what KM mean. Thus it is worth mentioning that since then the Government of Bahrain have launched a program that joined its performance excellence initiative with more KM focused practices. Both the *status screening survey* and *literature review* reveal that KM initiatives need to be designed in a way that it would ensure it overcomes the challenges expected in the government organizations.

2.3 The Concept of Organisational Development Practices in this Study

Organisational development practices as a concept *reflects measures of current practices, behavioural norms, processes and outcomes and monitor the organisation relevant change over time* (Nonaka and Takeuchi; 1995). Organisations must develop knowledge structures that play a role in organisational development practices which support the building of organisational knowing (Phusavat et al., 2010; Senge et al., 1999; Schön, 1987). The following coming sections provide a more in depth review about specific organisational development practices that this study in particular had emphasised on.

This literature review, after having scanned the organisational development environment it mostly focused on only one of the areas raised by Nonaka and Takeuchi (1995), that is,

organisational practices. Since the practices under the concept of organisational development are vast; the researcher decided to focus only on those prevalent (repeatedly identified and studied) practices that are linked to organisational development in the literature, especially in the past ten years, and in particular, those being emphasised in the context of government organisation. Thus the flow of literature in the past one decade emphasis that there are four organisational development practices that are repeatedly prevalent in KM research published, besides culture (Rhodes et al., 2008; Yang, 2007; Yeh et al., 2006; Sung, 2006). These four prevalent organisational development practices are: organisational excellence practices, organisational learning practices, organisational innovation practices and organisational competitiveness practices. Most literature published shows that organisational competitiveness and its related practices are the ultimate goal for all these organisational development related literature (Storey and Kahn, 2010; Liao and Wu, 2009; Fugate et al., 2009; Zack et al., 2009; Hsu, 2008; Thornhill, 2006; Halawi et al., 2005; Yang and Wan, 2004; Diakoulakis et al., 2004; Calantone et al., 2002; Goh, 2002; Carneiro, 2000). Therefore, the research review focus on four prevalent practices along with KM and look for potential relations as the body of knowledge thus addressing the *first objective.*

2.4 Knowledge Management Influence on Organisational Development Practices

To substantiate KM as a concept which influences the different organisational development practices, proper understanding of organisation internal and external knowledge related factors need to be considered. Key organisational internal factors such as culture; training, processes, leadership, human capital policies and networks are examples that trigger the presence of knowledge (Rhodes, 2008; De Souza, 2006; Wong, 2005; Marr et al., 2004). While Gold et al. (2001) have argued that the sources of organisation external knowledge are easily duplicated by competitors, others believe that if organisation integrate their own knowledge, with the external knowledge it would deliver organizational development practices as innovation (Chen, 2002). The exploiting of external knowledge such as that held by customers and competitors is shown to be crucial in driving innovation, performance and organisational values (Phusavat et al., 2010). Therefore, researcher found

that unless a clear understanding of how the components of KM influence the different organisational development practices, influence of subcomponents of KM would be vague Heng (2000).

In practice, KM has been implemented as international standard that is monitored on countries level since 2006. The OECD (Organization for Economic Co-operation and Development) was one of the earliest international organizations to use the term "knowledge economy" (KE) to draw attention to importance of management of knowledge in all economic activities in governments and non-government services or products. Since then the OECD developed measures for KE and KM on the government level. Moreover, KE measure was also followed also by the International Monetary Fund (IMF) and Economic Forum, which helped develop KM influence. This pushed organizations within countries and certainly GO's to benchmark their development on different factors such as KM awareness, KM strategy and open communication channels (Storey and Kahn, 2010). Some of the KM influence indexes focused on knowledge processes that start from knowledge identification, elicitation, dissemination, and utilization. However, most practical KM influence frameworks came from APQC (1996) developing a KM Assessment Tool (KMAT) that help examine four areas, namely: leadership, technology, culture, and measurement. However, Salleh and Ahmed (2008) opinion was that all available standards failed to address the extent of KM influence on practices such as teamwork, decision-making, improved efficiency, productivity, improved products or services, responsiveness to customers, innovation or creativity and quick response to other organisations' needs.

Effective KM initiatives are found to start their driving force by targeting the ability to develop rare and valuable knowledge throughout the organisation (Cong and Pandya, 2003; Nonaka, 1994). Goh (2002) considers that this type of rare knowledge is a key factor in facilitating the success of knowledge integration initiatives with other practices towards better organisational competitiveness. Nevertheless, the level of literature available demands the search for a better understanding of what ensures the success of KM initiatives © (Seba and Rowley, 2010; Khalifa and Liu, 2003). A detailed study of the influence of

KM dynamics has been prepared leading to better organisational ability in developing, implementing and maintaining appropriate practices that would enable the organisation to find, select, organise, disseminate and transfer important information and expertise thus leading to better performance (Yeh et al., 2006). The more the organisation understand how to deal with its information and expertise the more such understanding would lead to better problem solving, dynamic learning, strategic planning and decision abilities (Grover and Davenport, 2001; Alavi and Leidner, 2001). Lundvall and Nielsen (2007) went further, to suggest if an organisation focus during initiatives on the tacit knowledge itself, it would develop better abilities towards building scarcer 'know-how' with better ways of approaching problems and dealing with organisational routines.

Over the past 10 years, the literature has been enriched with work that has tried to find the different influence between the organisation development practices in pursuit for a sustained knowledge economy (Phusavat et al., 2010). The process of building, capturing and transferring knowledge targets to address the challenges for a better competitiveness, through development of better organisational learning and innovative capabilities (Rhodes et al., 2008; Chan and Liebowitz, 2006). Even recent literature further address the gap in total synergistic relations influence towards taking the organisation to competitiveness level thus achieving development and adding value through its sustained effectiveness (Zheng et al., 2010). Certain authors proposed that the presence of value happens only if knowledge is managed properly (Adams and Lamont, 2003; Blodgood and Salisbury, 2001). KM influence, if systematic and organised, is believed to support different organisational development efforts, where KM practices help push the organisation to a cycle of knowledge sharing and capturing, that in turn would lead the organisation to a better competitive position (Zack et al., 2009; Lin, 2007; Ikhsan and Rowland, 2004). The literature support the preposition that KM frameworks can be as a source of a rewarding to the organisational climate that value and encourage cooperation, trust, learning and innovation in order to improve the services provided (Lucas, 2010; Njuguna, 2009; Al-Busaid et al., 2005).

2.4.1 Knowledge Management Influence on Organisational Competitiveness

In an economy with high uncertainty, many organizations should strive to remain competitive. Competitiveness is no longer rooted in physical assets and financial capital, but in effective channelling of successful growth and longevity in business where human capital pushes organisations towards higher capacity to learn (Phusavat et al., 2010; Halawi, 2005). To be competitive means that *organizations must have unique and sustainable set of values that deliver both tangible and intangible assets that reflect onto management skills, organizational processes and routines that in turn become valuable, rare and very difficult to imitate* (Barney, 1991). This resource-based view of competitiveness has been re-emphasised later by Drucker (2002) whom realised that *competitive organisations must have the ability to shift from tangible to value based measures meaning that organisational performance capabilities would be based more on the organisational internal resources.* Yeh et al. (2006) believe that a key component in organisational competitiveness is the organization ability to realize the full potential of its intellectual assets in strategic and tactical decision making. Thus Organisational Competitiveness (OC) is thought to occur due to accumulation of values that comes from organisational internal developments when utilised and sustained, brings in practices as knowledge creation and sharing which bring in learning and innovation activities that are based on internal resources (Lin, 2007; Halawi et al., 2005).

Discipline scholars see a strong link between the capability of creating and utilizing knowledge and what makes organizations competitive (Grant, 1996; Nonaka, 1991). Thus, KM is seen more and more as the management intention that would improve the wisdom of the organisation which lead to better decision-making, increase innovation, better performance that eventually leads to sustainable competitive outcomes (Rhodes et al., 2008). KM enhances organisations ability to even produce new knowledge and help boost knowledge transfer which enhances the government organisation competitiveness through sustained changing processes (Bogner and Bansal, 2007; Raadschelders, 2005). Empirical work by Zheng (2010) and Hsu (2008) have shown that the success in KM implementation and using knowledge sharing can have a high potential of enhancing organization competitiveness. Carneiro (2000) proposed that KM initiatives can be as a source for higher

human value that would lead to higher level of organisational competencies. Following a different perspective; Zaim et al. (2007) argues that KM influence can come from infrastructure and not practices only. However, the latest work by Mills and Smith (2011) for example, shows that now more and more authors believe that the only source of KM influence related to organizational competitiveness comes from direct knowledge applications and practices. Prominent KM scholars Davenport and Prusak (2000), actually emphasis that KM practices need to fit the organizational context in order to create a competitive edge. Rhodes et al (2008) believes that such practices of KM can be examined through a more balanced approach of assessing organizational non-financial performance indicators that can be leveraged to develop key organizational capabilities which are difficult for competitors to imitate. However it is believed that unless this KM is kept and maintained at superiority through specific practices as in learning; organizations would find themselves at a competitive disadvantage in the future (Zack et al., 2009).

The competition of today requires more than just organisation capabilities; it is about speed of reacting to need. The faster GO's plan and implement a response, the more likely they will succeed over their competitors in delivering value to the customer. In addition, the more a response is based on knowledge of the business environment as opposed to internal politics, and the faster a response is planned and implemented, the more likely that greater value will be delivered relative to competitors' differentiation, (Fugate et al., 2009). However despite extensive review, the literature appears to have failed to address the type of competitive practices that could occur through KM.

2.4.2 KM Influence on Organisational Excellence

Understanding Organisational Excellence (OE), often labelled Business Excellence can be represented by a set of practices, such as, *leadership, process management and resource optimisation following social responsibility to ensure best products and services that leads to customer satisfaction* (Castilla and Riuz, 2008). The importance of KM to organisational excellence (OE) interventions which have been built on the foundation of Total Quality Management (TQM) and Business Processes Re-engineering (BPR) as the core

competencies of organisational development practices has been identified by many different studies (Akdere, 2009; Zhao and Bryar, 2001; Lim et al., 1999). Through Business Excellence Models interest of linking quality approaches and KM was raised over the past decade (Akdere, 2009; Singh, 2008; Castila and Ruiz, 2008). Business excellence frameworks are considered to be the practical source for most of OE practices and initiatives. Currently there are popular international frameworks as European Foundation of Quality Management (EFQM) and Malcolm Baldrige National Quality Awards (MBNQA) which are derived from TQM, which more specifically define detailed scales and practices that would lead to the establishment of OE (Bou-Llusar et al., 2008). Essentially, in knowledge economy it is believed that OE requires speed, management of complexity, a sense of history within the suitable context, effective judgement and organisational flexibility which cannot happen by coincidence (Dimitriades, 2005). Organisational excellence practices are found to contribute to the organisational flexibility and deal with outcome improvements through the consistent emphasis on values (Bou-Llusar et al., 2008; Lim et al., 1999; Davenport and Prusak, 2000).

The influence of KM on OE programs is reflected through its support to the business through establishing cause and effect relationships where effective utilisation of knowledge support the existence of excellence practices (Castilla and Riuz, 2008; Yeh et al., 2006). KM are thought to influence specific practices relevant to service quality, client satisfaction, better knowledge of competitive environment, increased innovation capabilities and improved response time (Andreu et al., 2008; Castilla and Riuz, 2008; Santos-Vijande and Alvarez-Gonzalez, 2007). Ribeire and Khorramshahgol's (2004) study was one of the earliest structured works that proposed the integration between KM and OE. Overall, almost all excellence models propose a form for organizations development and have tried to create a closed loop cycle between KM and OE that would lead to innovation and learning (Jackson, 1999; EFQM, 2000).

With more pressure on government organisation, the need to assess the organisational abilities to create better and more reliable services put forward KM as a stimulator for

better organisation development allowing the organisation to think not only about efficiently improving routine work, but rather *aim* to attain high adaptability and flexibility and a tool that preserve the organisation concentration and motivation (Yang, 2008; Zaim et al., 2007; Basadur and Gelade, 2006). A number of authors have argued that KM can support organisational excellence initiatives through being a tool for staff involvement which would lead to better operational and financial performance (Akdere, 2009; Yang, 2008; Waddell and Stewart, 2008). Hung et al. (2010) sees that through KM initiatives, OE as a management practice can assist organisations in cultivating their ability to change and continuously improve.

Thus KM role is proposed to preserve organisational staff concentration and motivation while supporting the delivery of quality service (Massingham and Diment, 2009; Yang, 2008). Ribeire and Khorrmshahgol (2004) believe that there are commonalties between KM and OE which can help improve each other performance once integrated in one initiative. Therefore, more GO's use KM practices for improving organisational performance thus pushing for better understanding and more in-depth collective organisational knowledge (Liao and Wu, 2009 ; Rhodes et al. ,2008; Von Krough et al., 2000).

Most researches show bi-directional influence between KM and OE, however the focus in this literature review shows possible high KM influence on OE. Goh (2002) was one of the earliest to propose that certain OE practices as organisational design and rewarding scheme would have an influence on KM towards competitiveness, due to its role in knowledge transfer. Some authors believe that quality management and knowledge management are complementary, if not compatible, leading towards OC, Waddell and Stewart (2008). However, Diakoulakis et al (2004) proposed that the presence of KM enhances productivity, cost reduction, quality of decision making, human capital and process management which covers all main enablers for organizational excellence practices as per the mentioned frameworks of reference such as EFQM and MBQNA. Yang (2008) believes that the extent of KM direct influence on the quality assurance program is so important for it excellence sustainability. The recent study of Hung et al. (2010) goes further to show

that KM presence would lead to TQM or OE practices which are believed to lead to better organisational innovation.

2.4.3 KM influence on Organisational Learning

Organisational Learning (OL) is seen as the ability of the organisation to learn from others and from within, which as Senge (1990) has argued, could have a significant influence on how knowledge is transferred. Organisational learning implies both: *being aware of the need for different levels of learning, and the storing of knowledge in the organisation* (Ortenblad, 2004). OL represent the *capacity to change, through continuous improvement that is based on lessons learned from mistakes and learning from best practices* (Ingelgard et al., 2002; Martin, 2004). OL is argued to be the source of *organisational capability that can enhance the areas of experimentation, risk taking, external environment interaction and participative decision-making that lead to better organisational dialogue* (Dimitriades, 2005). Chawla and Joshi (2011) even that the KM best practices can create OL for improving governmental organisation performance.

Recently, Venkitachalam and Busch (2012) and Lee et al. (2012) showed how tacit know-how account for an organization's learning capability and how it is critical to certain organizational roles than others. Firestone and McElroy (2004) were the earliest to argue the possibility of integrating KM and OL as they believed that the difference between the two disciplines is showed to be complementary and have a close relationship. Disciplines as organizational innovation, integrity, accountability, and risk management all seem to be effected if the relation between both KM and OL is clearly set (Maden, 2012; Firestone and McElroy, 2004). Certain authors proposed that the definition of OL has a clear relation on the wider use of KM, that makes them both a main source of acceleration in the rate of change in the learning economy where the capability to learn becomes more important than given sets of specific capabilities (Lundvall, 2003). KM and OL are believed to be linked to the satisfaction and the encouragement for learning practices as a result of organisation development (Lee and Choi, 2003). Even though literature does not clearly distinguish between KM and OL, OL is argued as the process to facilitate knowledge sharing and

establishes continuous learning process within an organisation (Singh, 2008). Therefore Basadur and Gelade (2006) argued that the current concepts of KM and OL can improve organisational effectiveness through grasping opportunities that lead to better enhancement of human capital, innovation, social and organisational capital (Njuguna, 2009; Morales et al. 2007; Ju et al., 2006; Moffet et al., 2003). The cyclical development of OL caused by KM gives strength for the strategic role of KM holistic and comprehensive model (Hughes et al., 2008). However, both OL and KM practices require a culture of trust and cooperation in order to play a role in the organisation ability towards organisational innovation (OI) or OC (Tseng, 2010; Rhodes et al., 2008; Chinowsky and Carrillo, 2007). OL occurs when KM in one part of an organisation is transferred effectively to other parts and used to solve problems or to provide new and creative insights (Goh, 2002; Gravin, 1993). Eskildsen et al. (1999) found that OL and OE have similar strength on each other. While, the "learn and contribute" concept is considered the most challenging and vital steps for that can lead to OI and OC later (Rhodes et al., 2008). Therefore, it is believed that KM can influence the OL strategy in sequence of getting the information or the knowledge, using it, learning more and then contributing again (McAdam and O'Dell ,2000).

KM is argued to have a role in assisting employees in creating and using knowledge; establishing appropriate networks through engaging in double-loop learning along with network practices, that ease the complexity of the OL processes, and which helps to overcome the difficulty of unlearning (Yahya and Goh, 2002; Hwang, 2003). Therefore, *KM help organizations to establish its ability to learn and adapt to fast changing competitive global environment through establishing internal processes that help convert learning and capital-based resources into desired outputs* (Harvey et al., 2004; Grant, 1996). Without certain KM practices, it has been argued that organisations cannot develop personal or group learning abilities (Liao and Wu, 2009, Su et al., 2004). However, Su et al. (2004) specifically find OL role as mediator between the different KM practices. While, Liao and Wu (2009) proposed that OL gradually help establish managerial commitment, systems perspective, openness and experimentation, knowledge transfer and integration. Knowledge acquisition, for example, has been proposed to have both direct and indirect

influence on organisational learning and excellence practices (Akdere, 2009; Darroch, 2005).

The literature shows that KM initiatives, when established within organizational commitment, including provision for i.e. a learning climate this is believed to be effective in developing learning organization capacity (Massingham and Diment, 2009; Bishop et al., 2008). OL is found to resonate and develop in a dynamic process where knowledge moves along the different levels of action, going from an individual to a group level, and then to the organisational level and back again (Fugate et al., 2009; Hughes et al., 2008). This relationship between KM and OL is therefore believed to be as the hook adopting new habits and beliefs that would facilitate the transition from a reactive attitude, characterized by a slow adaptation to change, to a proactive attitude that anticipates modifications (Castilla and Riuz, 2008; Basadur and Gelade, 2006).

2.4.4 KM influence on Organisational Innovation

Innovative organisation (OI) can be described as the practices in the organisation that lead to *having an environment of proper management with proper climate that lead to removal of barriers against idea generation and its implementation* (Lee et al., 2011, Hung et al., 2010; Majaro, 1992). Researchers believe that through organisational innovation redundant learning is decreased and organisational efficiency and responsiveness is increased (Basadur and Gelade, 2006). OI is found to depend on the working environment that varies in the extent of the knowledge and experience that can be shared (Tiwana, 2000). Jensen et al. (2007) further argued that the informal processes of learning and experience-based know-how establish different forms of knowledge that lead to different modes of innovation, since this style of unstructured learning attract communities of practice in mobilizing tacit knowledge and innovation in problem-solving and learning.

With proper KM influence, addressing business problems can help create innovative products or services that would enhance customer relationships, thus ensuring organisational growth (Vaccaro et al., 2010; Thornhill, 2006; Jiang and Li, 2009). KM

practices are believed to play an intermediaries role towards OI, (Grimaldi and Rippa, 2011; Jiang and Li, 2009). To enhance the relationships between ability to retrieve and use knowledge, called knowledge inertia, it is argued that OL and OI would play a role in enhancing the organisational problem-solving practices, depending on the type of organization (Pun and Balkisson, 2011; Liao et al., 2008). Hung et al. (2010) reported that humanist approach to KM influence significantly and positively innovation performance when compared to IT-focused KM approach.

Chaston (2012) believed that KM influence the open innovation practices in GO's through enhancing the way the organisation work with its partners starting with changing the way of administering and improving work practices and processes. The consistent influence of KM is found to enhance the organisation ability to produce products or services that are competitive, efficient, and effective while being able to continuously improve (Goh, 2005; Yahya and Goh, 2001). KM practices are found to enhance the ongoing interaction of individuals and groups in creating, capturing and sharing knowledge while turning it into new services and profitable products (Boumarafi and Jabnoun, 2008). This was followed by a proposition by Hua et al (2009), who confirmed the relationships between and among knowledge sharing, team culture and service innovation performance are significant and strong. Kumar and Rose (2012) also confirmed from a study on Malaysian government culture that knowledge sharing capability and employees' innovation capability are highly linked to their ethics and believes.

Nowadays, innovation management emerges as viable concepts that would lead to OC through better performance and competitive edge that would happen through improvement in cultural creativity (Chaston 2012; Rhodes et al., 2008; Jiménez and Navarro, 2007). This means with more proper cultural communication knowledge transfer can be facilitated to broaden organisational learning that would lead to OI (Lin, 2007; Adams and Lamont, 2003). KM is seen to raise the capacity of the organisation making sense of past compilation of experiences connecting patterns from the past to the present and future, this enhances the ability of the organisation to speed up creative operations to generate OI (Rivera et al.,2009; Carneiro, 2000; Sa´nchez et al., 2000). Certain culture practices as

interpersonal trust, communication between staff, information systems availability, coordination, adaptability, responsiveness, organisation structure and rewards have been found to influence KM and OI, (Al-Alawi et al., 2007). This is covered in more detail in the next section. The influence of KM has a number of positive results that triggers OI, starting from maximising the utilisation of resources, to creating better government capacity to delivering value added services which finally encourages more open culture that improves good governance in general (Chuang et al., 2010). If this happen then improving the image of the GO's can be an achievable task and this would raise the pride of civil servants, possibly leading to a culture of continuous improvement (Lee et al., 2011).

Certain studies demonstrate that knowledge sharing is a KM enabler that would enhance innovation performance and reduce redundant learning efforts (Calantone et al., 2002; Syed-Ikhsan and Rowland, 2004). Lin (2007) argued further that employee willingness to both donate and collect knowledge enable the firm to improve innovation capability. Knowledge has the possibility to influence innovation when the organisation has to share and make interactions in the way they both influence organisation performance towards competitiveness, (Thornhill, 2006). Vaccaro et al. (2010) shown how KM would have an influence on the performances of business units involved in inter-organisation innovation initiatives. However, scarce research could be found where KM-OI relation would also be applicable to government organizations.

2.5 The holistic approach of KM influence towards Organisation Development

All previous studies on KM relation with organisational development practices have focused on the fragmented influence of KM, but did not address the holistic influence of KM on all the practices that would lead alternatively directly or indirectly towards organisational competitiveness (Lee et al., 2012). In era where resources on government organizations are shrinking and initiatives should be focused a holistic view should help *improve the understanding of the interactions between the KM practices and other organizational development practices an*d how it should lead towards better organisational competitiveness. This Holism thinking was brought in practice by Senge (1990) to *reflect*

the interconnectedness as part of the system thinking approach proposed to bring organisational essence together. The principles and practices of holistic approach are important for a future learning and competitive organisations. In this study, to appreciate the KM influence, principles and practices that are prevalent in the literature of organizational development was traced. Special focus was given by the researcher for the progress in the past decade. Practices of the different principles as (i.e. OE, OL, OI) proven to have relation with OC were studied. Then the holistic approach was used in literature to reflect the integration of these different principles, as the different prevalent organisational development practices, to achieve a specific outcome leading to organisational competitiveness. For example, Hlupic et al. (2002) argued that integration of 'hard', 'soft' and 'abstract' as technological structure for data access and manipulation; organizational structures and processes that harness intellectual and human capital for learning, innovation and problem solving are the basis for knowledge base programs. However, in this research the holistic approach targets to *integrate organisational development practices in the KM path framework thus bringing a comprehensive cause-effect model where the prescriptive and descriptive thinking are used.* Therefore, the study here investigate whether effectiveness of the organizations is expected to raise once holistic approach is used, since it prescribes different ways to engage KM activities and identify its attributes (Heisig, 2009; Diakoulakis et al., 2004; Rubenstein et al., 2001). Thus the holistic approach proposed of the KM influence gives importance and focus to organisational change efforts and performance (Heisig, 2009; Ramalingam, 2006; Diakoulakis et al., 2004). Recently Lee et al. (2012) showed the importance of holistic view in giving insights for KM researchers through explaining the integrated aspects of KM performance and its relevant relationships on the organizational outcomes.

As the preceding sections have shown, many researchers have identified the role of KM in achieving organisational competitiveness through different organisational development variables (Castila and Ruiz, 2008; Thornhill, 2006; Zhao and Bryar, 2001; Zack, 1999; Lim et al., 1999). However, if KM influence is believed to be consistent it would foster knowledge towards better performance. Therefore, absence of an overall understanding of the different relations that integrates the KM models together gives a serious gap in the

literature (Ho, 2008; Gooijer, 2000; Leonard-Barton, 1995). As mentioned in Chapter one, this means that this research brings in frameworks that are relevant to knowledge management, knowledge measurement besides knowledge creation.

Certain authors have tried to reflect the role of KM through concepts and framework illustrating the relationship between KM and different organisational development practices, but empirically tested only one or two specific relationships (Morales et al., 2007; Dimitriades, 2005). Evidence in literature supports a more holistic approach towards business and organisational strategy that is tightly linked to KM influence (Storey and Kahn, 2010; Appleby and Clark, 1997). Concepts relevant to human behaviours, attitudes, capabilities, business philosophies, operations, utilisation of technologies and practices have been repeatedly presented in different frameworks that integrate two perspectives or maximum three. However, rarely practices of knowledge management, learning and other organisational improvement practices have been linked under one framework (Choo et al., 2007). The building blocks of a holistic KM model are argued to be of knowledge practices with organisation's capacity, but again not enough studies carried in this pipeline (Probst, 2002).

Most of the work done in literature, including the recent ones, addressed the holistic influence as an approach that would lead to sustained results (Lee et al., 2012; Handzik, 2011; Salleh and Ahmed, 2008; McElroy, 2002). However, the existing holistic KM model fails to recognize the effectual KM influence on organisational practices and values thus fail to identify the multidimensional nature of KM dynamics on the organisations (Yang et al., 2009; Moralesa et al., 2007). Hence the overall look at the literature reviewed emphasise that KM and the other prevalent organisational development practices (OE, OL, OI) can be a source of a comprehensive or holistic approach that would ensure better organisational competitiveness (Lee et al.,2012; Liao and Wu ,2010; Liao and Wu, 2009). However, this depends further on the type of KM used. For example, Nonaka (1994) believes that if KM represented by knowledge sharing gets the chance of transforming and exploiting the new knowledge throughout the organisation, eventually it would convert and incorporate value-creating resources into the operating routines. The work of Yang (2008),

Rhodes et al. (2008) and Lahti et al. (2002) argue that in order to foster an environment of continuous learning and improvement, firms must possess and grow superior KM capabilities. Castilla and Riuz (2008), and in continuation to the work Davenport and Prusak (2000) emphasised that continuous OL emanates from the articulation and internal formalization of diverse types of knowledge. Leveraging the core competencies of KM is argued to be the holistic source of learning practices that would help control throughput, quality maximisation and cost minimisation thus pushing towards organisation innovation and competitiveness (Akgun et al., 2007).

The strength that KM influence has towards the ability to lead to different practices that would deliver above-average organisational growth and profitability has been highly appreciated by Grant (1996). Some authors believe that KM and OL practices, for example, are a pre-requisite for transformation towards business excellence which leads to trigger the holistic influence (Eskildsen et al., 1999). Zack (1999) and Huber (1998) even postulate that effective knowledge creation, knowledge sharing and knowledge leveraging in an organisational climate of reward, value and cooperation and trust lead to the establishment of OL and OI practice. Palacios et al. (2009) proposed that influence of KM on OI would help develop distinctive competences that would establish a set of principles, values and practices towards OC. Overall, a number of further studies see KM practices as an enabler to enhance organisational developments practices, while reducing redundant learning efforts (Scarbrough, 2003; Calantone et al., 2002).

In continuation to the importance of integration between organisational development practices, some authors argue that KM should be used for storing of knowledge to enhance organisation ability to learn the lessons and pass it on (Migdadi, 2005). Halawi et al. (2005) maintaining a general acceptance that organisational competitiveness in the 21st century will be more accomplished through KM. OL is shown as a mechanism for creating, acquiring, sharing, applying knowledge holistically this embrace change that leads to OI at all levels, resulting in optimum performance and maximum OC (Lee et al., 2012; Chinowsky and Carrillo, 2007; Migdadi, 2000). DeNisi et al. (2003) mentioned that such

continuous OL has cumulative effects that are much more difficult to imitate and are considered to be an important capability that can serve as a source of OC. Goh (2003) noted the importance of integration starting from the adoption of a strategy that would encourage employees to learn new skills continually to be innovative thus building a driving force for development and growth that enhances the firms' ability to sustain OC. Thus, the concept of integrating between the different organisational development practices towards building a better organisational competitiveness is not a totally new attempt in the literature. However, most previous work in literature is mostly propositions with no empirical work that brings in all prevalent organisational development practices towards one final goal (Yeh et al., 2006.; Halawi et al., 2005; Dimitriades, 2005; Diakoulakis et al., 2004; Ribeire and Khorrmshahgol, 2004; Wiig, 2002; Goh, 2002; Mc Elroy, 2000).

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2.6 A Note on Organisational Culture and Government Organisation Specificity in the scope of KM influence

The need to investigate to what extent organisational development practices are promoting a benefit to country's competitiveness are rising (Pun and Balkisson, 2011). Burke (2009) seen that the levels of information fulfilment are affected by cultural factors which move the organisation to a better competitive place. Culture which is *a set of shared assumptions, values, and norms is usually considered when introducing KM initiatives since it affects how an organization accepts and fosters new concepts* (Magnier-Watanabe, 2008; Davenport and Prusak, 2000). Mason and Pauleen (2003) define five barriers that inhibit successful implementation of KM in any culture starting from lack of clear organisational culture, proper management support, vision clarity and reward, and poor management practices. KM when studied with relevance to organisational culture establishes precisely the type of influence needed to meet all circumstances under a dynamic environment as in government sector (Tseng, 2010; Nonaka and Takeuchi, 1995).

For government organizations that have been well established for over 50 years, culture has been an issue of being a barrier for many government initiatives (Chawla and Joshi 2010). Most GO's have similar culture even though some may have developed faster than others

in the past one decade. The competencies for these GO's in the 21st century differ in many ways from the past, especially as there are new demands placed on governments, in terms of skills, knowledge and capacities. Expectations of the society have rapidly increased in the need for innovative services from government entities that reflect a higher customer value (Lee and Choi, 2003).

The limitation of understanding the culture of any organisation determines the effectiveness of KM influence (Migdadi, 2005). According to Kotter and Hasket (1992), the relationship between organisational culture and performance involves goal alignment, fitness and adaptation which need strong leadership to create an adaptive change. The KM activities and resources link between practices of culture and the need for organisational adjustments (Holsapple and Joshi, 2004). Alternately, changing people's behaviour to share knowledge is one of the most difficult issues in managing knowledge in any organisation and is considered very important in creating social interaction (Davenport and Prusak, 2000; Al-Athari and Zairi, 2001). Relations between government organizations and society are moving from being totally dependent to independent towards more of interdependent. Therefore as mentioned earlier, GO's as a context, by nature exhibit a complex environment need to have the resources to operate in inter-dependence with its society; this requires unique cultures of excellence while managing the dominance of organisational politics that hinders KM practices. In realizing the challenge due to limited awareness of KM importance in government sector, in 1999 the UK government brought in a call for smarter KM across the government, which increasingly enabled to harness its data and experience more effectively, and to work in new ways. The Former UK prime minister, Tony Blair's cabinet office (under the scheme of Modernising Government), introduced an innovation and performance report in year 2000, where the report tackled how government might make better use of the external knowledge pool through strengthening links between government and academia, learning from the private sector and contracting out analytical work whilst retaining an intelligent customer capability in-house. Such practices would help GO's change its role towards society. This was followed also in 2008 by late Former Prime Minister Gordon Brown, where an initiative focusing on building government's capability in managing knowledge was realised. This shows therefore that even leading

governments today are still in need of KM initiatives that would examine and improves policy-making processes and the challenges towards better governments' service delivery (McKinnon, 2005).

According to Grant (1996), diverse knowledge bases and the unique capabilities among organisations are the major determinant of sustained competitiveness and superior corporate culture. Organisational culture that spread confidence and trust is considered to be an important factor before the application and development of any KM initiatives, specifically in government services (Riege and Lindsay, 2006). KM is even considered today as the main driver for the adoption of diversity management and management of change in organisational culture (Nonaka et al., 2000). The reviewed body of knowledge recognise the strong relation between KM practices and communication practices that comes as a result of organisational culture structure and strategy (Zheng et al., 2010). GO's specificity was discussed by different researchers, to play a role in defining the outcome of KM influence study, reflecting the need to understand what similar studies have been done so far in this area (Chua and Goh, 2008; Al-Busaidi and Olfman, 2005). Therefore, the issue of governmental organisational culture in each part of the world similarly needs to be taken into consideration when trying to establish KM practices which may affect the organisational behaviour or acceptance to change. Even though this research recognises the importance of culture as key feature influencing KM approaches and adoption, the researcher found it is not feasible to address the culture as a main concept or a dimension within the specific scope of this study, where five main management concepts were already been studied. It was decided that cultural measures need to be impeded in each of the five constructs (KM, OE, OL, OI and OC) through indicators whenever it is suitable as per the literature evidence. It is however presumed, that based on the context of the study being the government organisations only and in one country, the culture issue is going to be considered as a controlled factor, where examining the culture as a main dimension in this context is left for other future researchers.

2.7 Synthesis of the literature and body of knowledge gap

Based on the literature review studied previously, Table (2-1) is developed to show the synthesis of the literature and body of knowledge gap. An examination of the work shown in Table (2-1) indicates that the literature has shown an interest in KM frameworks as a source of different organisational development practices. However, the literature fails to address whether KM influence strengthens the collections of organisational developments holistically leading to organisational competitiveness. Absence of an overall understanding of the different relations that integrate such models together is identified as a major gap in literature.

It is worth mentioning the researcher explored different publications that covered non-prevalent organisational development practices, that were not frequently repeated in the literature reviewed, such as Governance (Rashman et al., 2009), Openness (Jerez-Gomez et al., 2005) and Brand Performance (Weerawardenaa et al., 2006), Rewards Policy (Al-Busaid et al., 2005). Furthermore, the researcher had to eliminate other organisational development practices that would considerably overlap with prevalent practices due to limitation of the study scope, such as intellectual capital (Haslinda and Sarinah, 2009), structure (Gold et al., 2001) and culture (Al-Alawi et al., 2007); as mentioned in the earlier section. However, what the synthesis moreover shows is that the past decades work has been steadily improving propositions on KM holistic influence, without empirical testing. Thus the table shows that in the last decade relatively limited research had managed to have all prevalent practices under focus together at one time. Table (2-2) summarise and identify current KM research gap in the area of integration between the different practices. The importance of this research synthesis goes further in supporting organisational efforts towards competitiveness and meeting KE demands. It can be agreed that changes in the competitive environment in relevant to KM, as an internal resource, was the focus of many studies in the past decade as shown in Table (2-2).

Table (2-1) Synthesis of the literature on the type of KM frameworks as a source for organisational development.

Reference	Type of KM Framework
Oliver (1997)	Organisation's competitiveness with internal culture, external influences from government, society and inter-organisation relations.
Pervaiz et al. (1999)	Capture relationships influencing learning and continuous improvement.
Holsapple and Joshi (1999)	Provide a description and comparative analysis of ten descriptive KM frameworks and models that explain aspects of the KM phenomena.
McAdam and McCreedy (1999)	Three KM models: knowledge category models, intellectual capital models and socially constructed models.
Carneiro (2000)	A framework with special focus on relationships between KM, OC, and OI.
Gooijer (2000)	Designing a KM performance framework
Gold et al. (2001)	Competitive predisposition of an organisation as it enters KM program of knowledge assets and knowledge capabilities
Wiig (2002)	KM in Organisational Performance in Governmental Organizations
Frid (2003)	Five KM development levels: knowledge chaotic, knowledge aware, knowledge focused, knowledge managed, and knowledge centric.
López (2005)	Competitive Advantage through OL practices
Basadur and Gelade (2006)	Utilization of knowledge, not only to improve routine work (efficiency) but also for the non-routine work.
Riege and Lindsay (2006)	How KM theories are applied in the government sector
Willem and Buelens (2007)	Exploit the effectiveness of knowledge sharing among GO's
Hughes et al. (2008)	Relation between OL, market orientation, strategic pro-activeness, and organisational performance
Zhang (2008)	Understand Knowledge Management in Government
Castilla and Riuz (2008)	Role of KM Strategic models for sustainable competitive advantage.
Rhodes et al. (2008)	Influence of KM on organisational factors (IT systems, structured learning strategies, innovative culture, flexible structure) on knowledge transfer.
Rivera-Vazquez et al. (2009)	Relation between cultural barrier and knowledge sharing and innovation
Tseng (2010)	Investigate relation between organizational culture and knowledge conversion on corporate performance.
Zheng (2010)	Examines possible mediating role of KM between organizational culture, structure, strategy, and organizational effectiveness.
Mills and Smith (2011)	Impact of KM resources, enablers and processes on performance.
Handzic (2011)	Integrated socio-technical KM to determine the relative importance of social and technical initiatives in organizational KM.
Lee et al. (2012)	Relationship between KM infrastructures, knowledge process capabilities, creative organizational learning, and organizational performance.
Yusof et al (2012)	Holistic knowledge for GO's sharing integrated approach, which combines KM influence (input), K-sharing quality (process), workers' performance service delivery (output).
Lee et al (2012)	Holistic view of KM performance framework that explains the integrated aspects of KM performance by examining the relationships between KM

	infrastructure, knowledge capabilities, and competitiveness.

From more than 100 important references reviewed and referred to in this thesis, 44 publications are found to be most important for studying the *holistic KM influence* on one or more the identified prevalent organisational development practices reflected in Table (2-2). Studies in GO's environment were found to be limited and usually focus on one or two relationships. Only four published literature were found on the holistic approach could really identified with the set criteria, i.e. four relations or more between KM and the organisational development practices identified (Zheng et al., 2010; Heisig, 2009; Moralies et al., 2007; Diakoulakis et al., 2004). Most of the work was propositions not actual empirical work. More than 50% of the work has been done after 2008 which shows that the flow in this field and scope is increasing. However, most of the work is still in non-government sector, which shows a major gap in literature. Besides, none of the work presented in Table (2-2) are in Middle East or GCC. ©

The learning from the reviewed literature is that most research focused on relation between KM and Organisational innovation or competitiveness, while combining more than three prevalent organisational development practices. Table (2-2) shows on the right of the dotted line the limited research to date in relation to KM holistic approaches studying four prevalent organisational development practices together. .

Table (2-2) Flow of work on the KM influence in the past ten years

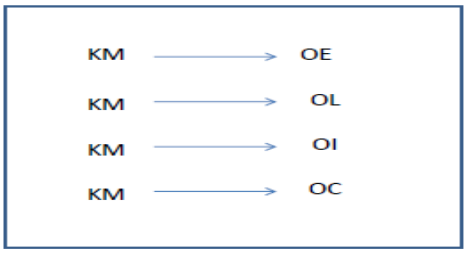
Four or more <u>prevalent</u> "organisational development practices"

Years	KM-OE	KM-OL	KM-OI	KM-OC	KM-OE-OC	KM-OE-OI	KM-OL-OI	KM-OL-OC	KM-OI-OC	Holistic
1999	Lim et al					Eskildsen et al				
2000		Mc Elroy					Carneiro			
2001										
2002				Wiig						
2003				Salisbury; Ralph						
2004	Ribeire and Khorrm	Firestone and McElroy	Gloet and Terziovski	Yang and Wan						Diakoulakis et al. *(proposition only KM-OL-OI)*
2005		Dimitriadaes		Halawi et al.					Chang and Ahn	
2006			Thornhill	Sung , Yeh et al.			Basadur and Gelade			
2007			Jensen et al.; Lin					Yang		Morales et al. *(from "Personal Mastery" not KM w/ OL-OI)*
2008	Yang		Chang and Lee	Boumaraif and Jabnoun; Kasim; Ho,Hsu	Waddell and Stewart		Liao et al.		Rhodes et al.	
2009		Massinghaam and Diment	Hu et al; Jiang and Li ; Cantner et al.	Moffett and McAdam	Akdere			Liao and Wu; Minonne and Turner		Heisig (Review of 160 KM frameworks)
2010			Ling and Nasurdin	Chawla and Joshi; Tsung; Zhang et al.		Hung et al; Storey and Kahn	Liao and Wu		Vaccaro et al.	Zheng et al. *(Structure-Culture-Strategy-KM-OC)*
2011	Handzic		Grimaldi and Rippa; Lee et al.	Mills and Smith						
2012			Zhi-ze and Shuang-liang; Kumar and Rose; Chaston		Yusof et al			Lee et al		

1

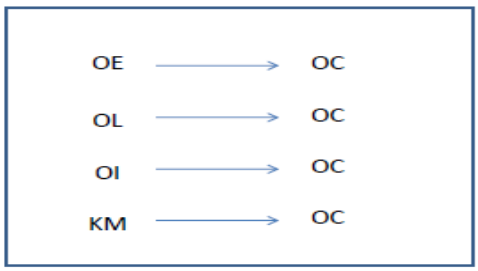
The positive KM influence over the four prevalent organisational development concepts that have been repeated in the literature reviewed are reflected in Figure (2-2a) and illustrated in Table (2-2) where the publications of reference before the solid line present a summary of bi-relation work dominating most of the KM influence in the body of knowledge.

Figure (2-2a) illustrates the positive KM influence over the four prevalent Organisational Development concepts as established in literature.



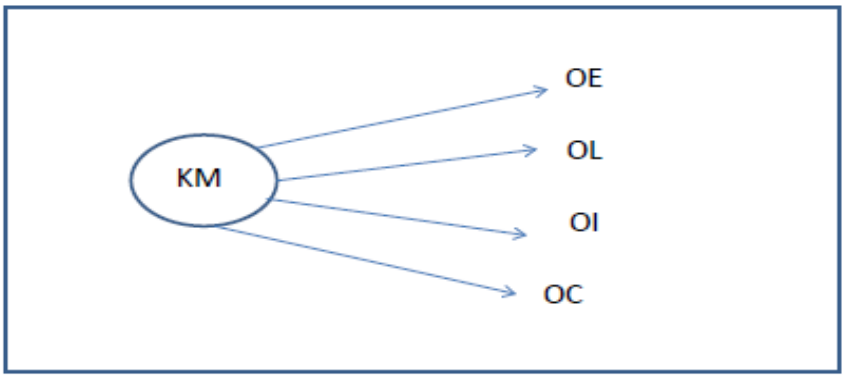
The macro picture of the literature reviewed shows that most work supports the relations between the three prevalent organisational developments practices and KM that would influence organisational competitiveness (OC) as per Figure (2-2b).

Figure (2-2b) illustrates the four prevalent organisational development practices, including KM, OC as established in literature.



Despite recent advances in the literature, our understanding of the specific roles of KM in supporting OE, OL, OI and OC remains limited and in need for further investigation (Liao and Wu, 2010; Hu et al., 2009). Furthermore, all previous reviews and relationships between specifically KM and OE, KM and OL, and KM and OI have mostly been separately addressed and rarely fully integrated. Thus, the literature hasn't clearly addressed all types of holistic relations in relevance to the influence of KM towards OC. This research however focuses on the possibility of having KM initiative that would influence all the prevalent organisational development including organisational competitiveness, as shown in figure (2-2c). KM here has a positive relation with the four prevalent practices directly or indirectly.

Figure (2-2c) illustrates the literature gap found in defining the holistic relations between KM and the four prevalent Organisational Development variables, including OC.



Therefore, this research intends to address another gap that is reflected in Figure (2-2d) which illustrate the need for empirical evidence about the holistic influence on the different organisational developments practices, including KM on the competitiveness of the government organisations entities; (Mills and Smith, 2011; Carneiro, 2000).

Figure (2-2d) illustrates the second major gap in literature with the prevalent Organisational Development Concepts towards OC.

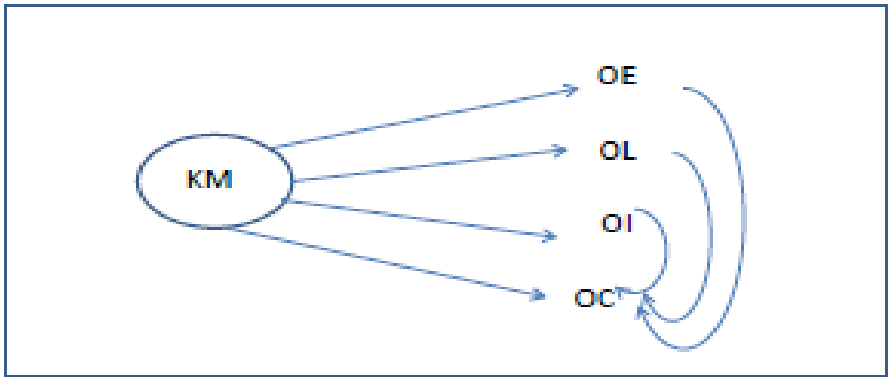


Figure (2-2d) thus shows both the main gaps thus address the *third research objective* and meet the need for understanding *the role of KM influence on the government organisation competitiveness.* Most research reviewed did not address "how" KM practices directly influence towards organisational competitiveness in GO's setting. This makes a demanding need to explore the applicability of such KM models in GO's context considering the raising costs of service delivery and the consistent shrinkage of resources. This brings importance to the possibility of integration through holistic approach when addressing the

need for organisational development initiatives in GO's not only in GCC countries but beyond, for example in India and other developing countries (Chawla and Joshi, 2010). In a knowledge based economy, GO's are expected to seek adoption of initiatives that would integrate KM with other notably development programs, such as OE, OL and OI are just examples, which might lead, together, to a better organisational value as organisational competitiveness in a better and more ensured way (Dimitriades, 2005).

2.8 Conclusions

This chapter reviewed the current literature and identified research issues that determine the literature gap and address absence of holistic theoretical models. The literature on the influence of KM shows that most work done is relevant to relations between KM with only one or two prevalent organisational development practices, justified by the practices integration being a new research area. Thus the research and critical review of the literature emphasised that the holistic link between KM and the prevalent organisational development practices need a defined set of components that can be tested for possibility of their integration. The reviewed literature in this chapter has also assisted in communicating and sharing the conceptual framework and the methodology guiding this study.

The detailed and focused literature review helped address the basic need for the three research objectives. The *first objective* is clarified through understanding the two main concepts that build the conceptual framework; i.e. KM and the prevalent Organisational Development Practices (OE, OL, OI and OC). The literature reviewed in relevance to KM influence frameworks clearly showed the lack in holistic relation of four or more prevalent organisational development practices that would address the *third objective.* This specific type of research showed the level of organisations, specificity of the GO's and the type of management team that can be involved in such project. The specific review of government sector organisations relevant to the subject had helped address the *second objective* and set the basis for future empirical work. The importance of integration between the different organisational development practices through better holistic KM influence towards OC was studied in detail.

Reflecting the literature reviews presented above, currently the absence of proper empirical research makes a significant barrier towards calling for adoption of KM initiatives in organisations. As a result, the next chapter presents the development of a conceptual framework that links KM to all specified prevalent organisation development practices taking into consideration the applicability of such initiatives and/or practices in the GO's context.

Chapter Three- Setting the Conceptual Framework and Hypothesis Testing

3.0 Introduction

The literature review of the relationship between Knowledge Management (KM), Organisational Excellence (OE), Organisational Learning (OL), Organisational Innovation (OI) and Organisational Competitiveness (OC) was presented in previous chapters along with the research questions. In this chapter the hypotheses are established in order to examine the proposed relationships. The development stages of the *research problem statements* are linked to the *conceptual framework and the hypotheses.*

Following Chapter Two, this research is based on the main gap found in the literature review findings that can be summarised as the difficulty to use current KM frameworks to address the holistic needs for the organisational development practices. In this chapter, the relations of the specified five organisational developments practices: KM, OE, OL, OI and OC are set to address the research problem, presenting the research questions and hypotheses. Reflecting on the work presented in the previous two chapters, the outcome of this chapter then forms the appropriate research design needed for the study. To better understand the consequences of KM influence, a novel framework is established describing the causal relationships between KM and its relevant organisational development practices as per the literature and as per readily available theories.

3.1 Setting an appropriate research framework components

The research model framework would be a graphical illustration developed in a sequence of events by which the constructs of the study namely the prevalent organisational development practices KM, OE, OL, OI and OC would be explained. The proposed framework should explain the world of KM, its relationships and principles of how these elements interact (Heisig, 2009). Based on research exploring 160 frameworks, Heisig

(2009) concludes that there are three type of frameworks; either prescriptive, or descriptive, or Hybrid frameworks. Prescriptive framework provides more on what is the direction of the KM practices, but do not provide details of how they can be established. While descriptive frameworks describe KM attributes, for example their influence on the success of certain initiatives. Hybrid frameworks are a combination of both prescriptive and descriptive. This research framework intends mostly towards being descriptive where the model should reflect the research focus on the relations between (KM-OE), (KM-OL), (KM-OI) and (KM-OC) as justified in the literature review. Moreover, the holistic setup of the model should help study the possibility of the relationships while addressing the *research questions* with further benefit to the context of study, i.e. GO's, from perspective of having an inter-disciplinary research (Raadschelders, 2005). Hence, a framework that is focused on the constructs relationships of KM, OE, OL and OI towards organisational competitiveness would help reflect towards an organisational ability to learn and be innovative (Davenport and Prusak, 2000). The series of framework discussed in Chapter Two since 2008 shows that none have managed to include all organisational development variables as set in the proposed framework (Chang and Lee, 2008; Liao et al., 2008; Hsu, 2008; Rhodes et al., 2008; Massingham and Diment, 2009; Ling and Nasurdin, 2010; Hung et al, 2010; Storey and Kahn, 2010; Liao and Wu, 2010; Handzic, 2011; Mills and Smith, 2011).

As outlined in the previous section, the research *first objectives* targets to develop a conceptual model which would help study the relation of the targeted variables. Sprague (1989) confirmed that a useful framework needs to be comprehensive in accepting and validating proper definition of dependent and independent variables. Therefore, the dependent variables (OE, OL, OI and OC) were set in the framework as a function of the independent variable (KM). The framework definition helped preserve the accuracy of the measurement scale for the variables mentioned above, where each of the variable's indicators was extracted solely from the literature based on the work of previous researchers (Al-Alawi et al., 2007; Davenport and Prusak, 2000; Nonaka and Takeuchi 1995). Most previous research studied proposed to establish a relation between KM with any of the organisational development variables thus creating a value of the organisation

towards reaching the status of OC. This raises the perspective of a holistic approach framework, where the KM value is represented by its influence, and would be challenged to see if this presence would lead to OE or OL or OI and in the same time achieve OC.

3.2 Hypotheses and Research Questions

In this section the constructs of the framework are presented in reference to the work carried in Chapter Two. Kumar (1996) mentioned the main process of formulating a research problem consists of the use of concepts and the construction of hypotheses. Many studies have recognized the relations of prevalent organisational development practices in this study with KM separately (Lucas, 2010; Phusavat et al., 2010), hence the researcher had no purpose to exclude applying the same relation in the context of government organisations. Therefore the proposed model discussed in Section (3.1) highlights the major factors that intensively explain KM influence on the four prevalent organisational development variables. The following hypotheses are part of addressing the *first research objective* where the framework is developed based on the gaps of the body of knowledge and the literature reviewed in context of government organizations. Reference to the sub-sections of 2.4 and the reviewed literature, the knowledge management practices with organisational competitiveness, organisational excellence, organisational learning and organisational innovation practices are set in a proposed model that highlights the major factors in the context of government organizations.

Organisational Competitiveness (OC) as per Senge (1990) sustainable advantage results in organizations exist when people learn faster than their competitors do. Drucker (1991) seen that without knowledge and the organisation having the ability to continuously create it, disseminate it, and embed it again in the organisation it would not be able to compete. Even the latest research shows that without knowledge acquisition, conversion, application and protection organizations can't perform well (Lee et al., 2012). Thornhil (2006) and Chua and Goh (2008) proposed for GO's this type of relation need to be empirically tested as it fulfils the need for better productivity through enabled service differentiation. Section 2.4.1 in Chapter Two covers the details of this review and gap that led to this proposition.

Therefore, this research hypothesizes the following:

H1: Knowledge management is positively associated with Organisational Competitiveness (OC).

Different research had been associated with KM practices being a value discipline where customer intimacy, product development and operational excellence can exist, based on its ability to create efficient internal operations, however this type of *Organisational Excellence (OE)* rarely can be found in the area of government organisations specifically (Zack et al., 2009). Through KM, OE creates resource based practices that enhanced both tangible and intangible assets and create dynamic capability (Teece, 2000). Within the environment of OE, KM is seen to have the ability to produce several benefits for excellence strategy (Lim et al., 1999). Availability of KM reduces the loss of intellectual capital, the cost of developing services; while making knowledge accessible to all employees thus increasing employee satisfaction (Yang, 2008). As per Akdere (2009) knowledge is considered an integral part of many excellence programs to achieve continuous improvement and better performance. Hung et al. (2010) see that the strong link between KM and OE is based on the organisations experience and its ability to effectively use knowledge, correct errors, and apply this knowledge. The fact KM been thought to enhance OE comes from its ability to create cultural change through introducing a new management style into the organization and encouraging knowledge sharing and decision making. KM needs prevalent practices similar to OE since it depend heavily on the top management commitment, requires organizational changes and is flourished with the use of knowledge on customer focused programs. The government organizations excellence reflects the availability of a system where quality requisites of products and services is a priority which is maintained through customer satisfaction practices, process management and resource optimisation followed by social responsibility practices (Castilla and Riuz, 2008). More detail on critical review of this relation is discussed in detail in section 2.4.2 of Chapter Two. Then, this researcher hypothesizes that:

H2: Knowledge management is positively associated with Organisational Excellence (OE).

KM in order to sustain, it creates a cycle of continuous *Organizational Learning (OL)* that emanates into different types of practices (Akdere, 2009; Davenport and Prusak, 2000). From literature review, KM will affect OL positively creative due to enhancing the knowledge process capabilities that create, transfer, and use knowledge (Malhotra, 2004). KM processes as per Maden (2012) can mediates between KM infrastructure (i.e. collaboration, learning culture, and IT support) and OL. Therefore, in order to transform GO's into OL, they need specific climate and this would lead to KM practices. Aside from this, most of the research reviewed and even latest ones debate that the presence of the KM practices would lead to this learning climate (Chawla and Joshi, 2012; Pun and Balkisoon, 2011). Section 2.4.3 in previous chapter covers in detail the latest reviews on the relation between KM and OL, however the literature still shows paucity in this area of GO's again. Then, this study proposes the following hypothesis to be explored in the context of study:

H3: Knowledge management is positively associated with Organisational Learning (OL).

Having discussed the potential relations between KM and the previous prevalent organisational development practices, one cannot ignore the developments in literature over the past few years about the relation of knowledge economy and *Organisational Innovation (OI).* Sung (2006) was one of the earliest whom believed that such relation created mounted pressure on many organizations to acquire KM capability that would lead to proper innovation management. Many authors have acknowledged that successful innovations need knowledge-intensive organisations (Hung et al.,2010; Cantner et al. ,2009; Chen and Haung, 2009). The availability of an organisation's K-Assets requires continuous innovation to survive. Given the wide range of KM tools available, organisations are racing to revolutionise their approaches to utilise knowledge for innovation (Liao and Wu, 2010;; Jensen et al., 2007). Effective KM has been presented in the literature as one method for improving innovation and performance (Hu et al., 2009; Swan et al., 1999). KM practices therefore keeps innovation from being stagnant and push it to adjust to response to

changing environments and market conditions (Storey and Kahn, 2010; Jiang and Li, 2009; Chang and Lee, 2008; Liao et al., 2008; Lin, 2007). However, the literature is still under addressed when it comes to such relation in the context of GO's (Chua and Goh, 2008). In reference of the detailed discussion of the KM-OL relation in section 2.4.4 of the earlier chapter, this study proposes therefore a fourth hypothesis which is discussed to address the gap of such relation in GO's:

H4: Knowledge management is positively associated with Organisational Innovation (OI).

These hypotheses would participate in addressing both the framework testing and development besides the *first and second objectives* earlier addressed in Chapter One. In order to bring the entire necessary research components in a generalise model, careful consideration of knowledge outcomes from the literature projections and impact of relationships was established. The framework moves the research towards connecting the relationships between different concepts that would establish evidence to support the need for the research questions. The conceptual framework was evaluated for completeness and unity for being comprehensive in reflecting the dependent and independent variables. Therefore, the proposed framework shows the linkages and influence flow of KM over the four identified organisation developments reflecting the established relations in a comprehensive process. The next step is to fully operationalise the conceptual framework.

In order to gain an understanding of recursive ability of the KM influence on the four prevalent development practices (OE, OL, OI and OC); the four hypotheses are set to derive the main components of the framework thus addressing the possibility of the positive relation with KM. Since the primary research focus is on the holistic relation between KM practices and organisational development practices, the significance of this relation need to be studied in detail. The framework considered in Figure (3-1) is established to enable the KM influence on different parameters in the constructs for the main variables OE, OL, OI and OC. The links in the framework projected and predictions are made on the relationships influence on expected outcomes. Based on the conceptual framework in Figure (3-1), the

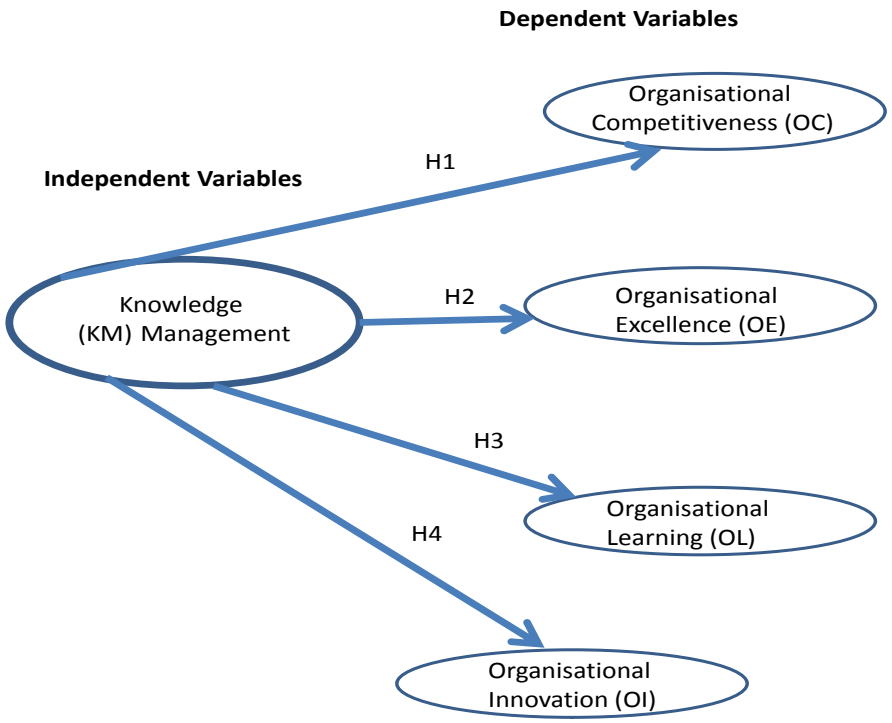
study was set to understand the different constructs that need to be investigated. Therefore, the proposed framework and synthesised data outcomes are reviewed to further develop a test or confirm the relationships between the constructs that was set in the proposed framework. These constructs propose possible practical initiatives that GO's might launch separately or in integration with each other.

Reference to figure 3-1, two focused *research questions (RQ's)* can be presented reflecting and summarising the tests that need to be carried out based on the conceptual framework thus addressing both the *first and third research objectives* that leads to the *research aim:*
First research question (RQ1) *is: Does KM influence the organisational development practices towards OC (organisational competitiveness)?*

RQ1 details are addressed by the four *hypotheses* discussed earlier in this section. This is represented in Figure (3-1).

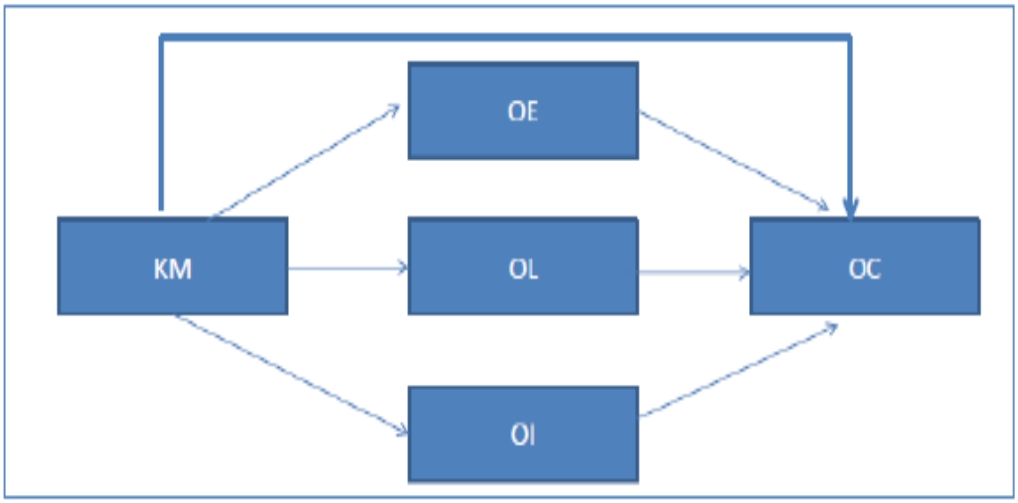
The second research question (RQ2) *is: What is the holistic relationship between the five organisational development practices (KM, OE, OL, OI and OC)?,* which need to be addressed through a model that need to be tested. This is represented in Figure (3-2).

Figure(3-1) Proposed path relations between KM and the four organisational development variables for the conceptual framework.



The framework discussed in Figure (2-1d) is also re-considered here and shown through figure (3-2) as part of the study objectives towards addressing the *third research objective* and *RQ2*. Both the integrative research models Figures (3-1) and (3-2) proposed are necessary to enhance our understanding of the KM initiatives, however Figure (3-2) clearly illustrates how the KM directly or indirectly influence OC thus creating a holistic affect. *The two RQs would remain the focus of this research where the relations of KM and OC with other organisational development practices will be examined in the context of Governmental Organisations. Also, the research plan would study the direct relation from KM towards OC in the same mentioned context.*

Figure(3-2 0)Relations between KM and OC relfecting the influence that is made from three organisational development variables towards OC to present the holistic model.



The main proposed model to be tested in this study, attempted in Figure (3-2) to contribute at the conceptual level and incorporates factors identified as having a source or practices that create a holistic influence.

3.3 Conclusions

A conceptual model has been established based on a holistic approach bringing in all possible KM influences on the different organisational development practices. Since there is a clear direction in the body of knowledge in the past one decade lacking holistic based studies that links together all the prevalent development practices, hence together, the need is clear to empirically test and explore the path model (Figure (3-1)) suitable for broad measurements.

The *hypotheses and RQs* were developed based on the gaps discussed in Chapter Two and the extensive analysis of the concepts in literature. Furthermore idea of scales suitable for the framework started to develop from these sources, but needed to be carefully selected to suite the context of the study. In Chapter Four, the research methodology will be discussed

to study the *hypotheses* and find specific answers to the queries raised by the *two research questions (RQs).*

Chapter Four – Research Methodology

4.0 Introduction

This chapter present the *research methodology* based on the study *aim* and the conceptual framework discussed in previous chapter. With reference to Figures (3-1) and (3-2) discussed at the end of previous chapter; the *research objectives, research questions, the hypotheses* along with the *research problem* and *aim;* shaped the planning stages for the research methodology. An explanation of various *research methods* is presented showing the basis of survey, the data collection and analysis processes.

Based on the *research objectives* and *hypotheses*, the researcher studied the relation between the main concepts, hence the research strategy was developed utilising the most suitable research approach (De Vaus, 2002). The research strategy started with a screening survey at the beginning of the research journey, followed by a main survey scales set up retrieved from the literature. In order to enhance the study instrument validity and reliability the researcher taken steps in approving the main survey through experts review and a pilot survey. To minimise any potential bias the whole GO's decision makers population been randomly approach through an assigned coordinators for all government organisation in the Kingdom of Bahrain. Having coordinators motivated the decision maker for participation and ensured the effectiveness of the process and data collected.

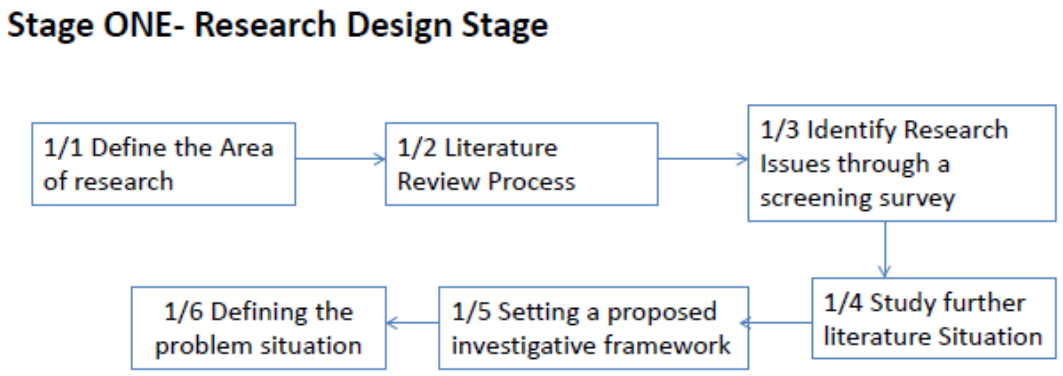
4.1 Stages of Research Design

While empirical measures describe how people concretely measure specific variables, Neoman (2003) considers that the researcher must first conceptualise a variable, giving it clear conceptual definition. Then, based on the indicators chosen, the framework should be tested in the empirical world. For this purpose to be put into reality; this section shows the five research stages and the sequence of methods used. Procedures were established for all stages to ensure that the research methodology made the empirical work effective and efficient.

The *analysis plan* is linked to the conceptual framework developed, where *research questions* guide the research process (Zikmund, 2003). The *research objectives and questions* are repeated here for ease of reference and it is considered the keys to designing the *research analysis plan* as can be seen in Figure (4-1) (a-e) series and Table (4-1). The research analysis design mainly address whether KM has an influence on the organisational development practices towards OC and to understand the holistic relation between the five organisational development variables (KM, OE, OL, OI, OC). The validity and reliability tests are meant to examine the research instrument suitability for answering the *research questions* (De Vaus, 2002). The scope of the survey was set to examine the collected data from government organisations that would help study the relevance of the KM influence on organisational development practices (specified here as organisational excellence, learning, innovation and competitiveness). The following sections would discuss how the adopted research methodology would be utilized in the various research stages.

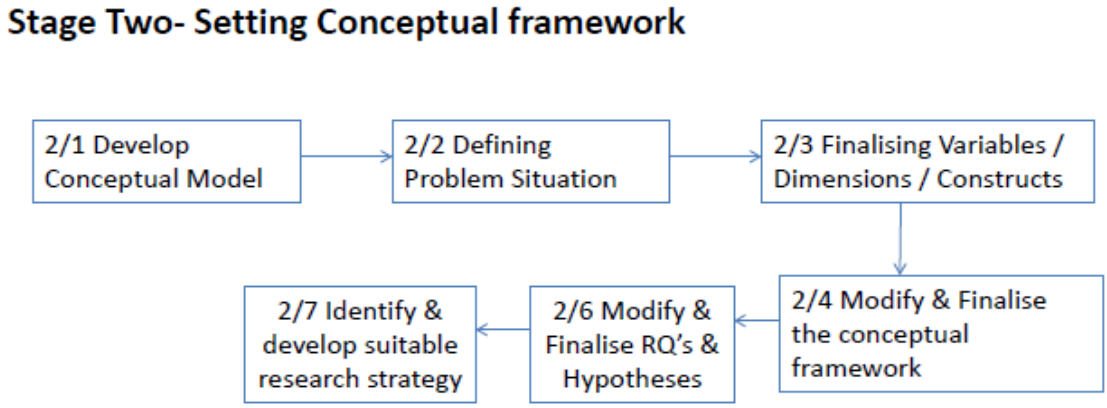
Stage One of the research design attempts to answer the (what) of the research by understanding the research scope starting with a proposed investigative framework that leads to defining the *research problem* (Bryman, 1989), Figures (4-1a) presents the steps executed and the methodology followed by the researcher from the beginning of the research journey, thus helping to link the literature reviewed and the gradual development of the framework.

Figure (4-1a) Steps taken during stage One for establishing the research design stage.



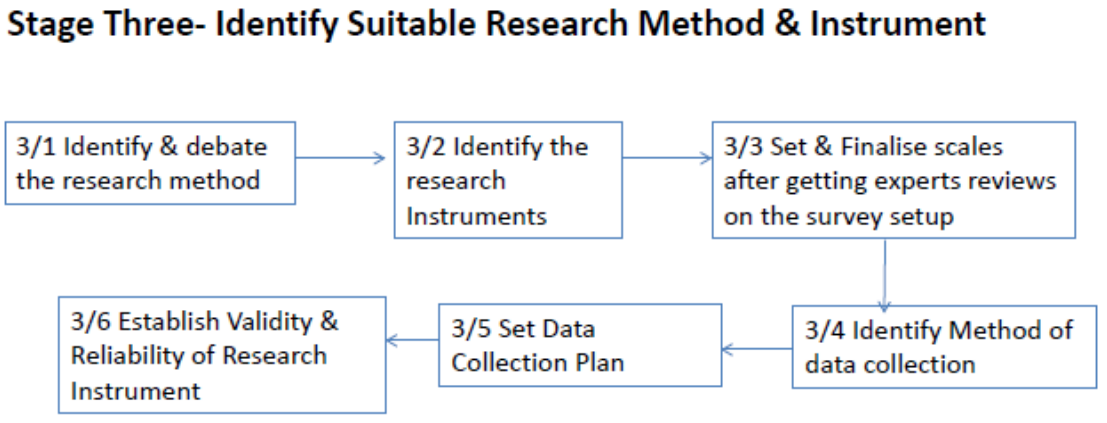
Stage Two attempts to address the development of the conceptual model to the development of a *research strategy*, subsequently the *research questions and hypotheses* lead to the final framework as Figure (4-1b) previously covered in detail in Chapter Three.

Figure(4-1b) Steps taken during stage two for establishing the research conceptual model and research strategy.



The ***Third Stage*** the research, which is covered in Chapter Five focuses on identifying the research methodology, instrument and data collection method, as reflected in Figure (4-1c). This chapter is largely dedicated to discussing this stage where the *research methods* are explained.

Figure(4-1c) Steps taken during stage Three for establishing the research methods and instruments.



The ***Fourth Stage*** focused on establishing the validity and reliability of the research instrument and ensures proper data processing, Figure (4-1d) as will be discussed on Chapter Five addressing specific procedures for questionnaire development and data cleaning. Although this stage may seem short, however it is an essential stage for reliability of the research results.

Figure (4-1d) Steps taken during stage Four for establishing the Data Collection stage.

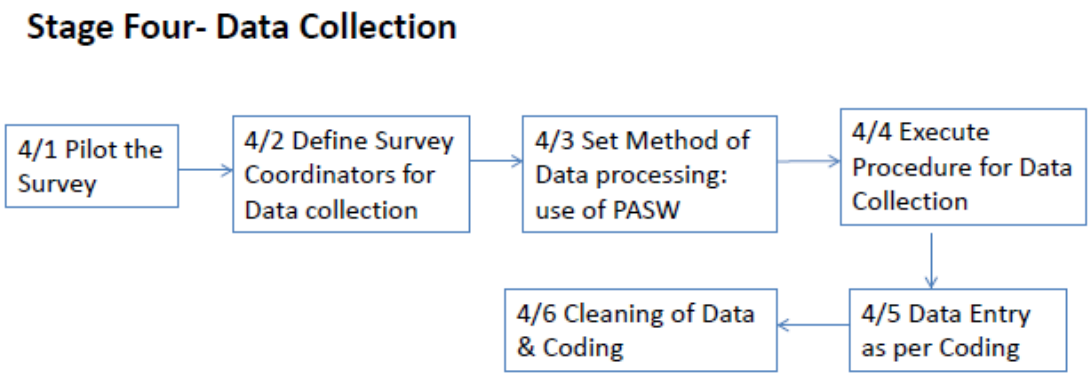
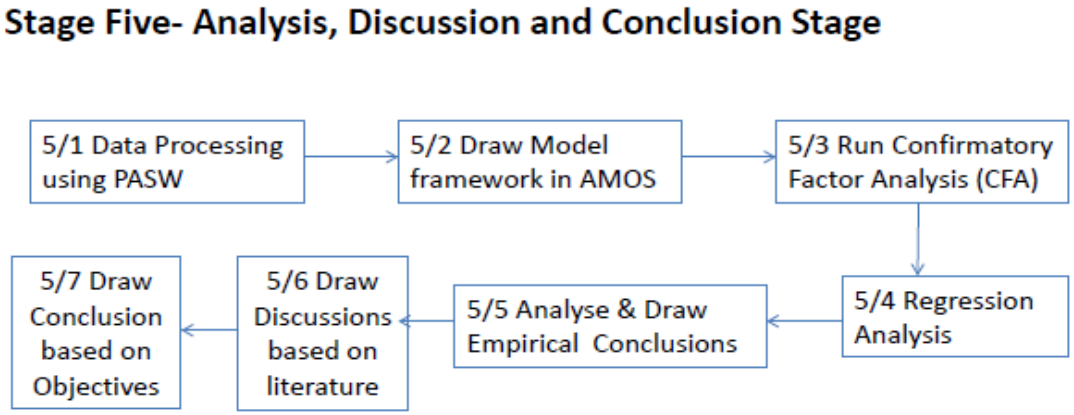


Figure (4-1e) illustrates the ***Fifth Stage*** where data analysis was undertaken using Univariate, Bivariate and Multivariate analysis where it ends with using and reporting the results of regression and CFA. At this stage the discussion of the results would be done through comparison between the *research outcomes* and *research objectives.*

Figure (4-1e) Steps taken during stage Five of establishing the Data Analysis linked to the discussion and final study conclusion stages.



Reference to diagrams above, this chapter will cover part of the steps taken during stages One, Two, Three and part of stage Four in order to select appropriate research methods (Bryman, 1989). However, most of stages Four and Five will be discussed in detail in Chapters Five, Six and Seven. Researchers believe that the process of selecting the research methods is very important, since if well applied, it can assist in better understanding the *research problem* being explored (Alavi and Leider, 2001; Babbie, 1998).

4.2 Selecting an appropriate Research Methodology

Reference to the previous research design stages, selecting an appropriate research method was the third stage as presented in Figure (4-1c) where relationships among the variables in the research framework at this stage would be tested after specifying the measurement instrument (Dooley, 2000). The researcher as mentioned in Chapter One, examined the type of research methods used in the previous KM influence literature, and based on this result nature of this research survey method was chosen. The relationships among the variables would be based on independent and dependent variables and this would be confirmed based on analysing the data. In order to study the influence of previous KM on the practices (OE, OL, OI and OC) the relations between these variables would be explored, which emphasises the holistic approach of the proposed model (Zikmund, 2003).

This study followed experimental approach which allows causality between variables while testing one hypothesis for many organizations, as compared to case study approach where only one organisation is tested at a time (Patton, 1987). The data collection stage was fixed to be all at one point in time (cross-sectional). The survey method investigated the relationship between the variables under study therefore would help in understanding the variation of the KM influence on the organisational development in GOs as a phenomenon or a situation. No historical review was set in the survey, since analysis of the past is not needed as per the objectives of this research (Zikmund, 2003).

In order to meet the fourth step in stage Two research design, the methodology used towards establishing the survey entails establishing the highest degree of reliability before it being launched. Hence the following steps would be a pre-requisite to meet the Second Stage demand:

1- Finalise defining the conceptual framework as per the literature review.

2- Extract and modify scales, where possible, from well-established papers developing the questionnaire's dimensions and constructs; following (Devellis, 1991).

3- Pilot the survey, in the context of study, with feedback used for further improvement of the questionnaire. This was done after confirming the research approaches.

4.2.1 Research Approaches as per Conceptual Framework.

Before selecting the methodology the conceptual framework was carefully examined in a broader sense, while noticing the characteristic features of KM and the organisational development variables. The conceptual framework was reflected into the initial design of the methods. The research *design plan, structure and strategy* of investigation were conceived to obtain answers to *research questions or problems* (Kumar, 1999). This later reflected in procedures that attempted to answer questions validly, objectively, accurately and economically. The following sections in this chapter discusses about the procedures used as research methods suitable for this study and scope. Hence, the operational plan in this chapter is undertaken to support conceptualising the research. From the five approaches that support conceptualisation efforts one approach would be chosen; i.e. the classical

(positivist), the interpretive (post-positivist), the critical social science, the feminist and the post-model, one approach would be chosen (Neuman, 2003). The positivist approach was selected, as would be justified later, where the procedure applied to the collection of various aspects of *KM influence phenomenon* should help enhance the knowledge community in understanding the subject. The application of this procedure is important for KM field of study since there is no balanced use of positivist and non-positivist research yet (Gubta and Shieffield, 2008). The reality of KM, in the context of the study was taken into consideration when identifying the relationship between variables which helps specify the methods of conducting this particular research.

4.2.2 Choosing between positivism and non-positivism approaches.

The positivist approach helps keep the *research objective* independent while being closely associated with the scientific method (Neuman, 2003). In this approach the *hypotheses* that would be subjected to empirical testing through quantitative methods would provide an objective, value-free and unambiguous interpretation of reality. However, this unambiguous interpretation depends a lot also on the proper management of the *research plan*, the survey instrument, the measurement tools used, the sampling plan, the data collection, data entry coding, and analysis of data and finally in the way that results are reported (Gubta and Lincoln, 1994).

Thus the positivism approach is argued by certain researcher to reduce people to numbers while the post-positivism approach (which is often adopted in social sciences) can be used to deal with real people and their capacity to think (Sweeny, 2000). However, the post-positivism emphasises the importance of multiple measures and observations, each of which may come up with different type of errors. An alternative to positivism is interpretivism, which assumes that the knowledge of reality is gained only through social constructions. Interpretivist research does not predefine dependent and independent variables, but focuses on the complexity of human sense as the situation emerges (Kaplan and Maxwell, 1994). However, for this research it was found that it would be more suitable to adopt just a positivist approach since it can address the *research hypotheses*.

The positivist approach also addresses the type of knowledge which is based on sense, experience and positive verification. Through this approach the attitudes and behaviours of individual can be measured. The study applied a positivist approach methodology in which a survey questionnaire was used to obtain quantitative data to test *hypotheses*. Data for this study was collected from employees of upper and middle management.

4.2.3 Quantitative vs. Qualitative Methodology

Reaching the Stage Three of the research design, the difference between quantitative and qualitative research methods was analysed to select the most suitable method when deciding on proposed causal explanations that help make predictions. The qualitative research, representing the interpretive science in search of subjective meanings targets to build better understanding of the practical experiences found out in the scope of the defined *research objectives* (Bryman, 1989). However, there are many reasons why researchers use the qualitative research, including where research cannot be carried out experimentally for practical or ethical reasons; or due to informal and unstructured linkages and processes among others (Jankowicz, 1995). Since this research need data that can be structured and bound due to people behaviour, thus quantitative research was used. Hence, a structured attempt is required to understand the perceptions of the participants about a particular situation.

Quantitative research seeks to explain and predict what happens in the social world searching for regularities and causal relationships between its constituent elements' thus providing a generalisable holistic view of the field, utilising larger sample sizes (Creswell, 2003). This methodology helps testing hypotheses derived from theory through collecting data related to frequency of occurrence and testing of existence of relationships between variables of interest. This approach under deemed to be the most appropriate to test almost all targeted GOs in the text of study before trying to generalise the findings. This should help build up the inferences about the quality of specific attributes in a population based on measurements derived from a sample. This would help address the design of research

framework based on the change and effect that independent variables would have on the dependent variables (Denzin and Lincoln, 2000; Kumar, 1996). The quantitative methodology thus in this research was decided to address precise feedback about the perceptions on the influence of KM leading to GO's competitiveness. This research methodology is consistent with previous work in the same area of study where mostly quantitative research approach was chosen (Boumarafi and Jabnoun, 2008; Al-Alwai et al., 2007; Migdadi, 2005; Syed-Ikhsan and Rowland 2004).

Quantitative analysis requires a detailed and quantified description with precise measurement to be accomplished. The survey instrument was assembled, pilot tested and sent to a predetermined population using Likert scale (Neuman, 2003). The survey questions were around the variables and the surveys returned were statistically analysed to identify major research themes and detect or extract the constructs they employ. The numerical data was examined to avoid any biased where possible. The data presented must be in concrete, pure numbers in order to compare with previous contributions of similar work in the field of KM. Even though the quantitative method provides useful and in-depth information, the bias in the results is still a possibility. Triangulation of interviews with the survey was found not to add much value to this research since it will not make a good representation of the scope, besides it being not feasible and time consuming considering the size of the targeted population where the participating organizations are large in number. Therefore, this confirms again that positivist quantitative approach to be the most suitable for this research. The data collection, analysis and way results are analysed and then reported helped deliver the purpose of the phenomena (De Vaus, 2002).

4.3 Basis for the Analysis Plan

After choosing the quantitative approach, it was appropriate to link the data analysis plan with the main research questions (Neuman, 2003). The analysis to be done was based on the type of data that came from the research questions that addressed all issues of this multi concept study. Table 4-1 was set based on both the research questions and the sequence of the methods used in Chapters Four and Five. The plan shown in Table (4-1) links the type

of research question in comparison to the data and type of analysis required. In order to justify the use of the survey questionnaire throughout the research and secure good research output, an explanation of the study *aim* with potential participants was set through the survey coordinators in each Bahrain government organisation as part of the procedure to support the quality of the data collected, following Kumar (1996) recommendations.

Descriptive statistics followed by inferential tests were used to examine the difference between the different organisational development dimensions. The primary data were collected from the management of each GO. Data collected were analysed using SPSS, where the data was first coded and entered into a data file. The frequencies, minimum and maximum scales of all items measured in the questionnaire were then computed to ascertain level of respondents reaction on the items (Devellis, 1991).

In order to address the *first research question (RQ1)* which targeted understanding whether KM influence the organisational development practices towards OC (organisational competitiveness), Cronbach alpha and cross-correlation were used to assess the reliability and validity testing as a preparatory step. The mean and standard deviation were also used to summarise all survey answers relevant to the five organisational development variables which would help understand the central tendencies (means), the variability's or dispersions, i.e. standard deviations and ranges (Dooley, 2000). In order to gain a broad overview of the KM and other organisational development measures in the respondent sample, frequency counts and percentages were calculated. In order to address relations issue between the five variables, Pearson's r statistical index and Spearman correlation coefficient were used to describe the degree of strength and the direction of relationship between the different survey sub-sections.

Table (4-1) Linkages between research questions and type research methods used.

Purpose	Analysis Needed
Understanding the type of data collected and general distribution of the sample	1-*Descriptive statistics* to describe main features of collected data quantitatively. 2-*Inferential tests* to examine and infer statistical significance T-test for independent samples to examine difference between different organisational development dimensions between 2 types only; using One-Way ANOVA to examine difference between three or more groups. 3- *Exploratory Factor Analysis (EFA) using PCA* to summarise the data and examine structure
RQ1: Does KM influence the organisational development towards organisational competitiveness?	
1-Five Organisational Development as Perceived in Survey. 2-Understanding the current KM development as per organisation top and middle management sample representatives participating in survey. 3-Relation between KM and each Organisational Development Practice (OE, OL, OI, OC).	1-*Cronbach alpha and Cross-correlation to assess Reliability and Validity* Testing as Preparatory Step before answering the *RQ2.* *2-Mean and Standard Deviation* to summarise all the answers of the survey in relevant to the 5 Organisational Development and would check the central tendencies (means), variability's or dispersions (standard deviations and ranges). *3-Frequency counts and percentages* will be calculated to gain a broad overview of the Organisational KM Development measures in the questionnaire. *4-Pearson's r statistical index and Spearman Correlation* Coefficient will be used to describe the relationship degree of strength for the relationships between the different sub-sections of the questionnaire e.g. KM and OL.
RQ2: What is the holistic relation between the five organisational development practices?	
1) Source and type of variables that cause the KM influence with each organisational development practice (i.e. OE, OL, OI and OC). 2) Model proposed fit.	1- *Simple and multiple regression used for testing the hypotheses* 2- *Confirmatory Factor Analysis (CFA) and Structural equation modelling (SEM)* to be used for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions. 3- From both CFA and SEM, both confirmatory and exploratory modelling, meaning they are suited to both theory testing and theory development.

The *second research question (RQ2)* targeted whether there is a holistic relationship between the five organisational development variables (KM, OE, OL, OI and OC). Simple and multiple regressions were used to test the hypotheses, followed by Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) to test and estimate causal relations using a combination of statistical data and qualitative causal assumptions. Therefore the data was then subjected first to univariate analysis (one variable analysis). Through the compilation of a range of frequency tables it was possible to show the general characteristics of the respondents. Since the univariate analysis could not tell enough about the relationship between the variables, a bivariate analysis was carried out. Bivariate analysis examines the association between two main variables; the approach was used to determine the possible links between the independent variable, KM-practices, and the dependent variables showing the four organisational development practices: OE, OL, OI and OC (De Vaus, 2002). This was followed by the multivariate analysis as discussed earlier to complement testing the hypotheses and model fitness.

4.4 Data collection plan.

This section describe the data collection plan reflected in Stage Three of section 4.1 that reflect the work done in this chapter, part of Chapter Five. The data collection is designed to ensure the validity and reliability of the measures, as well as ensure the survey is users friendly (Flynn, 1990). The pilot test performed for the survey is in order to establish the highest degree of reliability. The questionnaire was pre-tested using a sample from the top and upper middle managers in different GO's from within the Government of Bahrain. Work done relevant to selecting the data collection methodology and the demographic characteristics of the study population played an important role in defining the details of the data collection step. The decision was to collect the data through electronically-mailed questionnaire rather than web-based approach. There were different reasons for this decision as: ease of having it manually printed for top managers preferring paper-based documents, concepts being explained by the trained coordinators to support and encourage the participants to respond through e-mails reminders and the feel of more confidentiality.

Self-selecting or self-rating bias was taken into consideration when this methodology of data collection was chosen providing some insight into the participants' traits or dispositions, such as self-esteem, or self-consciousness (Devellis, 1991).

Choosing data collection method was discussed first with seven different government experts as well as professors from the University of Bahrain, Ahlia University and Brunel University whom had experience with government-based surveys. The research supervisor contribution played a role in fine tuning different stages and support in reaching final decision. Table (4-2) presents the stages and procedures taken for data collection over a period of two years where same targeted population, 800 Top and middle managers from GO's went through gradually (Devellis, 1991). Table (4-2) explains in details the five main steps taken for the survey design and data collection to meet the proposed research *aim.*

Series of questionnaires run by the researcher helped establish the survey and made it more focused based on the developed framework and the *study objectives.* The first *step (Q1)* screening of the GO's status helped clarify the importance of the research subject in the context of study. The piloted questionnaire helped to fine tune the fitness of the KM-OC survey for practically meeting the conceptual framework requirements. Then *final step (Q5)* came to set the survey based on the experience with all above thus helping to ensure a highly focused data collection instrument highly focused on scope, *aim* and context of study. The details of the implementation of *step (Q6)* for data collection would be followed in Chapter Five.

Each of the six steps presented in Table (4-2) represent a main technique carried by the researcher in this data collection journey. Each step carried its own procedure and targeted to ensure that the best suitable data are collected by the most suitable instruments, in the right time and from the right targeted population, so that this tool can be repeatable.

Table (4-2) Steps of Survey Design and Data Collection

Instrument / Procedure	Purpose
*Step (Q1) Screening of Context Status (**Data Collection before conceptual framework setup)***	
General feedback on the KM status and understanding of the concept	To refine the scope of the study and see its applicability to GO's in Bahrain
Step (Q2) Setting up the Scales of the Questionnaire (using the literature and surveys of reference suitable for the research scope and constructs)	
Study in detail all the types of surveys conducted in the field and retrieve from literature the necessary indicators for each construct	To ensure the novelty of scale, its validity and generalisability
Step (Q3) Expertise Panel Check of survey wording and suitability of indicators	
Pre-pilot review for the content of the KM-OC Main survey draft by seven GO's and Academic Experts.	To ensure wording, suitability and support face validity
*Step (Q4) Piloting the Questionnaire (**Data Collection to support the fitness of survey for conceptual framework in the context of study)***	
KM-OC survey Piloted	To ensure most suitable survey before it is being launched
Step (Q5) Assign Survey Coordinators	
Assign and train survey coordinators for each of the 60 Government or semi-government organization targeted in the main KM-OC survey	To ensure that the researcher distant himself from possibility of influencing the data
*Step(Q6) KM-OC Survey (**Data Collection for testing the conceptual framework)***	
KM-OC survey with final developed framework and based on the literature reviewed	Testing the proposed model on a targeted population of 800 decision makers

4.5 Preparatory stage (Data Cleaning)

Preparatory stage is about data cleaning and data preparation before running the statistical testing. One of the most important methods at this stage is to identify the missing values that occur when no data value is stored for the variable in the current observation. Missing values are a common occurrence, and statistical methods have been developed to deal with this problem, where missing values can badly distort the findings of research, hence a

decision was taken in this research to examine the missing values via a procedure that would determine the size of missing data and whether the missing data had any systematic relationship between them (Weisberg and Bowen, 1977).

Missing value analysis helps address concerns arising from incomplete data thus avoiding misleading results or reduction on the precision of calculated statistics (Jankowicz, 1995). The researcher assumed that missing cases differ in analytically important ways from cases where values are present. Since items with no response refers to the fact that due to fatigue, sensitivity, lack of knowledge or other factors, where respondents infrequently leave particular items blank on mail questionnaires, the researcher decided to impute these values to determine its use for multivariate analysis. For the purpose of understanding the frequency distribution and how the subjects respond to an opinion item; imputation was used to reduce bias and therefore address the purpose if the data are missing at random. In this research, the traditional method was used where a missing value was replaced with the mean of all values to ensure that the mean is unaffected by the new values (Zikmund, 2003).

4.6 Reliability and Validity Tests

This study deals primarily with concepts and variables. The objective was to develop clear definitions and to create measures that yield precise and accurate findings. This gives rise to the concept of validity and reliability which are used to assess how well a question, or group of questions are addressed. These two concepts are interrelated and reliability is a precondition for validity and has been addressed as the ignition for stage Four of this study research design (Oppenheim, 1992, p.159).

The researcher started work on ensuring the reliability and validity of the questionnaire early in the design stage with a number of measures taken, such as the use of multiple indicators, careful survey of GO's experts review followed by piloting stage. In this section, a detailed explanation of the statistical technique used to assess the reliability and validity of the measurement used is persecuted.

4.6.1 The reliability of the study.

Reliability refers to the consistency of the measure, the probability of obtaining the same results again if the measure was to be replicated (Oppenheim, 1992, p.144). Reliability therefore measures how much the results are consistent over time and an accurate representation of the total population under study. Reliability regarding quantitative research is designed according to (1) the degree to which a measurement, given repeatedly, remains the same, (2) the stability of a measurement over time and (3) the similarity of measurements within a given time period (Neuman, 2003).

Since the reliability declines as the length of the question increases, the questions were designed to be straight to the point using Cronbach's Alpha coefficient index as discussed in Chapter Three. As per Brown (1997), there are three strategies to assess reliability: (a) test-retest reliability (i.e., calculating a reliability estimate by administering a test on two occasions and calculating the correlation between the two sets of scores), (b) equivalent (or parallel) forms reliability (i.e. calculating a reliability estimate by administering two forms of a test and calculating the correlation between the two sets of scores), and (c) internal consistency reliability (i.e. calculating a reliability estimate based on a single form of a test administered on a single occasion using one of the many available internal consistency equations). The square of the correlation coefficient expresses the percentage of share true variance. Cronbach's Alpha test is designed to measure inter-item consistency where the closer the reliability coefficient to 1.0 the better the reliability level. Therefore, items with low reliability alpha, less than 0.5 will be eliminated (Zikmund, 2003).

A procedure for Cronbach's alpha was used to measure the internal consistency and how closely related as a group is a set of items as a group as per the research feedback. A high value of alpha is often used (along with substantive arguments and possibly other statistical measures) as evidence that the items measure an underlying (or latent) construct. However, a high alpha does not imply that the measure is uni-dimensional which might be done

through other tests as i.e. Exploratory Factor Analysis (EFA). Technically speaking, Cronbach's alpha is not a statistical test - it is a coefficient of reliability (or consistency).

4.6.2 Validity of the study.

Validity refers to the degree to which the scales measures are designed to measure. It is the degree of fit between a construct and its indicators (Oppenheim, 1992, p.160). The establishment of the validity of this research instrument can either be done through establishment of the logical link between the objectives (or research questions) and questions used in the instrument, or through statistical technique. Then, the validity is checked in relation to all questions and to the *objectives* and the *two research questions.*

There are *four types of validity* needed to be established in this research (Neuman, 1994; Oppenheim, 1992) and these are: *Face Validity, Content Validity, Convergent Validity, Discriminant Validity and Construct Validity. Face and content validity* are established by piloting construct and criterion by cross correlation. The *face validity* of survey questionnaires was carried out through government field experts and university professors. Experts were asked to comment on the lists of scale items. Moreover, *convergent and discriminant validity* are established by exploratory factor analysis (EFA). *Convergent validity* can be assessed by examining whether the factor loading of items (such that pattern coefficient) in their respective constructs are large (equal to or greater than 0.5) and statistical significant. The survey reliability and validity was assessed followed by confirmatory factor analysis (CFA) performed on the KM-OC survey data before structural equation model (SEM) testing (Hair et al., 2006). The researcher used the *discriminate validity* to show the degree to which each construct differs from another. The *construct validity* of the questionnaire was assessed by composite validity, Cronbach's alpha's reliability, average variance extraction methods and SEM to check the relationship between the constructs, (Dooley, 2000).

4.7 Descriptive Statistics Stage

The analysis chapter will present central tendencies (means), variability or dispersions (standard deviations and ranges). Frequency counts and percentages were calculated to gain a broad overview of the measures in the questionnaire where the descriptive statistics would help describe the main features of feedback and thus know how the dependent and independent variables in the study are related to each other.

The analysis methodology would go through a sequence focused on the interpretive data and the survey setup gradually moving from Nominal – to Ordinal – and then to scale-based analysis. Interpretations specifically of survey sections 1 and 2 would focus on numbers and percentages as per the data collected while section 3 of the survey using the Likert scale would help bring the interpretations on the mean and standard deviation.

4.8 Inferential Statistics Stage

The *second stage of the analysis plan* was establishing an inferential test to examine infer statistical significance of the responses to the general survey items among the groups according to the gender, nationality and management level of the respondents. The *T*-test and One-way ANOVA were the tests of choice. The T-test was used for testing the statistical hypothesis, while the one-way analysis of variance (abbreviated one-way ANOVA) was a technique used to compare means of two or more samples (using the F distribution). This technique can be used only for numerical data of the survey; where each of the above tests was selected to fit a purpose and to answer a question. Thus the T-test and One Way ANOVA is used to examine and infer the statistical significance for independent samples and the difference between three or more groups respectively. This was done to help understand the interactional and/or intersectional effects/influence between OE, OL, OI and OC of KM; which addresses the *second objective*.

4.9 Research models and methodology

The *fifth stage of the research stages* is the modelling process considered a part of a larger process, as a predictive tool in a practical application before a major decision, or as the current view of a phenomenon within a particular research field. An important step in model development is thus, to decide when a model is fit for purpose.

This section describes the methodology used to understand the relation between the chosen constructs of the model in the simplest possible way, thus exemplify the possibility of the holistic approach to KM influence on organisational development practices. The conceptualisation of the model targeted to translate theoretical assumptions into a conceptual framework and is identified based on existing literature and theory. Latent variables or constructs are chosen and then operationalised through observed variables. This would later depend on the successful development of a structural equation model which is to a large extent based on sound model conceptualisation.

As part of the SEM model, the relations between the latent variables or constructs and their questions in the questionnaire were defined. The confirmatory factor analysis (CFA) model would be used to test the covariance between each possible pair of latent variables. All the covariance's for the latent variables are assumed to be zero, i.e. the constructs are totally unrelated to each other. The proposed structural model would be investigated further through the hypothesised relations (Janssens et al., 2009). The structural model describes relationships between the latent factors defined in this study which consists of a set of exogenous and endogenous latent variables, together with the direct effects connecting them, and the error variance for these variables. Endogenous represents the dependent variables which can be influenced by one or more variable, which are represented here by organizational development practices. The exogenous which is here taken as KM reflects the independent variable that affects a model without being affected by it. The error variance reflects the effects of unmeasured variables and error in measurement (Sureshchander et al., 2002). The structural model targets to present how the exogenous latent variables are conceptualised so as to cause variance in the values of other latent variables in the model. Changes in the values of exogenous variables are not explained by

the model and they are considered to be influenced by factors external to the model. The structural model would help represent how the endogenous latent variables are influenced by the exogenous variables in the model and how they affect each other (directly or indirectly). The model specification tracks variance in the values of endogenous variables and explains how the latent variables are influenced (Kaplan, 2000).

The validation of the measurement model is accomplished primarily through CFA, while the fitting of the structural model is accomplished primarily through path analysis with latent variables. The Path analysis establish sets of relations between variables, so that the dependent variable in one equation becomes an independent variable in another which helps study the direct and indirect effects of independent variables on dependent variables (Lleras, 2005). However, traditional path analysis does not formally adjust the coefficient of each independent variable for an estimated measurement error. The researcher proceeded to the development of the structural model only when the measurement model is validated. Two or more alternative models (one of which may be the null model) are then compared in terms of model fit, which measures the extent to which the covariances predicted by the model correspond to the observed covariances in the data. The researcher may use modification indexes, suggested by the analysis software to alter the model specifications to improve the model fitness if supported by the literature review and the best practices of framework management, i.e. Chapters Two and Three.

Based on the construction of the conceptual framework with the four underlying proposed hypotheses, the research seeks to investigate the influence of KM on the GO's competitiveness. Since the *aim of the study* is to ***investigate the influence of KM on three prevalent organisational development practices in a government setting and the influence on organisational competitiveness,*** through empirical evidence; an in-depth rigorous hypotheses testing of the conceptual framework was applied to address the variances with regards to the organisational competitiveness (OC). Since this research scope is not concerned at the causality of why OC occurs, but rather how it occurs, a series of multi-regression analyses with structural equations were applied (Dooley, 2000). Using path analysis, the researcher measured the latent variables of interest through multiple

manifest variables in order to get better measurement, accommodate for measurement error and statistically compare alternative models.

4.10 Multivariate Statistics Stage

For the *hypotheses* testing, two statistical techniques have been employed in the *fifth stage of the research design:* simple regression analysis and multiple regression analysis. Several statistical approaches might be explained by the fact that most of the studies in strategic management have used regression analysis to test the hypothesised relationships (i.e. Papadakis, Lioukas and Chambers, 1998; Elbanna and Child, 2007; Goll and Rasheed, 2005). Linear regression models often enter variables in a purely additive way, and thereby the resulting estimates concern effects of a single variable in isolation. The estimated effect may not clearly describe the effect of the variable interacts on other factors, and is therefore context independent.

Regression analysis was employed to have the mix of continuous and categorical independent variables. By employing these statistical analyses, the researcher attempted to have a holistic understanding of the nature of causal relationships. In addition, the researcher attempted to achieve a robust methodological approach. The results from the analysis would provide a clear understanding of the factors that influence KM in GOs. Modern approaches to data analysis stated that hypotheses often do not precede the data. Some social scientists (Blaikie, 2003) believe that the ordinal-scaled data based upon a Likert-scale could be converted into a form of interval-scaled data, (Tabachnick and Fidell, 2007). Sections (4.10.1) through (4.10.5) present the techniques adopted for examining the survey data, and hence taken for the study hypotheses.

4.10.1 Hypothesis Testing through Regression Analysis

Regression is used to examine the relationship between variables especially the extent to which a dependent variable is a function of one or more independent variables. It is used to analyse the relationship between a single dependent variable and several independent variables where the values of one are used to predict the values of others (Neuman, 2003).

Thus, multiple regression analysis was used to examine the proposed *research hypotheses* and to support the prediction of an outcome from various predictors. Usually, researchers seek to ascertain the causal effect of one variable upon another (Tabachnick and Fidell, 2007).

The researcher conducted fundamental tests of the underlying assumptions for multiple regression analysis in order to ensure that the data were conducive to such analyses. The relationships between the independent and dependent variables were analysed using correlation coefficients for every potential pair of variables. Multicollinearity tests were developed using variance inflation factors (VIF) to test for the presence of multicollinearity between each of the independent variables, these tests results depend upon the values of the VIFs for all independent variables.

Multiple regressions were done by setting the model evaluation, then misspecification tests was followed by Multicollinearity Diagnosis. The data before being analyzed were first screened for problems that might affect later analyses and positively no problem was detected. Regression models were evaluated according to four tests prescribed by econometricians (Gujarati, 1992; Greene, 1993) in order to predict the appropriateness of an equation. The diagnostic tests of linearity, homoscedasticity, normality and multicollinearity were examined in order to confirm the assumptions of the regression analyses. The linearity of a regression model is based on the association between dependent and independent variables which represent the extent to which a change of the dependent variable is associated with the independent variables (Tabachnick and Fidell, 2007). For the purpose of the research, a more straightforward approach was applied; the Ramsey (1974) test (RMSEA) conducted by calculating the predicted fitted values and the standardised residuals. The detection of linearity was examined by F-statistic and its associated significant level. F statistic in most of the regression analyses was found to be low and not significant at 0.05 levels. Therefore, a linearity test confirms the appropriateness of the regression model.

The case of multicollinearity exists in multiple regression models when there is more than one predictor. One of the common approaches to detect multicollinearity is to execute a correlation matrix of all predictors and identify if they are highly correlated (above .80 or .90) (Field, 2005). For the *aim* of studying the holistic effect of the practices a more scientific approach has been implemented called Multicollinearity test. Multicollinearity can be detected by the variance inflation factor (VIF) scores and the tolerance values of the independent variables (Brown, 1991). An acceptable threshold level of a VIF is to be less than 10 and a tolerance value greater than 0.10 (Neuman, 2003).

4.10.2 Principal Component Analysis (PCA)

Principle Component Analysis (PCA) methodology is used in line with CFA applications. PCA is used for data reduction that transforms a number of possibly correlated variables into a number of uncorrelated variables called principal components where the first component will be as high a variance as possible to see the variability in the data, then, the same will be the case for each succeeding component. PCA is sensitive to the relative scaling of the original variables, through which the researcher can obtain component scores i.e., variables that can be added to the data set based on the dimensionality of the data.

PCA as a tool for predictive models can be done by eigenvalue decomposition of a data covariance matrix or singular value decomposition. Unlike factor analysis, PCA loadings onto the components are not interpreted as factors. If raw data are used, the procedure will create the original correlation matrix or covariance matrix, as specified by the user. PCA assumes that each original measure is collected without measurement error (Tabachnick and Fidell, 2007).

4.10.3 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a multivariate statistical procedure as part of *stage Five in the research design stages* that is used to test how well the measured variables represent the number of constructs. Both CFA and SEM can help in testing and estimating

causal relations using a combination of statistical data and qualitative causal assumptions (Schumacker and Lomax et al., 2004). The model is tested through CFA against the obtained measurement data to determine how well the model fits the data. Causal assumptions embedded in the model often have falsifiable implications which can be tested against the data. Unlike Exploratory Factor Analysis (EFA) where all loadings are estimated, in CFA, the pattern of loadings is fixed. Hence, the CFA procedure as illustrated in Figure (4-2) was performed as follows:

a) Define individual constructs theoretically through a pre-test, to evaluate the construct items and a confirmatory test of the measurement model.

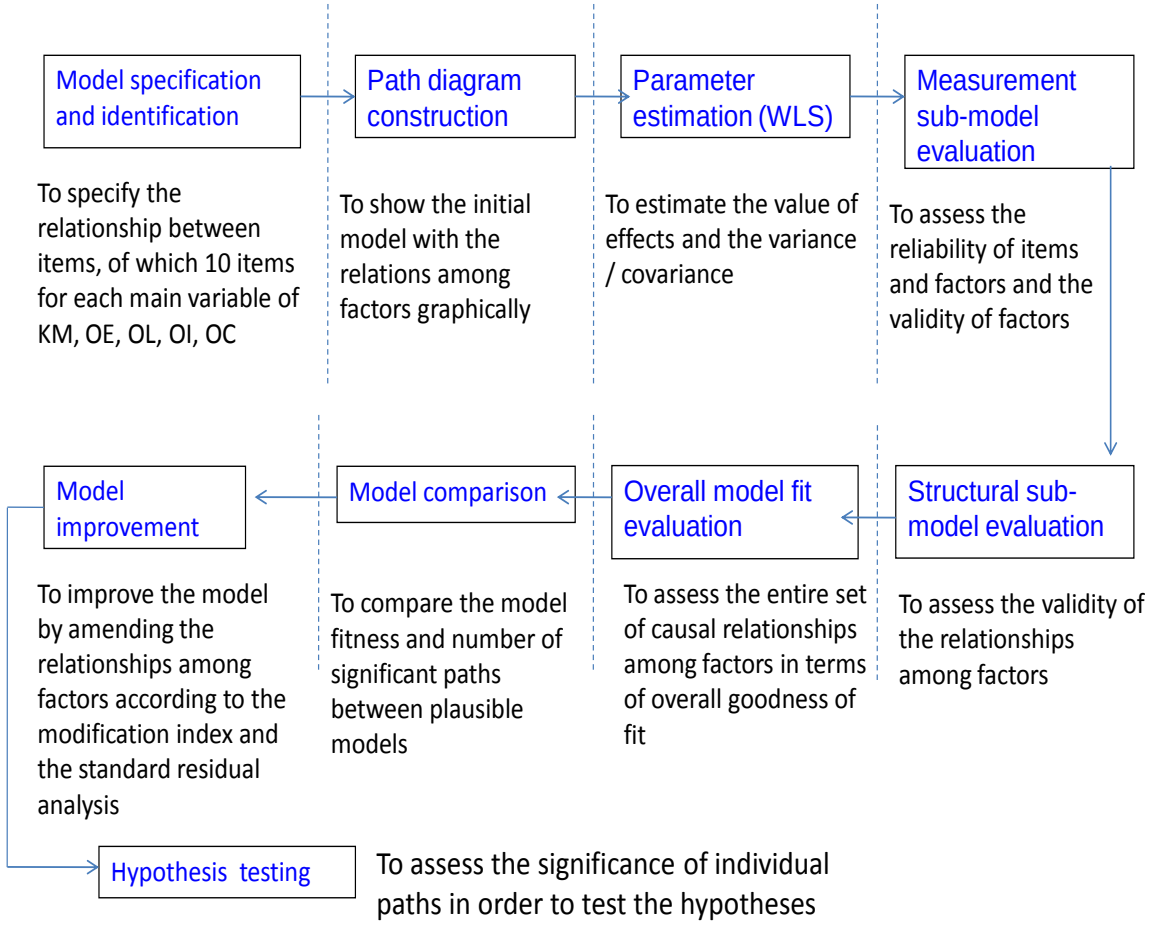
b) Develop the measurement model theory where the concept of uni-dimensionality between construct error variance and within construct error variance, where the five constructs each would have ten items (called indicators).

c) Design and specify the measurement model to produce the empirical results. This involves establishing value of one loading estimate each per one construct.

d) Assess the measurement model validity to compare it with the reality model to see how well the data fits. Here, the number of indicator where the factor loading latent variable should be greater than 0.7. Chi-square ($\chi 2$) test and other goodness of fit statistics like RMR, GFI, NFI, RMSEA, SIC, BIC, etc., are some key indicators that help in measuring the model validity. Table (A-15-1) in Appendix (15) give a guideline for the criterions used for measuring the overall model fit.

Figure 4-2 shows the summary steps of the procedure to be followed for testing the model specification till model testing and improvements to be done which fulfils part of *Stage Five of the research design stages* discussed earlier in this chapter.

Figure (4-2) Procedural Flow Diagram of SEM



4.10.4 Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) is found to build analysis for relations between variables with causal relationship. The relation between the constructs represents the organisational development where the effects between them are reflected through a quantitative statistical method that combines the benefits of path analysis, factor analysis and multiple regression analysis (Lleras, 2005). SEM is based on correlation statistics, i.e. the linear relationships between variables, and the common variance between the variables forms the basis for the analyses. SEM analyses and presents the degree of relationship between variables in terms of explained variance. SEM is more powerful to regression

which takes into account the modelling of interactions, nonlinearities, correlated independents, measurement error, correlated error terms, multiple latent independents each measured by multiple indicators, and one or more latent dependents also each with multiple indicators. SEM goes more than multiple regressions in path analysis, factor analysis, time series analysis, and analysis of covariance (Tabachnick and Fidell, 2007)..

SEM is essentially a combination of (CFA) with path analysis, as discussed earlier, and which account for measurement error in modelling the relationships between variables measured with error (i.e. latent variables). SEM would be done in two steps, step one is through developing measurement model (CFA) relating observed variables to latent variables that would examine goodness of fit of this model on its own and examine correlations between all variables (usually latent variables) of interest by looking at correlations between factors from CFA, called later in this study Model-runs. The second step was developing the full SEM. Therefore, the correlated relationships are changed in the CFA in order to impose theoretical causal direct effects between variables and drop relationships not assumed by theory as discussed in Chapter Two. These two steps should help examine goodness of fit of this model as a whole. In order to make decisions about the outputs of the CFA; uni-dimensionality, convergent validity, reliability and discriminant validity would need to be studied in detail. This is discussed in Chapter Six.

4.10.5 Assessment of model fit and model modification guideline

As discussed in the earlier section, the construction of a path diagram is necessary to the modelling development more explicit with model specification. Here, the model is specified with specific variables and how they are related. Effects are represented by an arrow in a path diagram, while null effects result in the absence of an arrow. Then, the model identification is performed through AMOS where the empirical data is investigated to see whether there is enough information in the data to do the parameter estimation. Parameter estimation follows where AMOS creates a covariance matrix based on the specified model. Since it is assumed that there is no relation between two variables specified during the model specification, the covariance is set to zero. The selection of

method of estimation is an important component of the model specification. Maximum likelihood estimation is by far the most common method as recommended by (Schumacker and Lomax, 2004).

The assessment of model fit is one of the most complex tasks of Structural Equation Modelling (SEM). The system of relationships between variables is specified by a series of equations (structural or prediction). Structural equations define the 'model' to be tested for 'fit' which is assessed generally against data and/or against alternative models. The "Fit" is a property of the system of variables (i.e., the model). The model implies a test of presence and/or absence of paths. An alternate model, called here Model-Run with different numbers, will yield a different set of expected correlations which may fit better or worse. Much causal modelling involves comparison of alternate model fit. When a model is run with and without path; Chi-square value ($\chi 2$) from each model should not increase otherwise, it is a worse fit. Since the model has a $\chi 2$ value that represents a certain degree of freedom (df), significance of 'increment' or 'decrement' in fit would be tested through alternative model, where df = df1 – df2 (Schumacker and Lomax ,2004). Therefore, model fit is related to data, model, and once the model converges and parameter estimates are presented, empirical data fit checks how well the correlation or covariance matrix will be produced (Chen et al., 2001).

Absolute fit compares the predicted and observed covariance matrices. The Chi-square $\chi 2$, Goodness of Fit Index (GFI), and standardised Root Mean Square Residual (Standardized RMR) are indicators of absolute fit. Large values of Chi-square reflect a discrepancy between the observed and predicted matrices (i.e. current vs. ideal model). The Chi-square is reported with the number of degrees of freedom associated with the model, and a significance test. Evaluating the goodness of fit of the proposed model depends on the estimates checked for admissibility. The goodness of fit measure is done also through the Chi-squared statistics to test the null hypothesis of no parameter omission with its associated number of degrees of freedom (d.f.) and p-value (Schumacker and Lomax, 2004).

The statistical power of the model goodness of fit test varies with the sample size, the larger the sample used, the higher possibility of the statistical test significance. Thus, with large samples, the model will always be rejected, while with a very small sample, the model will always be accepted, even if it fits rather badly. Thus, it is useful to use other fit measures that quantify the fit of the model namely Compared Fit Index (CFI) and also (TLI), (NNFI), the Root Mean Square Error of Approximation (RMSEA), as per guidance of Table (A-15-1) in Appendix (15). RMSEA value is often reported due to its potential for hypothesis testing and it is suggested to be below 0.05 while for CFI 0.95 is usually considered to be acceptable. All ranges are from 0 (no improvement) to 1 (100% improvement). Others type of fit indices are Non-Normed Fit Index (NNFI), Goodness of Fit Index (GFI). In this study the researcher checked the overall model fit (Tabachnick and Fidell, 2007).

Based on the model evaluation with respect to its fit, the researcher can decide whether it is acceptable or if it needs to be modified to fit the empirical data. Hence, the researcher did cross-validation of the proposed model against part of the dataset when major changes have been made to the model as a result of the model modification phase. Then, two-step approach of testing the measurement model and the structural model was used. The researcher decided earlier to follow the recommendation of not to force fit the model if it is not fit as it defies the purpose for future investigation and the spirit of the research. Table (A-15-1) represent the summary guideline set for testing the overall Model Fit

4.11 Conclusions

This chapter examined the research methodology to be applied within this thesis as part of the research process with a well-developed model. The researcher has justified the use of positivism and why the quantitative approach is the most appropriate. This Chapter reflects the types of research strategies and relevant procedures. The chapter carries two tables of reference to the rest of the empirical study journey that is a table on methodologies used as per the *research questions* and a data collection plan table that explains the sequence of the questionnaire setup till the final collection of the data. The relationships between the

various variables in this study will be analysed using correlation coefficients. Simple and multiple regressions were introduced for testing hypotheses. Regression meant to examine the relationship between variables especially the extent to which a dependent variable is a function of one or more independent variables. Structural Equation Modelling (SEM) was discussed similarly as a method to be used for the combination of Confirmatory Factor Analysis (CFA) with the path analysis.

In summary, this research seeks to investigate the role of KM practices which influence GO's organisational development practices towards competitiveness. This chapter should help in building the proper investigation for the *hypotheses* thus helps in finishing the final boundaries of the research. The research methods discussed in this chapter will be used as an important tool that acts as an action plan for the empirical data analysis done subsequently. The next chapter will cover the details of the questionnaire design, development and the data collection, before presenting the results of data analysis in Chapter Six.

Chapter Five – Questionnaire Design and Data Collection

5.0 Introduction

In continuation to previous chapter of research methodology, this chapter moves the research from the third to the fourth stage of the *research design plan*. The focus here on building a suitable survey instrument that leads to proper data collection as per the set plan in Chapter Four. The processes outlined here were followed in order not only to ensure the proper design, but even to test the validity of questionnaire. Description of the procedures used for the development of the survey scales, questionnaires design, development, distribution and collection are presented in detail. The questionnaire intends to measure the KM relations with the different organisational development practices. The questionnaire is discussed in detail while results of the scales validity and reliability tests would be discussed along with the descriptive results that cover the sample size and responses to individual items in the survey.

The first part details the processes involved in the initial design of the questionnaire including the review of previous questionnaires and the existing literature. A summary of the steps followed in testing the suitability of the questionnaire to meet the research objectives is correspondingly presented.

5.1 Considerations of KM Questionnaire Design and administration in Government Organisations

Most past decade empirical work emphasised that questionnaires are the best way to approach proper population in KM related studies (Liao and Wu, 2009; Rivera-Vazquez et al., 2009; Waddell and Stewart, 2008; Hughes et al., 2008; Andreu et al., 2008; Eftekharzadeh, 2008). Thus the literature is rich with scales trying to measure KM, or KM's relationship with other organisational issues, however these scales needed to be changed and developed as per this study's needs, and moreover, none of the previous scales were addressed in the specificity of government organizations (Marsick and Watkins, 2003; De Vaus, 2002; Oppenheim, 1992; Devellis, 1991). This addresses what the prominent KM

scholars Davenport and Prusak (2000) recommended for ensuring that KM practices scales need to fit the organizational context when addressing the competitiveness issue.

As part of meeting the *aim* of the survey, it was important to see whether and how KM initiatives can be a priority for governmental organisations through understanding its influence on other organisational development practices. The questionnaire design had to cater to all GOs types that could be participating in the survey while addressing the uniqueness of the public services (Willem and Buelens, 2007). As mentioned in Chapter One and Two, GOs have an overall uniformity in their cultural condition. Due to the limited opportunities to clarify any issues from participants, the researcher tried to benefit most from previous feedbacks and clarifications raised during the pilot surveys. Even though the survey discussed followed a strict procedure to ensure the quality of the data collected, it had specific challenges as to make it generalized beyond its application in Bahrain only. The possibility of having a low response rate, self selecting bias and participants consulting each other are disadvantages and may affect participants' willingness to respond to the questionnaire. However, the main challenge to questionnaire data quality is if respondents do not get the opportunity to understand the questionnaires or different respondents interpret the questionnaire differently. This may be overcome by collective administration of the questionnaire, and hence this has been followed. The researcher had ensured that information in each scale is straightforward and that the coordinators in each participating GO are aware of the questions they might be asked by the participants. A closed loop access from the coordinators has been created to ensure that in the event of any difficulty with questions in completing the survey the researcher is notified immediately.

5.2 Questionnaire development and design Stages

The researcher considered the nature of KM influence and thus the targeted population and sample design were appropriately set to the type and *aim* of the study. The design and development of quantitative research in the social sciences tends to operationalize the concepts, the instruments, the perceptions and the views (Bryman, 1984). The questionnaire

could have been developed either through the adaptation of a pre-existing tool or through the creation of a totally novel questionnaire. The researcher decided that the existing scales did not meet the objectives of the current research nor does it help answer the two main research questions; therefore the alternative method was to design a suitable questionnaire. The questionnaire was designed taking into account *the research objectives* outlined in Chapter Four, and a comprehensive initial version of the questionnaire was constructed based on these objectives. However, as a first stage in developing a customised instrument for this research, several other questionnaires were considered as possible research instruments (Boumarafi and Jabnoun, 2008; Al-Alawi et al., 2007; Zaim et al., 2007; Syed-Ikhsan and Rowland, 2004). The survey questionnaire was devised drawing on an extensive literature review and series of questionnaires designed from well established papers. The main tool used for the survey data analysis was the Predictive Analytic Software (PASW) from SPSS Inc. one of the most widely used, comprehensive and flexible statistical programs. The vast body of literature related to questionnaire design was consulted during the process of questionnaire design (Oppenheim, 1992).

During setting up the survey questions, the researcher tried to ensure that all were formalised for obtaining structured information from respondents. The goal was to transform the information needed (found in the gap of the KM literature review and its relevant influence on the organisation development) into a set of specific questions that the respondents could and would answer, where the questionnaire was designed in a way that would motivate and encourage the respondent to become involved while minimising the response error. On this basis the questionnaire was developed to first understand the status of the organisation, thus confirming the similarity and uniqueness of the GO's culture, and then followed by five main dimensions that represented the organisational development practices constructs. A decision on mode of survey administration was taken after reviewing the questions to assess its face validity. Seven senior government officials, along with the research supervisor, called here the expert, were first asked to evaluate the content and meaningfulness of the proposed survey items to establish the face validity. These experts did not indicate any difficulty understanding the items or scales, but minor rewording was done to ensure ease of flow as per the government culture. Then the survey

was further piloted with five responses received from 10 randomly selected top management staff from the same background as those chosen to participate in this stage. The pilot survey supported the understanding of areas needed to be reworded or deleted within the estimated time required to answer, i.e. 20-25 minutes, while ensuring that the respondents are competent to answer the questions rose. The survey was carefully revised again based on the feedback given by these participants, and the data collection plan adjusted to have coordinators in each government organisation. A schedule for administering the questionnaire and transforming to codes was finalised, followed by analysis of data and interpretation of findings, including considering implications of findings in the research questions. The purpose and relevance of the study were explained to the participants in a separate cover letter that was sent with each e-mail from the coordinators GO entity (Jankowicz, 1995). Appendix (3) carries a sample of invitation letter.

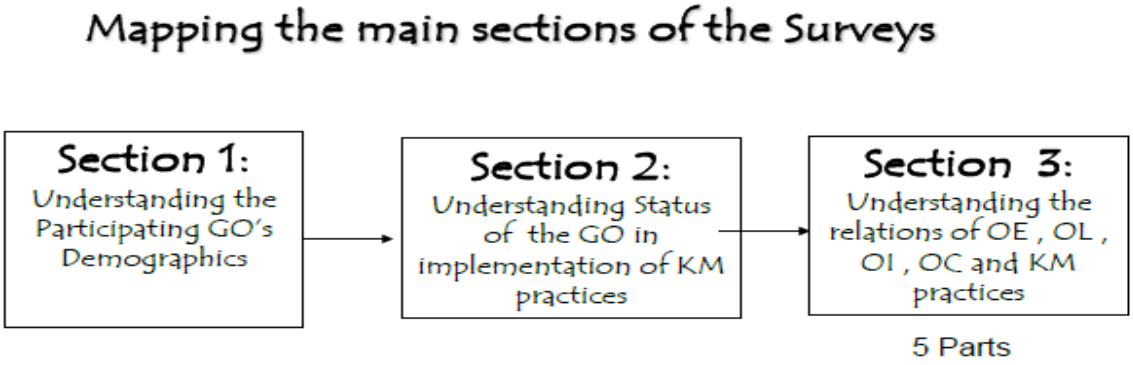
The survey was named KM-OC survey, reflecting that relations measured are meant to address the path from KM to OC, i.e. going through the relations with any of the other three organisational development practices (OE, OL and OI). The cover pages developed (before the start of the main questions) were divided into the purpose, introductory notes and the questionnaire-specific goals. Then the questionnaire started with

PART 1: Demographics; *followed by*
PART 2: Organisation Development Status, Information; *and finally*
PART 3: Measuring the five variables (KM and OC with the three organisational development practices OE, OL and OI).

To avoid survey bias, the questioning avoided direct measurement of the strength of the proposed relationships. Detailed explanation on the purpose of scale development and the questionnaire's main sections are discussed in sections 5.3 through 5.5. Care was taken not to advocate any position (loading) and statements containing a combination of questions (Jankowicz, 1995). The questionnaire included 50 indicators to examine this study's theoretical model; each indicator could be correlated with the latent construct. For example,

the indicator *Our organisation has improved its ability to identify new services opportunities* (q11) is correlated with the latent construct (Organisational Competitiveness) but not necessarily with other indicators in their dimension. More than 54 GO's were invited to participate through their top and middle management at the beginning of the KM-OC survey. A conclusive research design to test the specific *hypotheses* and examine relationships between KM and organisational development practices were conducted based on the first two stages. Figure (5-1) shows the design of the survey three sections where each target to complement each other in addressing the proper measurement of KM influence.

Figure (5-1) Three sections of the survey



5.3 Reviewing the Pre-existing Questionnaires

Initially the researcher reviewed the existing literature published instruments used in KM or in relevance to any of the four organisational development variables' previous research; i.e. Organisational Excellence, Learning, Innovation and Competitiveness. Some of these instruments are well established in the practitioner world and considered a main reference for different countries, for example the APQC KM Assessment Tool (KMAT), OECD KM Survey and the World Bank KM Index (KMi) mentioned in Chapter Two. Although these tools are practical, none could address the research needs that focus on the KM influence as part of a set of measures, rather than as stand-alone instrument. In addition, all peer-reviewed governmental organisations related published work was similarly reviewed. The process of evaluating pre-existing questionnaires included their purpose, scales

development, conceptual base, potential subjects, data-gathering method, content, administration, scoring and understanding the reliability and validity issues. As mentioned earlier the literature of reference surveys were examined at the beginning of the questionnaires review process in order to determine if they would provide an appropriate measure of the objectives for this study. The following are the main instruments of reference used to develop the survey design and scales.

5.3.1 The first instrument considered (Boumarafi and Jabnoun, 2008)

The first questionnaire considered in developing the questionnaire was by (Boumarafi and Jabnoun, 2008) which *was used to set the research psychometrics in general.* The work of Boumarafi and Jabnoun (2008) focused on investigating the KM relationships with the organisational performance in the United Arab Emirates (UAE). The researchers of this reference used specific constructs related to organisational culture, organisational infrastructure, technical infrastructure, management support, rewards and vision clarity which was not directly applicable to the scope of this study. The scales of this instrument were found to be marginally useful for KM and OE scales, since indicators relative to efficiency, customer satisfaction, decision-making, quality of work and financial benefits were attempted.

5.3.2 The Second instrument considered (Ikhsan and Rowland, 2004)

The second instrument examined was based on the Malaysian government sector study executed by Ikhsan and Rowland (2004) that *developed scales on knowledge asset and knowledge sharing.* The scales targeted to examine the availability of KM strategy in a developing country and its influence on the benefits, the problems, the responsibilities and technological aspects. Some of the KM indicators relevant to KM policies used by the researcher were based on Ikhsan and Rowland (2004), but with certain scale modifications.

5.3.3 The third instrument considered (Al-Alawi et al., 2007)

This third instrument considered as a reference for the survey development, due to it being designed to *assess knowledge sharing relevant to specific cultural factors such as communication, trust, reward and information systems.* Since this study does not target measuring specifically cultural issues as discussed in Chapter Two, and since the survey has not been used in governmental sector the survey scales were of limited use. However, the questionnaire setup helped realise the type of face validity expected in similar country where the context of study was executed.

5.3.4 The fourth instrument considered (Chiva et al. 2007)

The fourth instrument used as reference was the work of Chiva et al. (2007), *which mainly focused on capturing the organisational capability to learn*, however without enough emphasis on OL practices. Some of the scales reference to OL such as teamwork and collaboration were extracted from this instrument and is used in this study KM-OC survey.

5.3.5 The fifth instrument considered (Rhodes et al., 2008)

The last instrument of main reference was the work of Rhodes et al. (2008) *mainly focused on the knowledge transfer scale that lead to organisational innovation.* The scale starts from factors that influence the rate of knowledge transfer factors such as IT systems, structured learning strategies, innovative organisational culture, and flexible structure and design. The researcher benefited from the knowledge transfer, the innovative capabilities and organisational performance scales with some modifications.

5.3.6 Critique of existing instruments

Mentioned in literature review and previous sections in 5.3, there were *no previous studies exploring the holistic practices of all five prevalent organisation development practices* (KM, OE, OL, OI and OC). Furthermore, there were no appropriate set of indicators that the researcher came across while measuring the organisational KM, than excellence, learning, innovation and competitiveness practices found to be most suitable for the

government sector and/or service industry. Besides, the five main reference instruments, the researcher benefited from different literature for each specific type of organisation development practice. Specifically the KM scale indicators extracted from Syed-Ikhsan and Rowland (2004), while OE scale was extracted mainly from Santos-Vijande and Alvarez-Gonzalez (2007). Some of the OL scales were extracted from Chiva et al. (2007), while Chuang et al. (2010) was a reference for OI scale and Kim and Vendenabeele (2010) was a reference for OC scale.

Based on this, the researcher decided that it is most suitable to go for the development of a novel holistic approach instrument that is coherent in its wording, yet clearly identify the difference of the concepts measured. The comprehensive scale addresses all needs for a holistic integrative framework that would examine the relations of KM and OC with the other three main constructs, OE, OL and OI in a single survey. However, the researcher had utilised the existing questionnaires scales and design to inform the design of the research instrument to suit the nature of this study. The scales need to be carefully tested to address all dimensions in the context of government organisations (Devellis, 1991).

In summary, the researcher chose to develop certain scales informed by some of the published scales discussed in Chapter Two and sections 5.3.1 to 5.3.5. Due to the particularity of having five variables that are studied at one time, the indicators had to be precise, specifically to the point, and fit to local understanding with in a suitable language for GO's environment.

5.4 Establishing the Questionnaire Scales

Reference to previous chapters, the central questions of interest is about the phenomena of KM influence where the researcher try to understand what happens to the relationships between the organisational development variables due to this holistic influence by KM and whether it would lead towards organisational competitiveness. Moreover, the researcher attempts to address how KM influences each of the variables, hence researcher efforts and review of scale development target to address specific needs of the *research questions*

(Devellis, 1991). The researcher focused on selecting scales that consider the proper understanding of key organisational factors as in culture; training, processes, leadership, human capital policies and networks. These factors are found to influence KM scale thus influence teamwork, decision-making, improved efficiency, productivity, improved products or services, responsiveness to customers, innovation or creativity and quick response. Yet, the set scales need to be context oriented (Rhodes, 2008; De Souza, 2006; Wong, 2005; Marr et al., 2004).

In relevance to Stage Three of the research design referenced in Chapter Four; it has been show in the literature that different rating scales for the five organisational development variables (KM, OE, OL, OI and OC) have been proposed separately. The challenge was in selecting the scales that address the critical methodological issues of validity and reliability in the holistic approach to the relations between the different organisational development practices specified (Babbie, 1998). To confidently identify a relationship between changes in scale results and the reliability of the scales, a scale development procedure was followed by the researcher where the scales were first proposed based on the reviewed literature.

The precise definitions established in Chapter Two were used as a guide for the scales selection, modification, rejection and development. The scales were designed to help measure the 'perception' of the subjects on the duration of time taken to get knowledge-related material (De Vaus, 2002). For example, there were some combinations discussed in Chapter Two about KM practices, however what is targeted to be measured in this research project was not capabilities or practices, rather it was the practices relevant to KM that lead to KM influence. Hence, available scales were not suitable since these scales goes into deeper details of influence on each KM practice. While in this research a holistic approach would need to address the different organisational developments variables influenced by KM practices on (i.e. OE, OL, OI, OC, besides KM) through understanding the relations between their indicators. Hence, the adoption or modification of an existing scale was done to meet the objectives of the current research.

Scales were developed as per the literature review, with either minor or major adjustments based on the suitability of such scales to the measured indicators and the fitness of conceptual framework where the linkages of the five dimensions were being looked at again from the holistic point on how all of them or any of them could lead to organisational competitiveness (Devellis, 1991). The wording of the questions was carefully chosen for simplicity thus making possible direct answers without deep thinking (as a reflection of perception). Many researchers who have tackled this area avoided going into great detail (Rhodes et al., 2008; Willem and Buelens, 2007; Migdadi, 2005). A smooth flow of questions and their inter-relation in each dimension was carefully tested. The smoothness and ease of understanding for having questions in English, being a second language in the country of study, were also checked by government experts and found to be understandable. Reliability of scales used in the survey questionnaire would be checked for internal consistency among the scales. The pilot study used helped checking the reliability of various scales included in the survey.

In order to build the questionnaire towards the *research objectives,* the researcher considered only close ended questions for suitability. The survey targeted finding out the respondent's attitudes towards the perceived KM influence on creating organisational competitiveness either directly or through the prevalent organisational development practices identified in literature, in the context of GO's. The researcher wanted precise descriptions of variables to ascertain the respondent's perceptions; thus closed ended questions were mainly chosen to be the norm for the entire survey. The Likert scale was chosen to obtain equal attitude value on the construct or question on the scale. It should help identify concerns of the participating management team when studying the influence of KM. The decision on categorical over numerical scales was made due to the capacity of the population to measure the intensity of the attitude within five Likert scales which best described their opinion. The five point Likert scale has been usually used in similar type of studies and literature to help place the different participants in relation to each other, in terms of the intensity of their attitude towards an issue or a concept, hence this scale shows the strength of one participant's view in relation to that of another in relevance to seeing each of the five concepts studied in the survey.

5.5 Description of the research Instrument

The survey instrument for this study consisted of an e-copy of the cover letter to the coordinators, an instruction sheet and the questionnaire. The instrument was designed to be completed using an electronically 'ticked' self-survey file. The main concepts questions in section Three were organised into five main parts representing indicators to measure the five organisational development practices in the GO's context; that is OC, KM, OE, OL and OI consequently. Most of the constructs scales in the early stages of the development were approximately 8 to 12 hence some were summarized to bring the targeted number of ten questions without compromising on the quality. Since the five concepts, i.e. KM, OE, OL, OI and OC are related, some indicators were repeated or looked very similar thus had to release some or move others based on the seven experts feedback before the pilot survey; thus certain construct are kept away to avoid reported confusion. Hence, each part of section Three became contained dimension with ten closed-ended questions to give a fair presentation for each variable to be measured thus gives equally distributed weights, while maintaining an acceptable questionnaire design. While the first and second sections measured both the demographic and organisational status going to be discussed below. Each of the five parts in the third section of the main survey was fulfilling the *research aim on* ***investigating the influence of KM on three prevalent organisational development practices in a government setting and the influence on organisational competitiveness.*** Appendix (4) contains the complete main (KM-OC) Survey. This made the total survey questions and time needed to fill the survey feasible with approximately 70 questions to answer from three different sections. The questions design development granted weight to address the need of getting appropriate number of respondents that are most likely to respond if the perceived benefits of doing so will out-weigh the perceived costs of responding (Dillman, 2000). Therefore, the balance of ten questions in Section Three helps proper testing of the survey validity and reliability.

As shown in Appendix (4), the first part of Section Three in the survey targeted measuring ***Organisational Competitiveness (OC)*** as part of the *second and third research objective*.

OC as a variable was measured by testing GO's ability to *identify new services opportunities, ability to adopt quickly to unanticipated changes, ability to create a good profitable income for GO's and ability to react to customer demands.* The competitiveness of the organisation was also measured by its *ability to streamline the processes, ability to ensure sustainability of services, ability to form analytical capabilities that lead to learning from mistakes and ability to adopt unique way in dealing with customers in intimacy.* The study used scales as *the ability to establish unique values with its employees that are difficult to copy and ability to have established high quality services or products with low cost and high speed of delivery* to again cover the ***OC*** scales.

The second part was about ***KM*** variable, specifically to *measure whether the GO's top management appreciates the market value of human capital, have clear KM strategies and implement KM policies to improve service delivery.* As part of ***KM*** scales, *acquiring knowledge while modifying its behaviours accordingly, listing all Knowledge Assets inventory and building up ability to capture knowledge* was also targeted. ***KM*** scales also covered whether *the organisation has a link between decision making process and knowledge transfer, share knowledge with its partners, manage knowledge assets to generate new ideas and hold clear process of capturing through collective expertise.*

The third part in Section Three focused towards measuring ***Organisational Excellence (OE)*** testing GO's current practices relevant to *having leaders that provide all necessary resources, presence of established plans to facilitate the adaptation to change, continuous reviewing the organisation progress towards achieving strategic objectives.* Similarly, the researcher art of the ***OE indicators*** measured practices as: *whether the organisation ensures that its employees know their responsibility towards the customers and organisation's objectives, having long-term organisational relationships with partners that help resolve quality-related problems and having practices of continuously improve the operations towards meeting best service delivery at best quality and best cost.* Moreover, part of ***OE*** was testing whether GO's *have effective communication between all levels of management.* Thus, ***OE*** helped support the GO's *work on values and that leads to collaborate with other organizations.* This part was complemented *measuring compliance*

to customer needs in government through processes designed to deliver the right skills and capacities which helps to maintain and improve the organisation performance.

In order to measure ***Organisational Learning (OL)*** variable the scales targeted GO's practices as to *make employees feel free to speak their minds about what they have learned*. Similarly, part of ***OL*** scales focused on the *ability of GO's to turn mistakes into constructive learning experiences where it can encourage and cultivates multiple viewpoints of open productive debates.* ***OL*** scales tried to measure whether the organisation has the *ability to break old patterns in order to experiment different ways of managing daily work, conducts lessons learned sessions, recognize and reward for paradigm breaking solutions to problems, considers learning as an investment than an expense, have interaction sessions that enhances sharing of experiences while setting proper programs that would close skill gaps and enhance proficiency and manages to involve personnel in important decisions.*

The last scale developed to measure ***Organisational Innovation (OI)*** variable through rating GO's with *clear social networks that support innovative capabilities, with reward scheme based on the value of innovation, with business results that focus on customers and understand the changing demands and has an established mechanisms that harness the innovativeness of key individuals and teams to create value*. Moreover, the ***OI*** was measured through indicators that *measure the ability to combine knowledge with results to build new products and/or services, practices that bring new products and/or services on a yearly basis, and the ability to transfer best practices leading to new developments.* The measure for *organisation facilities that enhance team-work, its ability to speed up creative ideas and ability to develop new ideas from capturing achievements and failures* was also measured to see how GO's perform in relevance to organisational innovation. Sections 5.5.1 and 5.5.3 briefly detailed the contents of each of the survey's three main sections.

5.5.1 Demographics

This section in the survey helps describe the sample and address differences between and within groups. The personal information of the participants was limited to the gender type, age and position. The age was defined to be in the ranges of less than 25, between 25-34, between 35-45, between 46-50 and above 50; while the positions were specified to be *undersecretary, manager or director, department head and specialist.* The demographics section addresses partially the *second and third objectives* by understanding the different group responses, in the context of study. Thus the researcher could check on the groups' type as per *(age, gender, management level, type of organisation)* and how they may affect the type of data collected in all sections and specifically the third section.

5.5.2 KM organisation status

Reference to the experience and importance of understanding the organisation status as per the *status screening survey*; the researcher designed a section (called second section) of the ***KM-OC survey*** containing a list of questions that targeted building an understanding of the general organisational knowledge management status. This section was meant to support the evaluation of the finding from Section Three and check on any contradictions in the answers, while observing the level of or likelihood uniformity within the GO's culture, as perceived by the participants. In this second section the organisation status is measured through exploring the type of services delivered, the rate of influence of KM practices and how knowledge is considered a main asset. The second section correspondingly covered the challenges facing the proper implementation of KM, the rate and length of time needed to get knowledge related material and type of organisational culture. Understanding the status of the KM implementation and type of practices would help in the later analysis the level of KM influence available compared to the results with each of the organisational development practices specified. Thus the understanding of this section would help address and analyse KM holistic influence with reference to the organisational status which helps addressing both the *research second and third objectives.*

5.5.3 KM relations with Organisation Development Practices

The third section comes as a result of the *first objective* and tries to address the *second and third objectives.* The five dimensional parts which includes KM and the other four prevalent organisational development practices (OE, OL, OI and OC) sets were developed to measure the perception of the GO's top and middle management. KM influence in the third section represents the five concepts discussed in Chapter Two and part of the three objectives of this research. The five variables were reflected in a total of 50 questionnaire items with five Likert scale, the participants were expected to choose the most appropriate statement that applies to their organizations at the time of survey using the electronically ticked form mentioned earlier.

5.6 Ethical Considerations

Oppenheim (1992) sees that all research that involves investigation of human subjects should consider ethical issues as a moral imperative. To conduct research with the highest ethical standards possible and should always consider the physical, psychological and the social impact on the participants. A collective assessment of the methods approached has been viewed from an ethical perspective based on the risk-benefit ratio starting from the time of the data development to the collection procedures. In the present study, the researcher got the ***approval of the Prime Minister Court*** being the main authority representing the whole context of government organizations in the study area of Kingdom of Bahrain. An ethical form was signed and stamped by the senior advisor of the Prime Minister's Court granting the approval for permission for the study, attached in Appendix (2) the Consent Approval for granting access to all government organizations in the study results analysis. A copy of the research proposal was provided to the Prime Minister's Court including: The definition of the problem with a brief review of the literature and the intended methodology including a concise description of the data collection plan stating how would the study be done, who would be involved, what is expected from the participants, when would the study be completed and concluded with a summary of ethical considerations decisions. The ethical considerations decisions included a relevant statement

of the ways of assuring protection of government data. Appendix (2b) shows the *ethics approval statements* and forms.

5.7 Questionnaire Review, Piloting and Modifications

Following the proposed questionnaire design was necessary for the uniform understanding and the presence of accurate and clear questions suitable for the context and area of study. The researcher tried to overcome the challenge of a self-developed questionnaire as possible by reviewing questions variation, redundancy in meaning, scalability, possibility of getting non-response and/or just accepting the level of response (De Vaus, 2002). The experts pre-pilot review of the questionnaire and piloting the survey as per steps (Q2) and (Q3) of Table (4-2) discussed in Chapter Four helped enhance the performance of ***KM-OC survey***. Three aspects relevant to building a good questionnaire were followed strictly, the relevance check of the questionnaire ensured obtaining the information it was designed to seek, while the completeness check examined if all desired relevant information could be obtained through this questionnaire. Finally an accuracy check was done so that the responses to the questions could be placed relevant to the *research questions* and compared to the *three study objectives* (Creswell, 2003).

To enhance the questionnaire validity, the researcher decided to further take a step and seek feedback from seven external reviewers as an expert panel. Here external review experts were chosen from GO's and academics with theoretical questionnaire knowledge along with practical experience, who were requested to review the initial draft questionnaire with a critical lens and identify potential questionnaire problems, then the questionnaire was developed further (Dillman, 2000), The research supervisor played an important role assisting in refining the questions more and more.

A *pilot test* was then performed for the survey randomly inviting ten top management leaders to participate in the survey. Only five of the ten invited were able to reply and participate in questionnaire development feedback fully, but nevertheless the ten feedbacks helped to further establish the survey reliability. The questionnaire was pre-tested using a

sample from top and upper middle managers in different GOs from within the ***Government of Bahrain***. The test was administered in the presence of the researcher with the objective of assessing any challenges facing the participants during completing the information sought. Through pilot survey, estimate of acceptable maximum standard deviation and the sample size of the main study could be determined; hence the pre-testing helped improve the questionnaire for its intended purpose meeting the *research objectives* (De Vaus, 2002). The estimate is drawn from the random sample of defined population. Determining sample size is a very important issue because samples that are too large may waste time, resources and money, while samples that are too small may lead to inaccurate results. Thus, the piloting exercise support the validity of the questionnaire thus measuring what is aimed to be measured and it is an early warning whether the survey is deviating and measuring anything else. It implies that empirical evidence generated by the measure is consistent or not with the theoretical logic about the concept. The survey piloting resulted in improving the wording and changing some of the questions and eliminating others. All survey categories have been assigned numerical values as a result of the feedback from the participants. This raises the possibility of generalisation of the survey setup based on the results.

5.8 Direction provided to the Survey Coordinators and data collection

The researcher decided to distant himself away from the data collection process to avoid any influence of the survey bias. In reference to step *Step (Q4)* as shown in Table (4-2) of the data collection plan, 60 survey coordinators were called to be trained on the data collection process with emphasis to keep the researcher name and address only for their reference or questions related support. The survey was collected through specific coordinators from all 54 participating government organisations, where guidance notes were handed out to each *Organisation Survey Coordinators*. Appendix (3) presents the Survey Invitation Letter and the guidance note given to the survey coordinators. The *guidance notes* included the purpose of the survey and its objective and type of questions expected to be raised during the distribution of the survey and the time expected to complete the survey was specified from 20-30 minutes. The motivation of this research as

explained to the *survey coordinators* is to help decision makers in the GO's of the government of Bahrain to understand and benchmark KM influence in the governmental sector that can be the basis for future studies. The confidentiality of the survey response includes the anonymity of those filling the questionnaire was assured. The researcher extended his sincere appreciation and asked to be contacted through the coordinators only in the specified contact numbers for any further clarifications. The coordinators where given a role to follow up and encourage the decision makers from top and middle management to participate in this survey since it would help to establish a national pace of the government practices in the knowledge economy and help see how its future initiatives ensure better competence.

5.7 Sampling and Data Collection

According to Neuman (2003) sampling is a process of systematically selecting cases for inclusion in a research project, it is *a technique that involves taking part of the population to represent the whole population in such a way as to permit generalization about the phenomena of interest.* Sampling should help organise results while keeping economies of cost, time and personnel in mind (Zikmund, 2003). In modern sampling theory, a basic distinction is made between probability and non-probability sampling; this procedure should help the generalisation of the research findings (De Vaus, 2002).

This research was conducted to understand how top and upper middle management personnel perceived their GO's status and practices to certain organisational development concepts; including KM. As this research requires assessment of the opinions of people with a relatively high level of knowledge and expertise in knowledge management practice, top and middle management was specified as the targeted population. Studies reported that expert opinions are likely to be more credible for an audience (Babbie, 1998). Since the number of top and middle manager in the ***Government of Bahrain- Civil Service*** is approximately 800 decision maker, therefore due to this limited size, the researcher targeted all the GO's decision makers' population. When the permission was obtained, the data collection processes took place. The concepts relevant to the problem under research

need to be defined before initiating the data collection procedure. The process of taking a construct and refining it by conceptual definition needs to be supported by clear practical definition that links the theory to the empirical measures (Zikmund, 2003).

Total number of Civil Servants Employees in Bahrain Government varies between 37000 to 40000 in the last few years. More than 60% of them work in the area of Education and Healthcare (Life Necessity services).Government Organisations in total employ about 6% of the total work force in the Kingdom of Bahrain. There are more 30 main government organisations and where there are more than 60 sectors reflecting all the type of governmental and semi-governmental main processes of service delivery.

The average employment requirement is usually not less than 20 years; however the minimum is only 17 years old, however for this decision making population level it is not expected to be less than 24 years old. Women counts for up to 40-45% of the total work force. Total working man-hours for the government is only 1872 hours. Retirement age is still at 60 years old, however government encourages early retirement as young as 55 years old or even less. The strategy of the Bahrain Government in relevance to Civil Service Government Organisations started to sharpen more in the last few years even through there is a high maturity in the practices and systems with this country compared to other GCC countries as many departments and ministries have been in existence more than 50 years.

This government similar to other emerging developing countries in the world have been putting many practical initiatives that are targeting gradually to reduce the size of the governmental organisations, enhance its efficiency, streamlining the government processes, decentralising most of the main governmental processes while improving its competitiveness. *e-Government, Labour market restructuring, Labour fund and Government Excellence Program are just few examples of the recent initiatives.* However, all the government initiatives are integrated and does not help to produce the outcome effect awaited from all of them. Hence, now Bahrain similar to other GCC countries focus shifting the governmental focus on efficiency and effectiveness improvement initiatives where sharing of best practices initiatives are spreading through different leading programs

as governmental excellence program and knowledge management programs, reflected in the country's vision program and driven the top government officials. Bahrain Vision 2030 produced by its Economic development Board (EDB) is one of the drivers for many recent government initiatives in relevance to delivering organisational development practices targeted in the scope of this study (EDB, 2007).

The *response rate* obtained from the survey, as shown in table (5-1) was *78%* which is considered a very good response. Out 640 filled survey received electronically through the coordinators from each of the 54 participating organizations 625 accepted. Chapter Six would present the results of this survey analysis where specific practices of KM practices would correlated with the four development organisational practices, including OC. Table (5-1) shows number of participants from each of the GO's in the government of Bahrain.

Table (5-1) Presentation of the number of completed surveys from each government organisation participated

Participating Organizations	Received Surveys	Participating Organisations	Received Surveys
1-Prime Minister Court	2	21-The Bahrain Stock Exchange	10
2-Bahrain Stock Exchange	13	22-Bahrain Center for Studies and Research	7
3-Central Information and Statistics	11	23-Social Insurance Authority	12
4-Ministry of Social Development	16	24-Labor Market Regulatory Authority	11
5-The Ministry of Culture	6	25-Ministry of Islamic Affairs	12
6-Ministry of the Interior	No feedback	26-Labor Fund	No feedback
7-Ministry of Education	5	27-Ports Authority	6
8-University of Bahrain	15	28-E-Government	No feedback
9-Ministry of Foreign Affairs	30	30-Bahrain Development Bank	42
10-Ministry of State for Shura and House of Representatives	7	31-Tender Board	No feedback
11-Ministry of Justice	No feedback	32-Constitutional Court	No feedback
12-Ministry of Industry and Commerce	36	33-Financial control	No feedback
13-Ministry of Labor	38	34-Attorney General	No feedback
14-Ministry of Works	48	34-Provinces -Ministry of Interior	2
15-Ministry of Health	120	35-Ministry of Transportation	41
16-Survey and Land Registration	1	36-Public Authority for Electricity and Water	5
17-The General Authority for Protection of Marine Resources	No feedback	37-Ministry of Housing	No feedback
18-Civil Aviation Affairs	No feedback	38-Ministry of the Interior	10
19-Central Bank of Bahrain	16	39-Ministry of Municipalities Affairs	12
20-Authority of Legal Affairs	No feedback	40-General Administration of Customs	No feedback
41-Civil Service Bureau	2	47-Gulf Air	5
42-Ministry of Finance	3	48-Ministry Information	12
43-General Organisation for Youth and Sports	9	49-Oil and Gas Authority	23
44-8-Internet Exchange	No feedback	50- Ministry of Municipalities	34
45-Ministry of Defence	No feedback	51-Traffic Authority	5
46-Office of Financial Supervision	No feedback	52-Transport Regulatory Athority	2
		53-Visa and Passport Regulatory	2
		54-Television and Radio	7
Total	**640 received (625 Accepted)**		

5.10 Conclusions

The procedures for setting up the scales of survey instrument shows that most of the indicators used are either retrieved from literature or from adequately peer-reviewed surveys. The *questionnaire design* was developed in this chapter based on reviewing the literature in relevance to the scope of the study. *Sampling* was executed as per the data collection plan. This resulted in a finalised version of the questionnaire which was used to investigate the KM influence in the areas of OE, OL, OI and OC.

The scale development procedure focused on measuring the KM influence specifically with respect to organisational development practices in GO's. *The development of specific scales was necessary due to three principles: (1) the conceptual framework, (2) the unsuitability of previous available scales, and (3) the particularity of government organisations in general.* The process of experts review and piloting the questionnaire was strictly followed to ensure face and content validity.

A careful sampling was done in 54 participating government organisations, where guidance notes given support for each o*rganisation survey coordin*ators assigned to manage to collect the survey feedback mostly electronically filled. Before that ethical considerations guidelines and approval was strictly followed to fit the specific requirements of the government of Bahrain and respect the GO's sensitivity to sure data. As the questionnaire targets to provide objective quantitative information about the topic of study through the best representative population of decision maker in Bahrain Government Organisations, the role of the survey coordinators became more important. The three sections and five parts of section three of the questionnaire explained shows the sequence of thought that support the participants understanding the survey and fill it with minimum obstacles. The *survey coordinators* played a good role for ensuring minimum bias effect on the participants especially in the uniqueness of the context of this research. Chapter Six presents the analysis of the empirical survey and data analysis results interpretation.

Chapter Six – Analysis

6.0 Introduction

The main purpose of this chapter is to examine the relationship and direction of KM influence on the identified organisation development practices (OE, OL, OI and OC) and study these variables in relevance to organisational competitiveness. This should address the research objectives through understanding the relations between each of the variables in a comprehensive way, through established procedures that ensure the validity and reliability as discussed in Chapter Four. Data would be explored as a result of the applied procedure in order to establish any preliminary relationships or patterns between the demographics and the target variables. These relationships are examined through correlation analysis to determine the direction and strength of the association, and this is complemented by Principle Component Analysis (PCA). Regression Analysis and Confirmatory Factor Analysis (CFA) using Structural Equation Modelling (SEM) are used to test whether the measures of the constructs in this study are consistent with the researcher understanding of the nature of that construct (or factor). This will thus ensure contribution of each of the variables towards establishing a better organisational competitiveness in GO's. As such, the objective of the CFA is to test whether the data fit the hypothesised measurement model.

Descriptive data analysis is presented with respect to the KM practices influence on the other status practices; this is supported by inferential statistics to investigate the indicators, models and hypotheses. In many cases, the conclusions from inferential statistics extend beyond the immediate data alone; hence the researcher addressed issues associated with the large amounts of data generated, through aligning each indicator with the findings supported by the literature. Trying to infer from the sample data, the researcher investigates what the population thinks and make judgments on the sampling probability from the observed difference between groups. The researcher linked each of the inferential analyses to specific research questions that were raised in Chapter Three and partly in the

introduction chapter. Notes were given on the different runs that were used for testing the relations of the proposed study model.

The researcher tried to present enough detail to follow the central line of the results in all planned analysis stages; where extensive analysis results are presented in the appendices, reserving only the most critical analysis summaries for the body of the thesis itself. The scales administered show high internal reliability and a reasonable indication of validity. The analysis work was done using PASW/SPSS since it is one of the most reliable statistical analysis packages.

6.1 Analysis of the Research Objectives

In order to analyse, review and disuse the analysis of quantitative data, it needs to be taken stages (Dooley, 2000). The stages in this study were synchronised with its three defined objectives and cross checked for its ability to answer the *two research questions.* The following analysis stages were conducted to cover each of the *research objectives:*

1) *Preparatory statistics* was established through Missing Values Analysis (MVA) and various psychometrics approaches and procedures were applied in the study.
2) *Descriptive statistics* was used to describe the main features of the collected data quantitatively and to investigate the specific roles of KM in creating OE, OL, OI and OC.
3) *Inferential statistics* using T-test and One Way ANOVA was used to examine and infer statistical significance for independent samples and the difference between three or more groups, respectively. The inferential test was used to help understand the interactional effects between OE, OL, OI and OC of KM.
4) *Pearson's r statistical* index was used to describe the degree of strength and the direction of relationship to understand or confirm on which aspects of KM are most influential in turn to OE, OL, OI and OC when OE, OL, OI and OC are considered together.
5) *Multiple Regression Analysis, Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM)* were used for testing and estimating causal relations

using a combination of statistical data. This was supported with qualitative causal assumptions to help understand how KM contributes to a holistic approach of organisational development practices that comprises OE, OL, OI and OC.

6.2 Preparatory stage - Cleaning and organizing the data

The data collected was checked before, during and after logging for the study integrity and reliability of results, hence the data accuracy was double checked for proper data entry. Appendix (5) presents the details of *missing value analysis* tables.

To avoid distortion of the final results, missing data imputation was conducted. Table (6-1) clearly speaks out figures missed relevant to the position where the missing values was up to 4 % for N=625. This might be due to the majority of the participants being Department Heads and Directors where sensitivity of data depends on to their organisation level of transparency. The interpretation for this is that many participants might have left these data entries empty fearing to unleash their identity through the filled data, however since most of missing values are below 5%, it was acceptable. There were also up to 2.2% missing values, when participants were asked about whether their *organisation had a clear process of capturing collective expertise and intelligence.* This might be explained again that participants might have not experienced their government organisation capturing knowledge where GO's are reputed to lose such drain especially in developing countries. Even though the highest missing value of the OE variable was low i.e. (1.6%), this was justifiable since the participants might not be aware of their organisations defining partners, let alone *build long-term relationships with its partners to resolve problems.*

It is noted as per Table (6-1) that most missing data is in the last part that focused on organisational innovation (OI), maybe due to using new terms to the government services. 3% and above had missed to fill their answer relevant to whether their *organisations have all the facilities that enhance team work*, this can be referred due to the challenges in addressing the type of facilities meant, especially with the expected low experience in the

principle of team work in the government culture, which may have made the question difficult to answer.

Table (6-1) **Category of missing values per measured variable, N=625**

Category	Missing	
	Count	Percent
OC	0	0
KM	2	0.3
OE	2	0.3
OL	3	0.5
OI	10	1.6

As in Table (6-1) overall the missing values are negligible, even the 1.6% missing data on OI, which is justified by the need for government organizations to do more improvements in the area of organisational innovation (Lee et al., 2011).

6.3 Reliability and Validity Analysis

Measures adopted and statistical analyses of overall Cronbach alpha and cross-correlation were done as part of addressing the reliability and validity within acceptable criteria for the entire five dimensions (OC, KM, OE, OL and OI). Since the questionnaire follows a holistic approach, the overall Cronbatch for each dimension is important since all the questionnaire constructs eternally is consistent, hence the Cronbatch test should help check the consistency of the internal constructs and whether they are related with each other.

6.3.1 Reliability analysis

The Cronbach alpha procedure was calculated for each part in section Three of the main survey to explore the holistic link as per the *third research objective.* The procedure helps correlate the independent variables to the dependent variables based on different nominal scale (Neuman, 2003). Cronbach alpha coefficients were used to assess the reliability of the rating scale though summarising a group of tests or survey answers which measure some underlying factor. Cronbach alphas were computed based on the correlation coefficients

among the variables compromising the test. Table (6-3) shows that the lowest Cronbach alphas is 0.867 for *the organisational competitiveness*, which is expected as it is the stage where organisations can sustain competitiveness and where other organisational development variables have been implemented or practiced for some time. The *organisational learning* shows the highest Cronbach alphas of 0.929 which means it is even more reliable than KM which was 0.921. Appendices (8) and (9) present details of Cronbach Alpha's for all the prevalent organisation development variables (KM, OE, OL, OI, OC) reflected in Table (6-2).

All items found to match each of the 50 scales of section Three were found to be considerably well above the criterion of 0.60 and could therefore be classified as reliable (Neuman, 2003), the high internal consistency reliability is attributed to the high homogeneity and similarity of the 50 questions (called indicators), in defining the 5 main dimensional organisational development practices. The high consistency in responses can be considered as part of the research challenges later in Chapters Seven and Eight; however the government organisations context might be one of the reasons, from the point of view of the similarity in demographic profiles that explains the sample homogeneity. In table (6-2) overall alpha coefficient was also calculated for the entire questionnaire variables to measure the internal consistency estimate of the general idea of the *five prevalent organisational development practices inter-correlation.* The logic of this step was to get an estimate of about the holistic influence that the KM practices is generating.

Table (6-2) **Reliability coefficients (Cronbach Alpha) for the organisational development practices.**

Item	Cronbach alpha
OC	0.867
KM	0.921
OE	0.913
OL	0.929
OI	0.905
Overall alpha	0.975

6.3.2 Validity analysis

Validity analysis was carried to measure the survey effectiveness in measuring what is supposed to be measure according to the *research aim and objectives.* Therefore, the researcher sought to ensure that results accurately reflect the concept being measured through considering the validity in terms of 'content' or 'face validity' and moreover in terms of 'construct validity' during the examination of the psychometric properties, which was simply a demonstration that the items tested in the survey are clearly drawn from the domains being studied.

In order to address this issue the research verified content validity or face validity of the scales through a review by seven experts, four of whom work as top management in the government. Construct validity, on the other hand, was investigated using a correlation procedure used to evaluate the questionnaire items. The purpose of the procedure was to gauge the validation of index operationalisation in measuring an underlying concept. Specifically, each of the 50 indicators in the questionnaire was correlated with all the other indicators. This analysis indicated significantly bivariate relationships in the anticipated direction pointing to construct validity.

The discriminant validity procedure was done to assess whether the correlation between the constructs whether it differs significantly from 1 or when the Chi-square difference test indices shows that the two constructs are perfectly correlated (De Vaus, 2002). The test focused on whether the change in Chi-square ($\chi 2$) value between the restrictive model and the accepted model is significant. All tested validity types (face, content, construct and discriminant) show that the survey instrument is strongly valid.

6.4 Descriptive Statistics

Descriptive statistics were used to describe the basic features of the data in the study, to provide simple summaries about the sample and the instrument measures. The researcher distinguished the descriptive statistics from the inferential statistics since the latter is used to reach to conclusions that extend beyond the immediate data alone based on the inference

about what the population might be thinking; while the use of descriptive statistics is simply to describe what's going on in the research data in terms of percentages, frequencies and distribution. Univariate analysis techniques were used across the cases of one variable at a time, where there are three major characteristics for each single variable intended to be looked at: the distribution, the central tendency, and the dispersion characteristics.

The researcher combined several variables to define the study demographic profile and to generate enough information about the typical organizations, the participants' age, position and how they perceive the organisational development practices in their GO (table 6-3). The analysis and tables reflect how each particular group of participants perceive the influence of KM on the specific organisational development practices.

Table (6-3) **Demographic table for participants**

Category	Sub-Category	Frequency (N)	Percent (%)
Sex	Male	350	56
	Female	266	43
Age	Less than 25	3	.5
	Between 25-34	177	28.3
	35-45	163	26.1
	46-50	139	22.2
	50+	134	21.4
Position	US	17	2.7
	Manager/Director	140	22.4
	Department Head	203	32.5
	Specialist	121	19.4
	Others	117	18.7

Review of Table (6-3) shows that up to 78% of the participants are below 50 years old, which represents that government management positions have similarity with Bahrain population statistics where the majority are young. From the analysis of organisations demographics most respondents were middle aged managers between the age of 25-34 years 33.9% and of the age of 46-50 (31.4%), which reflect top and middle management available in the GOs within the targeted population of Bahrain Civil Service. There was a fair split of gender where the respondents' males were 65.1% against 41.5% of females. With regard to position, 10% were from the top management of the GO's, while the rest

were from the upper middle management 29.7% and middle management 28.8%. These numbers fairly reflect the actual situation in the Government of Bahrain where by groups of sub samples are fairly distributed equally.

The rich data of 625 participant questionnaires showed interesting interpretation where the highest organisational development practices was within either the age group of < 25 years old or those above 50 years old, with focus on organisational excellence being perceived as the most important prevalent practice in GO's as per Table (6-4) which shows the mean of the summated scale score for each construct.

Table (6-4) **Mean of the summated scale score for each construct in relevance to age**

Age Group	OC	KM	OE	OL	OI
Less than 25	3.7333	4.0333	3.9667	4.0667	3.9000
Between 25-34	3.3622	3.1337	3.4323	3.0914	3.1267
35-45	3.5102	3.3166	3.5473	3.2539	3.2918
46-50	3.4782	3.3599	3.5850	3.3537	3.3490
50+	3.6057	3.4654	3.7819	3.5727	3.5579
Total	3.4823	3.3096	3.5759	3.3034	3.3187

6.4.1 The Organisational Development Status

The second section of the survey focuses on understanding the role of the KM practices and the actual level of organisational development practices in the context of study which address the research *second and third objectives* through a holistic influence.

The results of this section start with showing the highest participants from GO's that work in *'life necessity services'* defined as organizations working in the area of *(Education – Health- Security)* (up to 31%) as per Table (6-5). This might help future GO's initiatives directional focus and strategies as these organizations show the important majority that any initiative should focus on. This reflects the reality where Health, Education and Security

services are the largest size-wise organizations in the kingdom of Bahrain, due to their impact on the service delivery.

Table (6-5) **Type of participating government organisations speciality**

Category	Sub-Category	Frequency (N)	Percent (%)
What type of Services your Government Organisation (GO) delivers?	Life necessity services (Education –Health- Security)	199	31.8
	Innovative and Government Services Development	78	12.5
	Infrastructure related services	120	19.2
	Government Rights Protection Services	49	7.8
	Others	161	25.8

Most organisations as per Table (6-6) admit that they are either in their early stage of KM program implementation (up to 39 %), or have just reached the middle stage of KM program maturity (up to 32%).

Table (6-6) **Level of KM practices implementation maturity in the participating organisations**

Maturity of KM Practices Implementation	% (N=625)
Just starting to realise its importance	15.4
We are in the early of Implementation Stage	23.7
We are in the middle of Implementation Stage	31.8
We are considered mature in implementation	23.8
We are considered in advance matured implementation	4.3
Total	99.0
Missing	1.0
Total	**100.0**

The results in this section show there is a good level of KM experience within the government organisation entities participated in the sample, but there are 15% of the participants show that they are just starting to realise its potential. Furthermore studies in

Table (6-7) show the challenges facing proper implementation of KM in GO's where most respondents (32.6%) had chosen the challenge to be *"Huge information to be managed"*.

Table (6-7) **Knowledge sharing challenges Practices as seen in the governmental organisation**

Type of Challenges	% (N=625)
Scarcity of information shared	22.2
Huge information to be managed	32.6
It is seen as a repetitive work or other slogan	11.5
Loss of lots of tacit knowledge due to high employee turnover	5.3
Weakness of knowledge sharing practices	21.6
Lack of trust	5.3
Total	98.6
Missing	1.4
Total	**100.0**

In order to understand organisational status, *management of information* was examined and it was revealed to be a major challenge for all GO's. The participants showed a belief that it is very difficult to retrieve knowledge related information. While 23% of the participants still *believe that knowledge can be retrieved in hours*, 22.9% believes that *knowledge can only be retrieved after few days.* Some, 18.6% of the participants *believe that it takes few weeks before being able to retrieve knowledge.* However, majority of the participants believe that *knowledge materials need to be retrieved in days and not in hours or minutes* in the GO's. This raises the issue that government organizations still need initiatives that move towards *ensuring the knowledge assets resources (the most important of KM practices) are being able to be retrieved and shared* more frequently.

Direct culture questions were avoided in the third section of the survey, as it was considered beyond the scope of this research. Culture is a big topic which need to be controlled in to deliver the purpose of this research scope, therefore the researcher took the decision to focus on interpreting the culture within the selected five organisational practices dimensions due to their prevalence in literature reviewed as discussed in Chapter Two.

Table (6-8) L**ength of time needed to get knowledge related material for participating organisations**

Length in Time for retrieving knowledge Materials	% (N=625)
in minutes	9.8
in hours	23.2
in few days	41.1
in few weeks	16.0
Other	9.1
Total	99.2
Missing	.8
Total	**100.0**

However, questions relevant to culture development were indirect as per Table (6-9) to observe the status of the government organisations cultures through understanding ways of KM utilization. Knowledge sharing being a main source for KM practices is very important to strengthen the KM influence on the other organisational development practices and thus need to be better established in the context of study. Seeing the overall picture of section Two, there is clearly repeated message that raise doubt about the current KM influence strength with its current status capability in the context of study. For example, the KM status in GO's, as per section Two in the survey shows that the GO's in Bahrain have *weaknesses in knowledge sharing practices, with scarcity of information shared, efforts managing huge information quantities and ability to retrieve information that takes few days.* This gives feedback that as far as the *second research objective* is concerned, the context of GO's might not be ready to create enough influence to meet the proposed holistic influence in the conceptual framework, since issues relevant to *infrastructure, training, trust and/or culture* still affect the influence on KM itself. Similarly, not having such practices might have an effect on the holistic influence explored in the *third objective.*

Table (6-9) reflects the KM utilisation in the GO's as perceived by the top and middle management participants, this is very important for later discussion since it would define the suitability of the model framework proposed along with the reliability and validity of the questionnaire. Majority (37%) of the participants believe that *KM is not well utilised in their organizations* and this would help justify the level of synergy that KM manages to

bring as per the *third objective.* On the other side of the coin, one could conclude that still about 50% of the participants believe they have practices *involving people in decision making, taking care of KM during operation and sharing* that is gradually becoming part of the organisation culture that can help embed the holistic influence of KM.

Table (6-9) **Knowledge Management utilisation as perceived from the participating GO's**

Description of GO's Culture	% (N=625)
Knowledge management is not well utilised	37.4
Our organisation has a culture that is based on total people involvement	16.6
Knowledge management is considered in every operation and process	16.6
Knowledge management is the responsibility of Information Management System Department	11.2
Our organisation values are established based on knowledge sharing	17.3
Total	99.2
Missing	.8
Total	**100.0**

6.4.2 Central Tendency Statistics

An important part of the descriptive analysis is the central tendency analysis; the analysis was done to estimate the centre of values distribution. This study use the mean, as compared to the median and the mode; since the mean is found to be the most commonly used method of describing the estimates of the central tendency in the region. The study identify the dispersion that represent the spread of the values around the central tendency through both the range and the standard deviation of the former shows the result of the highest value minus the lowest value and the set of scores in relation to the mean; respectively.

Most results in Table (6-10) show the central tendency for the mean and standard deviation to be within (3.5 +/- 0.5); which means that most of the participants perceive their

organisation developments and practices to be high. It is worth noting that some representative of certain GO's choose an average range of 4 out of 5, meaning they perceive the concepts and practices to be fulfilled. The results proposes that (37.4%) of the participants believe that KM (*as an internal resource)* is not well utilised. This may be explained that such managers are not used to see area of improvements; hence this needs to be studied further in the discussion chapter. The mean and standard deviation shown in table (6-10) are similar in (KM, OL and OI); while in (OE and OC) were very high.

Table (6-10) **Mean and Standard Deviation for the five organisation development practices**

Organisational Development	Mean		Std. Deviation
	Statistic	Std. Error	Statistic
Org Competitiveness	3.48	0.03	0.63
Knowledge Management	3.31	0.03	0.72
Org Excellence	3.57	0.03	0.66
Org Learning	3.31	0.03	0.78
Org Innovation	3.32	0.03	0.71

6.5 Inferential Statistics stage

As per the data analysis plan the inferential statistics procedure was used to draw inferences about the population from the sample used to estimate a parameter and a confidence interval about the constructed estimate. Inferential statistics was used to detect changes between and within groups; in this research two inferential procedures were used that are the independent samples t-test and the one-way ANOVA. The purpose of this as mentioned in Chapter Four is to allow reporting broader statements about the relationships between the data collected. The independent samples (or two-sample) t-test is used to compare the means of two independent samples. One-way analysis of variance is used to test the difference between the means of the five main subgroups representing government development of variables (multiple testing). The tests were used to distinguish between the inferences related to the dimensions sub-groups and their tendency with the practices of organisational development; this is done at significance of 0.05. Variable normality and homogeneity is an important condition for one-way ANOVA, because like all parametric

procedures, one-way ANOVA assumes 'normality'. The one-way ANOVA was used to determine whether a variable is differentially expressed in any of the conditions tested according to a test variable. For example, how groups differ from each other on KM according to the age test variable.

The t-test in Table (6-11) reveals that an examination of the five prevalent organisational development practices according to gender was not statistically significant at 0.05. Interestingly to report males' portions were slightly higher than females' portions with 350 for men and approximately 250 for women

Table (6-11) **t-test by gender**

	Sex	N	Mean	Std. Deviation	Std. Error Mean	Sig.
Org Competitiveness	Male	350	3.4992	.63905	.03416	0.799
	Female	266	3.4490	.62816	.03852	
Knowledge Management	Male	349	3.2906	.72135	.03861	0.875
	Female	265	3.3203	.71513	.04393	
Org Excellence	Male	349	3.5750	.68696	.03677	0.080
	Female	265	3.5642	.63191	.03882	
Org Learning	Male	349	3.3582	.74569	.03992	0.152
	Female	264	3.2204	.80601	.04961	
Org Innovation	Male	347	3.3128	.71605	.03844	0.704
	Female	260	3.3089	.69902	.04335	

Table (6-12) examine the size of differences between the age groups in the five organisation development practices. Procedure one-way ANOVA was performed on the age data set. The results showed that statistical significant difference was obtained for the five organisational development practices. ANOVA test shows in conclusion that groups do not differ from each other between and within test variable according to age group variances.

Table (6-12) ANOVA differences between Age groups

		Sum of Squares	df	Mean Square	F	Sig.
Org Competitiveness	Between Groups	4.912	4	1.228	3.094	.015
	Within Groups	242.475	611	.397		
	Total	247.386	615			
Knowledge Management	Between Groups	10.659	4	2.665	5.262	.000
	Within Groups	308.435	609	.506		
	Total	319.094	613			
Org Excellence	Between Groups	9.934	4	2.484	5.786	.000
	Within Groups	261.427	609	.429		
	Total	271.362	613			
Org Learning	Between Groups	20.119	4	5.030	8.732	.000
	Within Groups	350.213	608	.576		
	Total	370.332	612			
Org Innovation	Between Groups	15.283	4	3.821	7.908	.000
	Within Groups	291.341	603	.483		
	Total	306.624	607			

Table (6-13) examine the size of differences between the position groups in the five organisation development practices. Procedure one-way ANOVA was performed on the data set. The results show that two out of five organisational development practices (KM and OC) statistically vary according to position groups. ANOVA test shows that OE, OL, OI do not statistically vary between and within groups according to position.

Table (6-13) ANOVA differences (or similarities) between Position groups

		Sum of Squares	df	Mean Square	F	Sig.
Org Competitiveness	Between Groups	2.908	4	.727	1.846	.119
	Within Groups	233.598	593	.394		
	Total	236.506	597			
Org Knowledge Management	Between Groups	2.344	4	.586	1.138	.338
	Within Groups	304.296	591	.515		
	Total	306.640	595			
Org Excellence	Between Groups	5.511	4	1.378	3.160	.014
	Within Groups	257.678	591	.436		
	Total	263.189	595			
Org Learning	Between Groups	7.735	4	1.934	3.279	.011
	Within Groups	347.978	590	.590		
	Total	355.713	594			
Org Innovation	Between Groups	6.858	4	1.714	3.514	.008
	Within Groups	285.446	585	.488		
	Total	292.303	589			

6.6 Correlation Analysis

The Gaski approach for validation was applied using Pearson correlation along with Spearman's correlation coefficient to allow further comparison of relationships and dependence between different indicators in the five prevalent organisational development practices. The five organisation development 50 indicators were correlated with each other to determine or gauge the validation of index operationalisation. As shown in Appendix (7), for all 50 indicator areas both the Spearman's non-parametric correlation coefficient and the Pearson correlation index were found to be significant at 0.01 levels and generally strong.

The results of the correlation coefficients point that participants from top and middle management of GO were consistent in their answers regarding the importance ranking scores of the KM and OC relation with OE , OL and OI. This procedure helped determine whether there was a significant correlation between the KM and / or OC with the other three main variables indicators which addresses the *first objective* of the research. The

positive direction of the coefficient further pointed that the areas perceived to be important by the top and middle management partly addresses the *third research objective.*

In Chapter Three, factors referred as hypothetical constructs were developed to explain the inter-correlations among the variables (Robson, 2002), therefore in order to identify that a set of variables have something in common, a bivariate correlation analysis was conducted within the selected constructs. The Pearson correlation was conducted to establish the relationships between each of the construct variables where a measure of the relationships extent between each of the variables within the measures of KM, OE, OL, OI and OC was conducted as shown in detailed tables of Appendix (7). For example, the bivariate relationship between any two key prevalent practices were tested to measure their degree of association, e.g. (KM-OC); a positive value for the correlation implies a positive association (large values of KM tend to be associated with large values of OC) and (small values of KM tend to be associated with small values of OC). A negative value for the correlation implies a negative or inverse association (large values of KM tend to be associated with small values of OC) and vice versa. Upon inspection of each of these matrices it was observed that a large number of inter-correlations existed within many of the construct measures. However, a more accurate method of analysing such complex relationships using a mathematical model is the principal component analysis (PCA) which is able to decompose the original data into a set of linear variants (Dunteman, 1989). Therefore, a process of factor extraction was performed in order to reduce the data set in a more manageable size while maintaining the original information.

The correlations presented in Appendix (7) shows strong correlation with all indicators showing for example how OC and *analytical capabilities that leads to learning from mistakes* (q17) are highly correlated. On the other hand, (q13) on *creating a good profitable income for government with return on investment*; was weakly correlated with most of the other organisational development variables. Among the series of correlations within selected constructs of KM, the correlations of KM appeared to have stronger correlation than OC correlations. The high correlation found among the different indicators seemed to be logical for government experts. For example, (q22) starting *an organisation*

that has clearly defined and documented KM strategies was highly correlated with (q27) where *decision making process depends on amount knowledge transferred.* The same can be seen with (q201) where *clear process of capturing the collective expertise and intelligence* is found to be the strongest indicator that correlates with the rest of OC indicators. This suggests that KM can be the first point before reaching the OC and this supports ***H1, H2, H3*** and ***H4*** further.

Results indicate that the *government organisation practice of continuous environmental reviews relevant to performance improvement* (q301) is highly correlated with all constructs of organisational excellence. The correlations within the constructs of organisational learning reveal that having *interaction sessions that enhances sharing of experiences* (q48) is highly correlated with the *practice of setting proper programs which closes skill gaps and enhances proficiency* (q49). Both these indicators were found to highly correlate with all other constructs. Organisational innovation constructs has positive correlations at 0.05 level ($p<0.05$) with highest correlation coefficients when the *organisation combines the knowledge with results to build new products and /or services* (q55). The following sub-sections focus specifically on the correlations of the two main pillars of the study, KM and OC and examine how the defined prevalent organisational development practices correlate with them.

6.6.1 Organisational Competitiveness Correlations

As part of the *second* then *third objectives* of the study the researcher wanted to determine which of the organisational development practice variables from OE, OL, and OI influence OC. The strongest correlation with organisational competitiveness (OC) was when *organisations analytical capabilities lead to learning from mistakes* (q17). The lowest correlation was between *the ability of the organisation to create a good profitable income for the government with clear return on investment* and the other prevalent organisational development variables (q13). The following detailed sub sections present the relationship between OC and the four remaining organisational prevalent practices.

6.6.1.1 The relation between KM and Organisational Competitiveness (OC)

The researcher starts with reporting on the overall correlation of KM-OC, the theme of this study, which shows an overall positive correlation strength of (0.766) at the 0.00 level ($p<0.05$). Furthermore, at the same level of significance with ($p<0.05$) a correlation strength of (0.561) on the statement of *effective management of knowledge assets would generate new ideas* (q29) was found to be highly significantly correlated with the *practice of having analytical capabilities and learning from mistakes* (q17). The lowest correlated coefficient (0.049) in this categorical dimension was found between (q23) that reflect the practice of *implementing KM policies to improve its service delivery* and (q13) stating GO would *create a good profitable income for government with return on investment*, which also seem logical as KM policies can only indirectly affect profitable income of the organisation. This supports previous work discussed in Chapter Two (Wiig, 2002; Keating and Weller, 2001; Migdadi, 2000; OECD, 1996).

6.6.1.2 Relation between Organisational Excellence (OE) and Organisational Competitiveness (OC)

An overall positive correlation between OE-OC showed (0.761) of strength at 0.00 level with ($p<0.05$), where the highest significant correlation was at (0.500) existed between having *organisational leaders pinpointing the change needed while providing all necessary resources* (q31) and *having organisational future plans that ensure sustainability of services* (q16) which reflect the *importance of leadership on creating organisational competitiveness.* While the lowest correlation coefficient (0.112) was seen between (q34) ensuring that *employees know their responsibility towards customers within the organisation objectives*, and (q13) which is about *creating a good profitable income for government with return on investment.*

6.6.1.3 The relation between Organisational Learning (OL) and Organisational Competitiveness (OC)

OL-OC showed an overall positive correlation at 0.00 level with ($p<0.05$) was (0.681) where the highest correlation among the various indicators of the two dimensions was at (0.494) which existed between the practice of *encouragement and cultivation by the organisation for multiple viewpoints and open productive debates* correlates (q43) and the *analytical capabilities that leads to learning from mistakes* (q17). While the lowest correlated coefficient (0.059) was found between *conducting Lessons learned sessions* (q45) and (q13) *creating a good profitable income for government with return on investment*, which seemed logical as they are totally from different fields.

6.6.1.4 The relation between Organisational Innovation (OI) and Organisational Competitiveness (OC)

OI-OC showed an overall positive correlation at 0.00 level ($p<0.05$) was (0.713) where the highest correlation among the various indicators of the two dimensions was at (0.485) on adapting the practice of *clear social networks in the organisation which supports the innovative capabilities* (q51) and having *analytical capabilities that leads to learning from mistakes* (q17) which seem to *synergise the organisation development in innovation.* While the lowest correlated coefficient (0.087) related between having the practice of *clear social networks that supports innovative capabilities*, and *creating a good profitable income for government with return on investment* (q13).

6.6.2 KM Correlations with Organisational Development Variables

Generally, all correlations of the four prevalent practices with KM are found to be stronger than with OC correlations. Having *clear process of capturing the collective expertise and intelligence* (q201) is found to be the strongest indicator that correlates with the rest of OC indicators. This indicates that KM can be the first point before reaching the OC and this supports ***H1, H2, H3,*** and ***H4*** again. Appendix (7) shows the correlations tables for and between organisational developments main variables which are discussed in details in the following sub-sections.

6.6.2.1 The relation between KM and Organisational Excellence (OE)

KM-OE relation shows an overall positive correlation at the 0.00 level with ($p<0.05$) among the various indicators of the two dimensions was (0.805), where the highest significant correlation (0.585) was on the practice of *meeting best service delivery at best quality and best cost* (q36), and related to (q29) which was about the *practice of effectively managing knowledge Assets to generate new ideas.* The lowest correlated coefficient (0.341) in this relation was found between (q34) where the *employees knows their responsibility towards the customers along with organisation's objectives*, and *the practice of implementing KM Policies to improve the service delivery* (q23).

6.6.2.2 The relation between KM and Organisational Learning (OL)

KM-OL relation showed an overall positive correlation at the 0.00 level ($p<0.05$) is (0.753), where the highest correlation among the various indicators of the two dimensions was (0.555) existed between *establishing proper programs that close skill gaps while enhancing proficiency* (q49), and *managing to have clear process of capturing the collective expertise and intelligence* (q201). The lowest correlated coefficient (0.330) in this relation was found between having (q41) employees feeling free to speak their minds about what they have learned, and (q22) GO's having *clearly defined and documented KM strategies*; which seemed logical as they are not related to each other.

6.6.2.3 The relation between KM and Organisational Innovation (OI)

KM-OI relation showed an overall positive correlation at the 0.00 level ($p<0.05$) is (0.766), where the highest correlation among the various indicators of the two dimensions was (0.583) existed between *establishing mechanisms that harness the innovativeness of key individuals and teams to create value* (q54), and (q201) having a *clear process of capturing the collective expertise and intelligence.* This tends to support the work of (Lucas, 2010; Njuguna, 2009; Rhodes et al., 2008). While the lowest correlated coefficient (0.312) in this categorical dimensional relation was found between (q58) *having all the facilities that*

enhance team work, and (q28) having the *practice of always sharing the organisational knowledge with partners*.

The overall finding from the correlations shows the need for subsequent structural modelling to generalise the KM influence holistic relations on the other variables.

6.7 Multivariate Analysis

The researcher conducted multivariate analysis techniques which allow more than two variables to be analysed at once. This analysis was carried by having the one (or more) of the dependent variables be explained or predicted by the others through regression analysis. Data reduction through Principle Component Analysis (PCA) and Confirmatory Factor Analysis (FCA) was performed by the researcher in this study in order to establish the variables relations and model specifications. Furthermore, structural equation modelling (SEM) and path analysis were used to develop a holistic KM approach. The following section will discuss in detail each of the mentioned methodological approaches utilised in this research.

6.7.1 Regression Analysis and Hypothesis Testing

This section contains results of the analysis used to test the hypotheses proposed in Chapter Three. Regression analysis were carried to examine the relationship between variables especially the extent to which a dependent variable is a function of one or more independent variable, (Neuman, 2003). Multiple regression analysis was used to examine the proposed research hypotheses and to support the prediction of an outcome from various predictors. Data were examined against the assumptions of the model used in this study. The diagnostic tests of linearity, homoscedasticity, normality and multicollinearity have been conducted in order to confirm that the regression analysis has met the validity requirements (Greene, 1993). The detection of linearity is examined by F-statistic and its associated significant level. F statistic in most of the regression analysis was found to be low and not significant at the 0.05 levels. Therefore, the linearity test confirmed the appropriateness of the regression model. Residual analysis of the data revealed that

heteroscedasticity was not present while through testing the interdependency of the independent variables showed that multicollinearity is found to exist, since there is a strong correlation between two or more predictors in the regression model (Neuman, 2003). This prepared the data for the next step of analysis, the hypothesis testing.

Through the regression analysis, four hypotheses were tested. The hypotheses went through rigorous tests to see whether the hypnotised relationships can be confirmed or not. The *first hypothesis H1* proposed a positive association between KM and Organisational Competitiveness (OC). This hypothesis has been investigated with correlation analysis and linear regression model. Results derived from the multiple regression analysis as per table of (A-11-6a) in Appendix (11) concluded that there is a significant finding and a higher t-value for the *analytical capabilities of the organisation that leads to learning from mistakes* (q17) than other indicators in the same (OC) dimension. All the indicators determining OC were found to have positive coefficients, except (q13) *creating a good profitable income for government with return on investment*. All indicators in the multiple regression models were significant except (q13) *creating a good profitable income for government with return on investment*, (q14) *organization has the ability to react to customer demands* and (q18) *organizational has a unique way in dealing with customers with intimacy*. Furthermore, a simple regression model examining the influence of KM on organisational competitiveness was developed, Table (A-11-1c) in Appendix (11). The results of this simple regression analysis confirm the hypothesised relationship between KM and OC at the 0.05 level.

The *second hypothesis H2* proposed a positive association between KM and Organisational Excellence (OE). Same as the steps carried for testing H1, this hypothesis has been investigated with linear regression model. The results derived from the multiple regression analysis in table (A-11-6b) in Appendix (11) concluded with significant findings and the t-value was most for *effective organisation communication between all the levels of management* (q37) than any other indicators. All the indicators determining OE were found to have positive coefficients, except (q34) *organisation ensure that employees knows their responsibility towards the customers and organization's objectives*. All indicators in the multiple regression models were significant except (q34) where the *organisation ensure*

that employees knows their responsibility towards the customers and organization's objectives and (q35) where the *organisation is expected to have close, long-term relationships with its partners designed to resolve quality-related problems.* Furthermore, a simple regression model examining the influence of KM on organisational excellence was developed, Table (A-11-2c) in Appendix (11). The results of this simple regression analysis confirm the hypothesised relationship between KM and OE at the 0.05 level.

The *third hypothesis H3* proposed a positive association between KM and OL. Same as the steps carried for testing H1 and H2, this hypothesis has been investigated with linear regression model. The results derived from multiple regression analysis concluded with significant findings as in table (A-11-6c) of Appendix (11). The t-value was more for *turning organisation mistakes into constructive learning experiences* (q42) than any other indicators. All the indicators determining OL were found to have positive coefficients, except (q43) *organization encourages and cultivates multiple viewpoints and open productive debates.* Furthermore, a simple regression model examining the influence of KM on organisational learning was developed, Table (A-11-3c) in Appendix (11). All indicators in the multiple regression models were significant except (q41) *employees feel free to speak their minds about what they have learned* and (q43) where *organization encourages and cultivates multiple viewpoints and open productive debates.* The results of this simple regression analysis confirm the hypothesised relationship between KM and OL at the 0.05 level.

The *fourth hypothesis H4* proposed a positive association between KM and Organisational Innovation (OI). Same as the steps carried for testing H1, H2 and H3 this hypothesis has been investigated with linear regression model. The results derived from multiple regression analysis concluded with significant findings as in table (A-11-6d) Appendix (11). Before finding out the positive association between the KM and OI, it was decided to apply the regression analysis for the indicators deciding on the Organisational Innovation. The results derived from regression analysis concluded with significant findings and the t-value was more for *combining the organisation knowledge with results to build a new products and / or services* (q55) than other indicators. All indicators in the multiple

regression models were significant except (q53) where *organisation business results focus should be based on customers and understanding changing demands*, (q58) where *organization has all the facilities that enhance team work and* (q59) where *organisation is expected to have the ability of speeding up creative ideas*. Furthermore, a simple regression model examining the influence of KM on organisational innovation was developed, Table (A-11-4d) in Appendix (11). The results of this simple regression analysis confirm the hypothesised relationship between KM and OI at the 0.05 level.

6.7.2 Principal Component Analysis (PCA) and Factor Analysis

As per the discussion in Chapter Four, the procedure of Principal Component Analysis (PCA) is used in this study as a method of data reduction before testing the hypothesis and specifically before running the model on CFA. The sample size of this study being above 500 is in very good position for PCA test with minimum computational difficulties (Tabachnick and Fidell, 2007). The tables of communalities extracted and rotated component matrix for PCA are presented in Appendices (13) and (14). The PCA supports both *discreminant and convergent validity* (alpha of the factor) in comparison to results of up scales that are represented in the reliability and construct validity discussed in Section (6.3.2). Taken together, these tests provide a minimum standard which should be passed before a principal components analysis (or a factor analysis) should be conducted.

Kaiser-Meyer-Olkin's (KMO) measure of sampling adequacy and Bartletts test of spherisity been conducted prior principle component analysis (PCA) assuring the test appropriateness. PCA assumes no unique or error variance and is concerned with establishing which linear components exist within the data and how a particular variable might contribute to the component. Varimax orthogonal rotation was employed in order to produce factor solutions because it simplifies the interpretation of factors and attempts to maximise the dispersion of loadings within factors. Factor analysis is a data reduction method that is used as a tool in an attempt to reduce a large set of variables to a more meaningful smaller set of variables. Because each variable was measured by multi-item constructs, factor analysis with varimax rotation was adopted to check the uni-

dimensionality among items. The researcher conducted two types of PCA, in the first case the factors were extracted naturally which show the variables load to each factor regardless of the existing literature. In this case, an explanatory factor analysis was conducted; where specific factors were extracted according to the specific data set. Thus, factors were extracted according to how certain variables describe each construct within the GO's context. In this case, factors were extracted according to how the government executives perceive certain constructs. The researcher has labelled the factors according to the literature and according to items that better describe each factor. In the second case, the researcher employed factor analysis specifying the number of factors extracts, in other words as they exist in the existing conceptual model. The labels were given according to existing literature (Chen et al., 2001).

6.7.2.1 Data Screening

Initially significance values were scanned for cross-correlation at 0.05 and looked for any variable for which the majority of values are greater than 0.05. The determinant value is 7.74E-016 which is less than 0.00001. Since multicollinearity is an issue here, where two or more variables were found to be highly correlated, the researcher tried to recognise whether the existence of multicollinearity is happening during the regression analysis thus present in the data. For example, testing KM variables to have or not to have excessive relationship (i.e. multicollinearity) with OC before running any regression analysis assures that the results are not too biased.

6.7.2.2 Factor Structure

PCA with varimax rotation was performed on the set of variables determining the five survey dimensions for the purposes of scale development. Five factors with Eigen values greater than one were extracted. In order to enhance the factor solution of PCA one item was deleted from the analysis because it lacked variations and caused interpretability problems at conceptual level. This item was indicator (q13) which addressed *whether GO's can create a good profitable income for government with return on investment.* Deleting

this item was considered appropriate as it was the lowest repeatedly correlated indicator to all the organisational development variables (i.e. OE, OL and OI), including KM.

The factor configuration as per Table (6-14) indicates that the first four factors were found to explain 59% of the total variance. Kaiser – Meyer – Oklin (KMO) measures of sample adequacy and consequently Bartletts test of sphericity were conducted on the data. For these data, the value of KMO is 0.976 which falls into the range of being superb; this should help boost the confidence on the factor analysis as being an appropriate tool of analysis for the study data. Bartlett's measure tests of the null hypothesis (H_0: correlation matrix= identity matrix, in other words, that the variables are uncorrelated). For these data, Bartlett's test is highly significant ($p<0.001$), indicating the appropriateness of the factor analysis method used in this research.

The list of the eigenvalues associated with each linear component (factor) before and after extraction and before excluding the extreme variables is shown in Table (6-14). Before extraction, SPSS has identified 49 linear indicators (49 Questions since q13 was omitted) and have not shown the components below an eigenvalue of 1.0 within the data set, where the default cut off eigenvalue was set at 1.0. The eigenvalue for a given factor measures the variance in all the variables which are included in that factor. Hence the researcher conducted factor analysis on the condition matrix where the variables were standardized which means each variable has a variance of 1.0. Details of factor component are explained in Section 6.7.2.3.

Table (6-14) **Total Variance Explained**

Factor Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23.049	47.038	47.038	23.049	47.038	47.038
2	2.167	4.422	51.460	2.167	4.422	51.460
3	1.503	3.068	54.528	1.503	3.068	54.528
4	1.106	2.257	56.784	1.106	2.257	56.784
5	1.072	2.189	58.973	1.072	2.189	58.973

Extraction Method: Principal Component Analysis.

As per Table (6-14) the eigenvalues associated with each factor represent the variance explained by that particular linear component. SPSS displays the eigenvalue in terms of the percentage of variance explained (so, factor component 1 explains 47.038% of total variance). Thus it is clear that the first few factors explain relatively large amounts of variance (especially factor 1) whereas subsequent factors explain only small amount of variance. SPSS extracts all factors with eigenvalues greater than 1, which leaves five factors as shown in Table (6-14). The eigenvalues associated with these factors are again displayed (and the percentage of variance explained) in the columns labelled extraction sums of squared loadings. The values in this part of the table are the same as the values before extraction, except that the values for the discarded factors are ignored, henceforth the first five components explain 59 % of the variance again.

The amount of variance in each variable can be explained by retained factors represented by the communalities after extraction. Before extraction, the communalities are reflected in the column labelled extraction sums of squared loadings in Table (6-14), where extraction reflects the common variance in the data structure and where the PCA works on the initial assumption that all variance is common. So it can be claimed that 47.038% of the variance associated with factor 1 is common, or shared variance. Another way to look at these communalities is in terms of the proportion of variance explained by the underlying factors, where after extraction some of the factors are discarded and so some information is lost.

The researcher used factors analysis as an exploratory tool to support the decision making regarding factors extraction. The first decision is about the number of factors to be extracted where by Kaiser's (1960) criterion five factors can be extracted. However, this criterion is accurate when there are less than 30 variables and communalities after extraction are greater than 0.7 or when the sample size exceeds 250 and average communalities is greater than 0.6. In the case of this study, none of the communalities shown in above table exceeds 0.7, furthermore the average of the communalities is found by adding them up and dividing by the number of communalities (28.898/49=0.590).

Hence, on both grounds Kaiser's rule, providing recommendations for much smaller samples, may not be accurate, especially if one considers the huge sample. The Scree plot was used for this purpose, appendix (9) shows the Scree Plot where the first five components loading represent 59% of total components variance. The curve begins to tail off after three factors, but there is another drop after five factors before a stable plateau is reached, therefore it is probably safe to assume Kaiser's criterion. However, there is an option to re-run the analysis specifying that SPSS extract only two factors and compare the result. In this study it can be seen that once the sixth component is on, one can see that the line is almost flat, meaning that each successive component is accounting for smaller and smaller amounts of the total variance. Hence, PCA here helps in redistribution of the variance in the correlation matrix.

The matrix of the factor loading is performed for each variable and into each factor as shown in Appendix (14) where the rotated component matrix contains all information except that it is calculated after rotation. There are several things to consider about the format of this matrix where the factor loadings has been less than 0.4, hence if this matrix is compared with the un-rotated solution, then most variables are loaded highly onto the first factor and the remaining factors. The rotation of the factor structure has clarified things considerably; there are five factors and variables that load very highly onto only one factor (with the exception of one factor). The next section gives more interpretation for each of the extracted data. The questionnaire reflects five different organisational development practices (dimensions) that were subjected to PCA which extracted five factors that represents the five constructs in the conceptual model originally proposed.

6.7.2.3 Interpretation of Extracted Data

The CFA procedure was performed again after deletion of the extracted factors. The procedure has shown less percentage of variance leading to accepting the basic PCA solutions, where the extracted factor was deleted based on the factor loading. Five factor components were extracted accounting for 58.973% of the total variance, which mean that the variable maximization is acceptable.

The first factor is composed of indicators, (q41) *Our organisation employees feel free to speak their minds about what they have learned,* (q43) *Our organisation encourages and cultivates multiple viewpoints and open productive debates*, (q401) *Our organisation involves personnel in important decisions.* All items within this factor were characterised by elements of OL. The second factor is composed of indicator (q56) *(Our organisation brings new products and/or services on a yearly basis).* All items within this factor were characterised by elements of OI. The third factor is composed of indicators, (q23) *(Our organisation has implemented KM Policies to improve its service delivery),* (q26) *(Our organisation managed to build up an ability to capture knowledge which is used to develop specific programs),* (q22) *(Our organisation has clearly defined and documented KM strategies),* (q25) *(Our organisation has a listing of all Knowledge Assets inventory),* (q24) *(Our organisation is acquiring knowledge while modifying its behaviours accordingly).* All items within this factor were characterised by elements of KM. The fourth factor is composed of indicators, (q34) *(Our organisation ensure that employees knows their responsibility towards the customers and organisation's objectives),* (q35) *(Our organisation has close, long-term relationships with its partners designed to resolve quality-related problems),* (q33) *(Our organisation continuously reviews its progress towards achieving strategic objectives.),* (q38) *(Our organisation work on values that are reflected into the society and its ability to collaborate with other organisations).* All items within this factor were characterised by elements of Organisational Excellence. The fifth factor composed of (q18) *(Our organisational has a unique way in dealing with customers with intimacy),* (q14) *(Our organisation has the ability to react to customer demands),* (q12) *(Our Organisation adopts quickly to unanticipated change), (q15) (Our Organisation always streamline it processes).* All items within this factor were characterised by elements of Organisational Competitiveness. The next section would use the extracted factors from the principal component analysis (PCA) to construct the scale indices.

6.7.3 Construction of scale Indices from the Extracted Factors

After a thorough examination of extracted factors, indices had been constructed from each factor solution according to scale reliability and validity criteria. Psychometric

characteristics were measured in factor analysis by procedure Cronbatch alpha for reliability and discrimination variation for validity. The variables loadings factors of coefficients greater than 0.40 were used to construct the scale indices, as discussed in the following sections (Devellis, 1991).

6.7.3.1 Reliability of Scales Indices

The Cronbach alpha coefficient was used to assess the reliability of the construct and to validate a questionnaire (Cronbach, 1951), where an acceptable value for Cronbach's alpha is between 0.7 and 0.9. Nunnally's (1967) argued that alpha coefficient of 0.50 or greater is adequate to conclude internal consistency. All scales were found to satisfy this reliability criterion with Cronbach alpha coefficients ranging from 0.8 to 0.95 as shown in Appendix (6) series.

6.7.3.2 Validity of Scales Indices

The notion of validity is derived from the positivism defined by a systematic theory of validity. Applying positivism, the researcher used quantitative research to determine whether the measures truly measure what was intended to measure or how truthful are the research results, which address the construct validity (Neuman, 2003).

Validity of the scale was checked based on the set of measures that accurately represented the concept of interest (Devellis, 1991). In order to be able to make decisions regarding reliable constructs, the following features of the solution must be studied: unidimensionality, convergent validity, reliability and discriminant validity. Unidimensionality means that a set of variables only has underlying dimension in common. To study unidimensionality variables measures must have a high loading (> 0.50) on the latent variables and must be significant (critical ratio = C.R. = t-value > 1.96). From Table (6-15) shown in Section (6.7.4.3), all the variables are significant because C.R. > 1.96, however only one variable (KM-OE) has a high load > 0.50.

Two techniques were used to test construct validity where the Confirmatory Factor Analysis (CFA) was used to confirm the factors that shows the latent construct, while Explanatory Factor Analysis (EFA) (represents a discriminant and predictive validity). The validity was tested by correlating the scale item with the scale itself. It has been demonstrated that the coefficients were relatively high and at the expected direction. The correlation coefficients were significant at 0.001 and the items were found to significantly contribute to the measurement of construct. The study procedure for convergent validity was run through factor analysis in order to indicate the degree to which two indicators of latent variable confirm one another. A procedure for evaluation of convergent and discriminant validity was performed through PCA (EFA) as shown in table (6-15) where all C.R.'s were greater than 1.96. This findings about convergent and discriminant validity demonstrate that collateral evidence exist to estimate the degree of construct validity. Construct Validity provide evidence that the questionnaire of five prevalent organisational practices are related to one general construct. Discriminant validity is achieved when the correlation between constructs differs significantly from 1 or the Chi square difference tests indicates that two constructs are not perfectly correlated. Discriminant validity shows that measures of the five prevalent organisational practices that should not be related are in reality not related. The researcher concludes from the correlation matrix, Appendix (8), that evidence from both convergent and discriminant validity exists.

6.7.4 Structural Equation Modelling (SEM) path diagrams

In order to address the *third research objective* and as part of the research design fifth stage presented in Chapter Four. SEM was conducted to examine the possibility of achieving goodness of fit for the proposed framework model. This should help both confirming the possibility of the proposed model where all five main variables are inter-related thus proposing future research on the model (Zikmund, 2003). Since this research used a comprehensive statistical approach to test hypotheses about relations between observed and latent variables, SEM was conducted using Analysis of Moment Structures (AMOS) statistical software. SEM was used by the researcher on the model through its confirmatory

approach to assess and correct the measurements errors and provide explicit estimates of the parameters (Klem, 2000).

The main reasons for choosing AMOS over LISREL and EQS software is its simplicity and the understanding of the potential relationships among the main variables (Blunch, 2008). However, this required presenting a precise model reflecting the tested framework called path diagram. Path diagrams are clear way of summarizing an SEM model and generating the necessary equation statements to fit the models. Observed variables were drawn as boxes, latent variables were drawn as circles or ellipses; while the error term in the path diagram is drawn as latent, errors are estimated, not directly measured. The relationship between the variables is drawn as a directed or one-headed arrow, when one variable is believed to cause another variable.

6.7.4.1 Data analysis Using CFA and SEM

In order to establish the variables relations and model specification, factor analysis was carried out in this research to ascertain and prudent statistically whether the developed model and relevant survey captured the different dimensions and factors of KM and other organisational development. The two type of factor analysis are distinguished for suitability of use depending on whether it is needed to explore patterns in the data or to test explicitly stated hypotheses. CFA, used here as a theory-driven, where it is possible to place substantively meaningful constraints on the factor model, such as setting the effect of one latent variable to equal zero on a subset of the observed variables. CFA as discussed earlier in Chapter Four is a special case of the SEM, which is the covariance structure. The study benefited from CFA in allowing testing hypotheses for a particular factor structure (Chen et al., 2001). SEM consists of two components, a measurement model linking a set of observed variables to a usually smaller set of latent variables; and a structural model linking the latent variable through a series of recursive and non-recursive relationships. It is common to display CFA models as path diagrams as shown in the coming sections and Appendix (15) in which squares represent observed variables and circles represent the latent concepts. Through using SEM, variables are classified as endogenous or exogenous

and as observed or unobserved. An endogenous variable is one which is predicted in a regression equation while variables not being predicted by regression equations are called exogenous variables.

Thus various indicators pertaining to assessment of KM, OE, OL, OI and OC are observed endogenous variable, error in the unobserved variables are called exogenous variables. The observed variables are represented by boxes while unobserved variables are represented by circles or ovals. The error terms are given the arbitrary weight of 1 so as to make the parameters in the model estimable. Single-headed arrows are used to imply a direction of assumed causal influence, and double-headed arrows are used to represent covariance between two latent variables. Five model runs were performed in order to measure and evaluate the relations between the different variables. First model run called (Model run-1) and (Model run-2), represents the proposed model under study with one way pointed arrows used to indicate the correlations and the covariance's for all the necessary relations and directions being drawn and tested on the holistic practices in the KM-OC model; i.e. relation from KM to all the four prevalent organisational development practices (OE, OL, OI and OC) and then relation from the three practices (OE, OL and OI) towards OC. In order also to test whether the holistic influence model would be different if the model stops only with one arrows from KM to all the four practices (OE, OL, OI and OC), Model run-3 and Model run-4 were carried out. While Model run-1 and Model run-3 indicate causal effects, Model run-2 and Model run-4 are a replicate of the main model runs 1 and 3 however with fewer indicators. Model runs-2 and 4 were performed after carrying out the PCA in which 11 variables were removed.

6.7.4.2 Assumptions of using Structural Equation Modelling (SEM)

Reference to the model runs discussed in the earlier section and presented in section 6.7.5 and partly reflected in Appendix (15); path analysis was performed in addition to developing SEM. Chi-square ($\chi 2$) statistics is the main measure that determines goodness of fit– and hence it is an index that evaluates how close the observed variance (current

model) to covariance matrix (ideal model) is to the estimated matrix. The results from data analysis shown at the probability level = 0.000 indicating a poor fit.

6.7.4.3 Model Maximum Likelihood Estimates

Maximum Likelihood assumes that the underlying variables are normally distributed. When the **X** variables are measured as deviations from their means it is easy to show that the sample covariance matrix for **X** to determine whether the specified model is identified. Through CFA, a model is identified if all of the unknown parameters can be rewritten in terms of the variances and covariances of the x variables (Schumacker and Lomax, 2004). In this research, the maximum likelihood estimates shows that the standardized residuals are not a technically fit index, but can provide information about how closely the estimated matrix corresponds to the observed matrix in other words how well the data fits the model.

The estimates shown in table (6-15) the desired standardized residuals are closer to 0 which means there is little or no difference between observed covariance and estimated matrix. The relation between KM and OE showed a high estimate of 0.868 while OC and KM estimates were 0.412 which is a bit below the required high loading of > 0.50. The relation of OL and KM dimensions had a negative relation where the estimates had -0.227, while the critical relation shows the t-value was -9.457. As for OI and KM was 0.251, i.e. below the required high loading of > 0.50. This reveals the inverse association between these two variables within the model parameters. Table (6-15) reflects the estimates between the five organisational development practices where only KM-OE is seen to be the most suitable path for the proposed model.

Table (6-15) Estimates between each of the five variables

			Estimate	S.E.	C.R.	P	Label
ORG COMP	<-->	ORG KM	.412	.024	17.121	***	
ORG KM	<-->	ORG EX	.868	.016	55.511	***	
ORG KM	<-->	ORG LEAR	-.227	.024	-9.457	***	
ORG INN	<-->	ORG KM	.251	.024	10.324	***	

The model fitness indicates how good is the model in explaining how 'fit' the data are in the model run test. The Chi-square ($\chi 2$) statistics is the main measure to determine goodness of fit– where the index evaluates how close the observed variance-covariance matrix is to the estimated matrix.

With reference to the *third research objective*, after running the proposed model for five times, with different data manipulation and reduction; results of Model run-1 shows a positive relationship through the covariance 0.412 exists between KM and OC. Similarly, KM and OE have shown positive relation through a covariance of 0.868. The KM and OI relations showed a positive relation through the covariance 0.251. While the relation of KM and OL have shown a negative relation through the covariance -0.227. The last result coincides with the work of Lopez et al. (2004) where they proposed that KM and learning must go hand-in-hand in order to develop organisations. References in Chapter Four recognised the existence in the literature the overlapping between KM and OL indicators. This was confirmed through Model 3-run where e52 and e54 shown variances to be negative, i.e. -0.036 and -0.008 respectively. It is worth to remember that as far as the negative relation between KM and OL is concerned it reflects the importance of the independence between both. Hence, KM was defined as *the systematic and organised attempt of practices for creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance excellence performance, learning and innovation within the organisation in order to provide services to the public and to improve performance.* While, OL is defined as: *the ability of the organisation to grasp learning opportunities and reflect it into the culture which would lead for better organisational development practices;* whether this learning comes from within the organisation or learning from others. It is internal processes that organisations utilize to convert their learning and capital-based resources into desired outputs.

6.7.5 Baseline Comparisons and Models Fit Analysis

Determining the overall fit and general quality of the measurement model reflects the degree and extend of the covariance matrix generated corresponds to actual covariance. The

model fitness was done to show how good the model is in explaining the data as per the *third research objective.* The Chi-square ($\chi 2$) results that guides to non-model fit are discussed under each model run. Set of guideline table for reference on the overall model fit as referred to by Schumacker and Lomax (2004) is shown in Appendix (15).

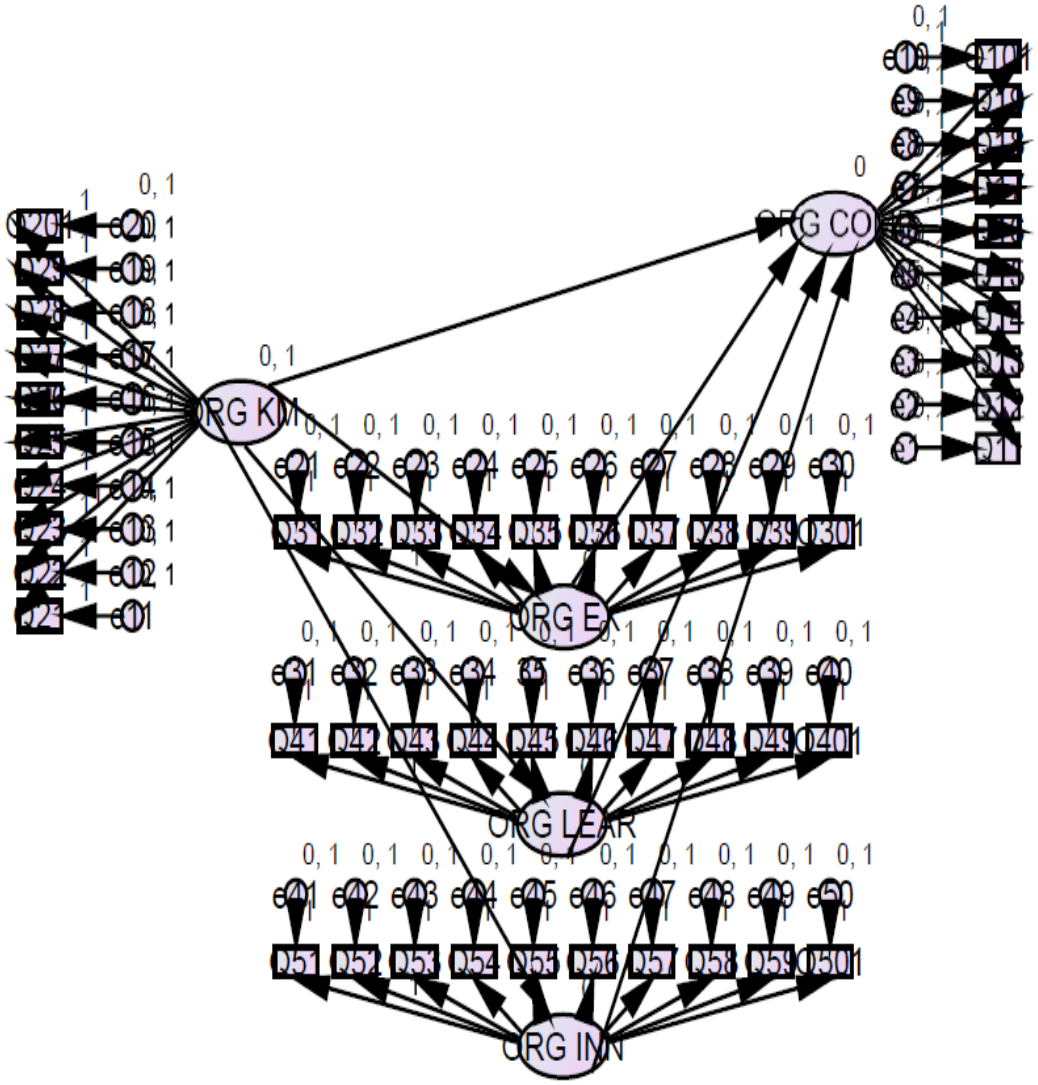
The model was run five times with five model runs, model runs 1, 2, 3 and 4 representing the positive one way direction from KM towards each of the four prevalent development practices (OE, OL, OI and OC). However, the model runs 1 and 2 have a continuation of arrows that flows (OE, OL and OI) as *intermediate variables* towards OC. The fifth model run was developed to examine whether the two side direction (path), i.e. influence of each of the prevalent variables would have a major influence on the model fit. The fifth model run-5, which is drawn the same as in model run-2 but with double sided arrows, is presented in Appendix (15) for further reference only, since it did not give any difference in results. Model Runs-3 and 4 shows there is one independent variable that is KM. In order to confirm fitness of the model, an incremental fit index was carried out, where all incremental indexes should be greater than 0.90 for a goodness of fit model to occur. As per Appendix (15) the guideline for the Comparative Fit Index (CFI) should range from 0 – 1, where 1.0 indicates perfect fit and where it is recommended to have CFI$\geq$ 0.95 (Schumacker and Lomax, 2004, Hu and Buttler, 1999). For GFI, AGFI, ANFI and CFI recommended values as per the set of guideline for overall model fit, in table (A-16-1), exceeding 0.9. These indices generally indicate the relative fitness of the model.

6.7.5.1 Model Run-1

The model was run five times to address all the necessary relations and directions, thus targeting both the *second and third research objectives,* but without forcing the data. Model runs-1 and Model run-3 were based on the literature review. Therefore the holistic influence in the model gives an exploration of all the relations that are necessary to address the *third research objective*. Model run-1 is the basis for the positive one way main KM-OC model proposed for this study, where the flow starts from KM to each one of the four prevalent organisational development practices (OE, OL, OI and OC) and then from each

of the three intermediary practices (OE, OL, and OI) towards OC. Model run 1 is presented in Figure (6-1).

Figure (6-1) Model Run-1 (KM-Organisational Development Practices-OC), with full 50 indicators



Tables (6-16 a) through (6-16c) reflect the increment and absolute goodness of fit indices for Model run-1. The Chi-square ($\chi 2$) value (20742.763) for the evaluated model is with 1275 degrees of freedom and has a corresponding p-value of 0.000; which evaluates that the observed variance is distant to covariance matrix thus the model is not fit. The relationship between the Chi square value and the number of degrees of freedom does not satisfy the assumed criterion (16.269 > 2.0) which indicates the quality of the model is not

fit. Additionally the RMSEA is 0.156, is higher than the 0.1 cut-off indicating a poor fit (Byrne, 2011, Jansen et al., 2008). Therefore, the proposed model again could not show a good fit.

Table (6-16 a) CMIN for Model Run-1

Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	1325	.000	0		
Independence model	50	20742.763	1275	.000	16.269

Table (6-16 b) FMIN for Model Run-1

Model	FMIN	F0	LO 90	HI 90
Saturated model	.000	.000	.000	.000
Independence model	33.242	31.198	30.456	31.951

Table (6-16 c) RMSEA for Model Run-1

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	0.156	0.155	0.158	.000

6.7.5.2 Model Run-2

Model run-2 is the modification of model run-1 which is still positive one way KM-OC proposed model, where the direction starts from KM to each one of the four prevalent organisational development practices (OE, OL, OI and OC) and then from each of the three intermediary practices (OE, OL, and OI) towards OC, however the model is shortened on the best suitable indicators as per EFA results. Model run 2 is reflected in Figure (6-2).

Tables (6-16 a) to (6-16c) reflect the increment and absolute fit index of model run-2 in figure (6-2) to see the goodness of fit. As per Chi-square ($\chi 2$) (16190.459) the evaluated model is with 820 degrees of freedom and has a corresponding p-value of 0.000; which evaluates the observed variance is distant to covariance matrix thus the model is not fit. The relationship between the Chi square value and the number of degrees of freedom does not satisfy the assumed criterion (19.744 > 2.0) which indicates the quality of the model is not

fit. Additionally the RMSEA is 0 .173, is higher than the 0.1 cut-off indicating a poor fit (Byrne, 2011). Therefore, the main model could not show a good fit.

Figure (6-2) Model Run-2 (KM-Organisational Development Practices-OC), after reduction of indicators of (KM-Organisational Development Practices-OC).

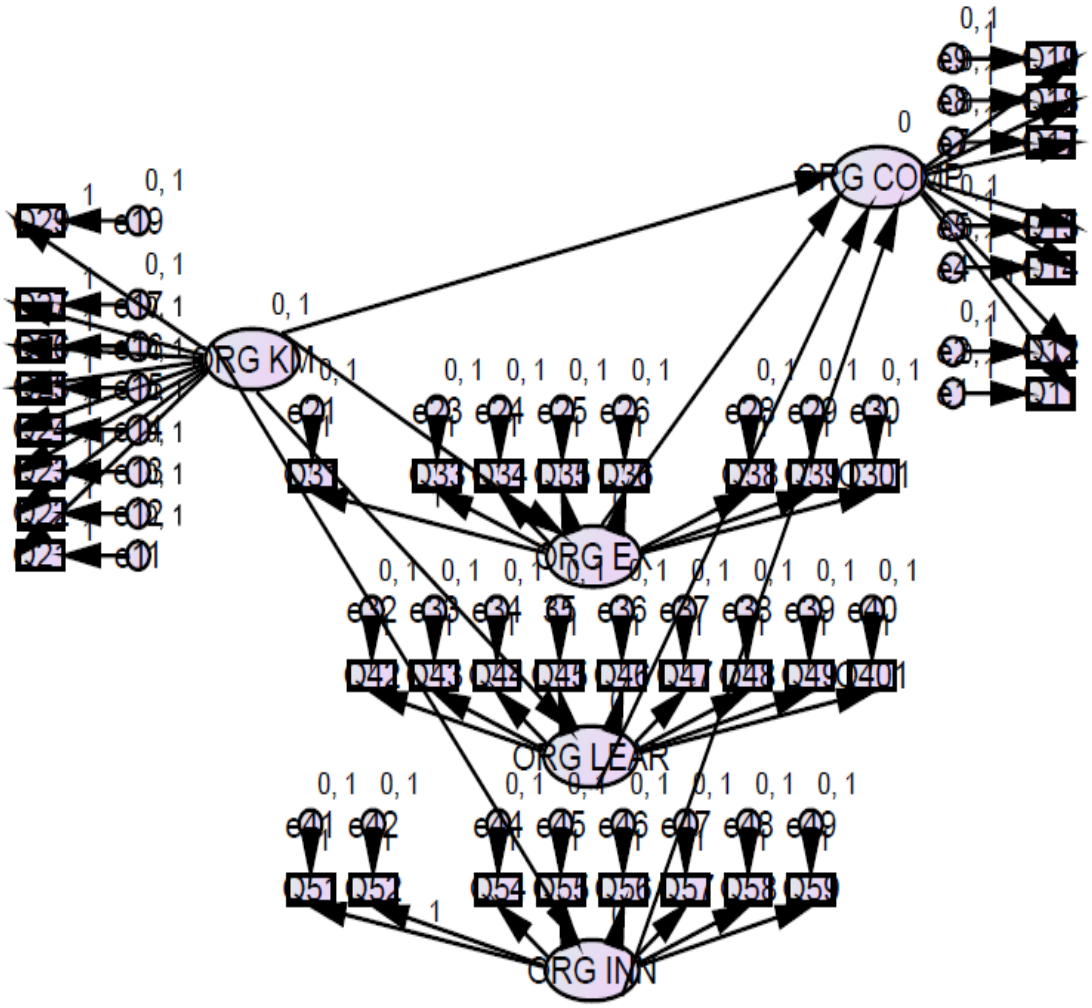


Table (6-17 a) CMIN for Model Run-2

Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	860	.000	0		
Independence model	40	16190.459	820	.000	19.744

Table (6-17 b) FMIN for Model Run-2

Model	FMIN	F0	LO 90	HI 90
Saturated model	.000	.000	.000	.000
Independence model	25.946	24.632	23.975	25.300

Table (6-17 c) RMSEA for Model Run-2

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	0.173	0.171	0.176	.000

Model run-1 and replicate model with extraction of specific indicators namely Model run-2, were planned to assist the holistic relation from Knowledge Management towards Organisational Competitiveness either directly or indirectly through specific prevalent organisation practices. Testing the model fitness using different parameters in CFA including for example non fit index NFI or CMIN, or FMIN or RMSEA conclude that hypothesised model run-1 or even its modified replicate with extracted indicators are unsuitable yet. Following Model run-3 and Model run-4 represent the minimum expected relation in the proposed conceptual model that represent the positive direction from KM towards each of the four prevalent organisational practices including OC.

6.7.5.3 Model Run-3

The third model as in Figure (6-3) is model run-3, which is the basis for positive one way KM to the four prevalent organisational development practices (OE, OL, OI and OC) and without any direction from these prevalent variables towards OC. This model is put in different back ground colour to show that this not the final proposed model and that its one of the alternatives for seeing the possibilities of the model fit, but not the best one. Both increment and absolute fit index of model run-3 in figure (6-3) were done to see the goodness of fit model. As per Chi-square ($\chi 2$) (13530.555) the evaluated model is with 1226 degrees of freedom and has a corresponding p-value of 0.000; which evaluates that the observed variance is distant to covariance matrix thus the model is not fit. The relationship between the Chi square value and the number of degrees of freedom does not satisfy the assumed criterion (11.036 > 2.0) which indicates the quality of the model is not fit. Additionally the RMSEA is 0 .156, is higher than the 0.1 cut-off indicating a poor fit (Byrne, 2011). Therefore, the main model could not show a good fit. Table (6-17) represent the RMSEA value for model run-3.

Figure (6-3) Model run-3 with the KM arrows flowing one direction towards the four prevalent variables.

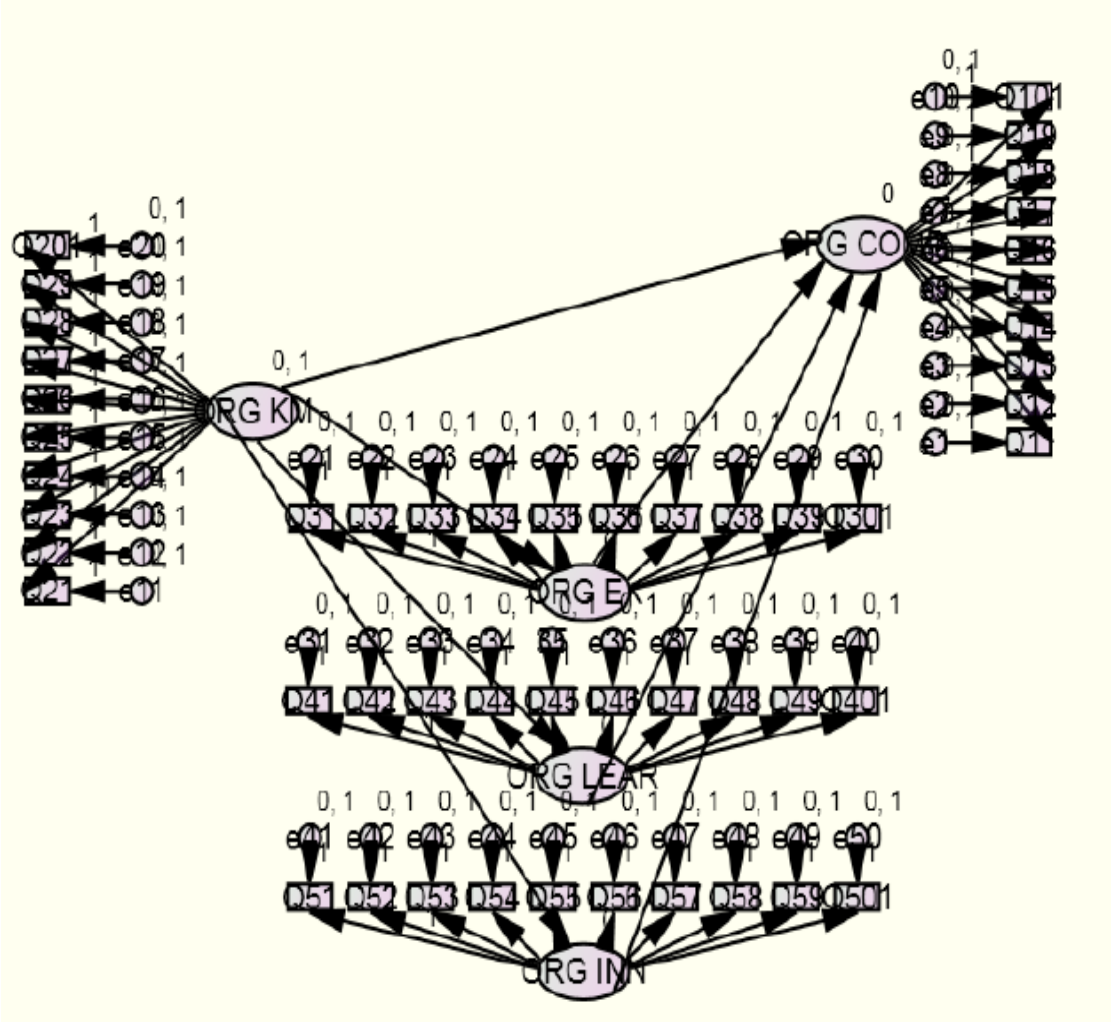


Table (6-18) **represents the RMSEA for Model Run-3**

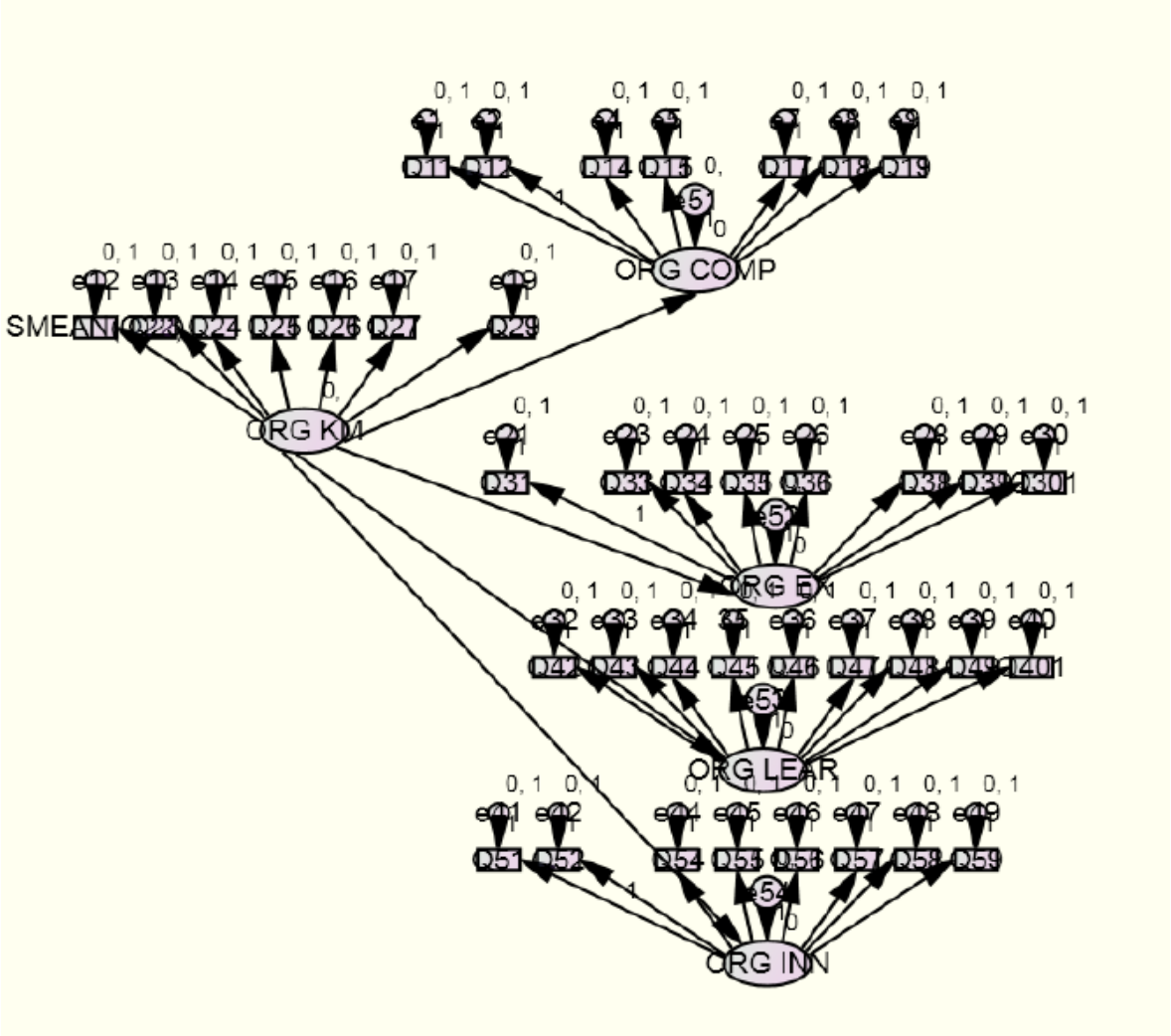
Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	0.156	0.155	0.158	0.000

6.7.5.4 Model Run-4

In order to give more chances to test the model fit, the model run-4 shown in Figure (6-4) was carried using a reduction of some of the indicators from model run-3, using EFA results, in order to see the model fit with less data reduction. This model is put in different back ground colour to show that this not the final proposed model and that its one of the

alternatives for seeing the possibilities of the model fit, but not the best one. As per Table (6-17) model run-3 shows the value of the RMSEA to be still more than 0.05 the required fit target which indicate the problem in the model fit in relation to the degrees of freedom.

Figure (6-4) Model Run-4 with KM arrows flowing one direction towards the four prevalent variables, after reduction of indicators.



The saturated model in model run-4 after CPA with 819 parameters and the independence model with 39 parameters and a discrepancy of 15820.236. Therefore the Chi-square ($\chi 2$) of evaluated model is with 1172 degrees of freedom and has a corresponding p-value of 0.000; which evaluates that the observed variance is distant to covariance matrix thus the

model is not fit. The relationship between the Chi square value (10782.687) and the number of degrees of freedom does not satisfy the assumed criterion (9.200 > 2.0) which indicates the quality of the model is not fit. Again RMSEA (0.158) in model run-4, as per Table (6-20) was found to be greater than the specified cut-off point at 0.06 and higher than what Schumacker and Lomax (2004) recommended to be less than or equal to 0.05 ,which similarly show that this model is not accepted.

From all above presented models tested, the main framework model which was called model run-1 and following three models show differences in non-fit however all are above the required cut-off point that would accept the model fit. The researcher moreover carried out a final check, model run-5 which showed an influence of each of the five variables on each other (i.e. two arrows model drawing). Again the model showed a non fit. *At this point the researcher decided not try any more model modifications, thus avoiding forcing the model for being fit.* The model run-5 results are explained in more details in Appendix (15). To evaluate the comparative fit of the model, the fit of the hypothesized model was evaluated to the null model (i.e., covariance = 0). All the models runs-1, 2, 3 and 4 were based on the *second research question (RQ2)* where the hypotheses of this research would be one direction represents the positive KM influence where KM would take the role of exogenous variable while the rest of the prevalent variables (OE, OL, OI and OC) would be indigenous. Although the model run-5 seemed to be out of the scope of the research it represented a possibility for future research on the basis of the model suggested and based on the literature review.

Table (6-19) **RMSEA for Model Run-4**

Model-Run-3	RMSEA	LO 90	HI 90	PCLOSE
Independence model	0.158	0.156	0.160	0.000

The comparative fit was carried with other tests and RMSEA shown in appendix (15) as the Normed Fit Index (NFI), which again ranges from 0 – 1 or as recommended by Thompson (2004) to be NFI≥0.95. Both TLI and CFI of all the model runs 1 till 4 show ranges below 0.9 which reflects the models proposed is not accepted again to be of a good fit.

Model run-3 and its replicate model with extraction of specific indicators (Model run-4) that were planned to assist the relation from Knowledge Management towards each of the four prevalent organisational development practices either directly or indirectly through specific prevalent organisation practices. Testing the model fitness using different parameters in CFA including for example non fit index NFI or CMIN, or FMIN or RMSEA conclude that hypothesised model run-3 or its modified replicate with extracted indicators are still unsuitable.

6.7.5.5 Parsimony-Adjusted Measures for model generalisation

One of the goals of scientific research is to get is generalised. Parsimony test gives solution that the results of the research are more likely to be true and are therefore typically more generalizable; the parsimony ratio must be taken into consideration when interpreting the data. This statistic takes into consideration the number of parameters estimated in the model, the fewer the number of parameters necessary to specify the model, the more parsimonious is the model. By multiplying the parsimony ratio by a fit statistic an index of the overall efficacy of the model, explaining the covariance among the variables and the parsimony of the proposed model is obtained (Gillaspy, 1996). The PRATIO represented in Appendix (15) for all the four model runs are very high in this CFA indicating that this model can be later generalized.

Besides all the model fit indices, the CFI for the tested Model run-1 was zero and Model run-3 was 0.368. Another comparative fit was carried with Tucker-Lewis Index (TLI), usually interpreted within the range of 0 – 1.0. Where it is recommended that TLI≥ 0.95 (Hu and Bentler, 1999), the TLI for the tested Model run-1 was again zero and for Model run-3 was 0.343. Therefore, it can be derived that in the case of the proposed model runs none of these measures near the minimum threshold.

6.7.5. 6 Discussion on the fitness of the Model

As per the previous sections of 6.7.6 Appendix (15), CFA and SEM tests were run with the five different model modification (called model runs) proposed while trying to establish the model fitness with different loading. The different model runs helped to carry out adjustments of the model relation directions. Model run-1 and Model run-3 were re-tested after deleting specific indicators based on literature review and the model analysis. Modification indices were used to determine which variables must be removed from the model. Since the degrees of freedom (df) are a function of the number of covariances provided and the number of paths specified, having a statistically significant model suggests, as discussed earlier in section 6.7.6, that the specified path models do not provide a perfect fit to the data (Neuman, 2003). The chi-square ($\chi 2$) is found to be sensitive to the sample size, since it is rare to find a non-significant value when sample size is over 500 cases. Hence, a final model was run for a sample size of 500 out of 625 samples received, but still the model run did not provide a good fit. At this stage, the researcher chose not to develop a data driven model. The research will focus on model run 1 and 3 that restrain the relations from KM to each of the four prevalent practices or extend it more from them towards OC, as per literature reviewed which addresses both the *second and the third research objectives.* The status of the non fit model should trigger a series of future research recommendations which should help to address also the *third research objective* in which these specifically to be discussed in both Chapters Seven and Eight.

The results of the regression analysis and SEM tests gave the researcher more confidence that reaching a stable KM-OC model is a more complicated task. The complicity of the proposed model can be due to possibility of not being able to measure certain important variable(s).This should help trigger the need for future studies.

6.8 Conclusions

In this chapter, the survey was analysed in order to answer and evaluate the *three main research objectives* which were proposed in Chapter One and represented again in Chapter Three. The researcher managed to collect a good sample of 625 participants out of 800 targeted sample sizes of the top and middle management officials, due to the efforts and

follow-up of the coordinators whom used e-mail reminders to encourage participation on behalf of the researcher supporting the *second research objective.* The descriptive statistics show the propositions derived from literature review about the KM status and its relation with OE, OL, OI and OC. Elements were correlated with the observed status and reported in detail. The results shows there is a good awareness about the importance of the four different organisational development practices/concepts covered in this research and their role to attain competitiveness which addresses again the *second research objective.* However, the research did not consider ways to achieve or sustain these practices since it is not part of the research scope.

Regression analysis shows significance hypotheses differences in the presence of KM compared to the other four organisational developments practices. The main estimates results show internal consistency reliability through Cronbach's alpha being 96.9 % reliable, i.e. the proportion at which the variance is found to be systematic or consistent. The five model runs showed that the Chi-square ($\chi 2$) statistics and the main SEM findings did not have a goodness of fit and hence the SEM indices does not show a close observed variance-covariance matrix to the estimated matrix which addresses partly the query of the *third research objective.* The estimates of the regression equation confirmed the four hypotheses that proposed the positive influence of KM on the four prevalent organizational development practices, also SEM showed positive results except for the relation of KM with Organizational Learning. After five model runs for the proposed research framework it was not possible to achieve a fit model with generalized results, hence the proposed holistic model a poor-fit. Core findings have emerged and were presented within this chapter that lay the foundation for discussion in Chapter Seven.

Chapter Seven – Discussion of Findings

7.0 Introduction

In previous chapter, the surveys responses results were presented as per the *analysis plan.* In this chapter findings related to the *research questions* and *research gaps* are shown with reference to the framework extracted from the literature review. The interpretation is referenced against the hypotheses and points of significance to the study highlighted along their implications. Furthermore, the results from previous chapter are discussed for their suitability to be generalised based on the validity of the current research studies on the subject. Moreover research issues are summarised and outlined with reference to the *study objectives.*

Based on the findings presented, an argument is established about KM's ability to establish a holistic influence on all four prevalent organisational development practices mentioned in the proposed framework. Development of the different organisational practices considered for this study is discussed with relevance to the context of governmental organisations. The chapter is systematically organised where the first three sections address the *three research objectives* set at the beginning of the journey; while the fourth section reflects the three previous sections in relevance to the main gap of this study (the holistic integrative approach). The fifth section prior to the conclusions present recommendations for future research based on the discussions.

The sub-Sections of 7.1 discuss findings relevant to establishment of the conceptual framework, including the specificity of the relations in the context of government organisation, together with the role played by KM in creating organisational development practices and competitiveness. Next, Section 7.2 discusses findings raised from addressing the *second objective* relevant to testing the conceptual framework in the context of government organisations. How KM holistically contribute to the organisation development practices was reviewed in Section 7.3, followed by the final proposed model of a fully integrated and holistic KM influence in Section 7.4. The chapter concludes with a specific

recommendation for continuing the research in the subject area in Section 7.5 followed by a summary conclusion from overall finding in Section 7.6.

7.1 Addressing the issues of establishing conceptual framework

The study's *first objective* was to discuss the development results of the initial conceptual framework that examine the relationships between knowledge management practices and organisational excellence, organisational learning, organisational innovation and organisational competitiveness based on examination of the literature. The proposed framework can be used as *a decision-making tool* that supports the gradual integration of the different concepts under one initiative. The process of developing conceptual framework in the context of government organizations, directed the researcher to first establish a clear understanding of the KM practices suitability which started with a *screening survey* as discussed in Chapter Four. Even though screening survey were carried out as part of preparatory linear regression and were not presented in detail being irrelevant to direct research questions, this survey supported the confidence in the suitability of the literature reviewed in other context and its relevance to the study area (Kingdom of Bahrain). Much of the results reported in Chapter Six suggest restructuring the evaluation framework to allow decision-makers appreciate each of the concepts as an initiative itself, then address the possibility of its integration. The following sub-sections further discuss the *first objective* and moved towards the *second objective*, while illustrating the role of each studied concept that KM and the prevalent organisational development practice.

7.1.1 Understanding the Government Organisation Status in the presence of KM

The impact of organisational status on the KM practices has been discussed in detail in different research starting from the work of Nonaka and Takeuchi (1995). The literature review revealed that organizations can be influenced by KM practices. This study would lead to an organisational development practices as excellence, learning, innovation and competitiveness. The study considers the *first research objective* through initially understanding the organisational status readiness in creating the necessary KM influence, as its main scope along all the prevalent practices in one framework (Storey and Kahn,

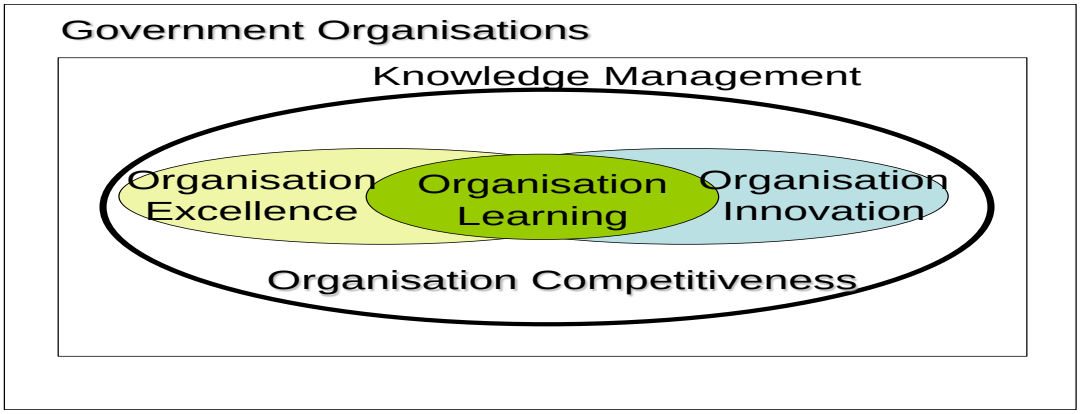
2010; Chen and Haung, 2009; Zack et al., 2009; Yang, 2008; Boumarafi and Jabnoun, 2008). However, to avoid any misunderstanding of the research results, the researcher address the survey second section and cross-checking the results of the third section.

Prior to setting the conceptual framework, *main challenges facing the proper implementation of KM in GO* was reviewed through literature. The study literature review activities and survey confirmed that *KM influence starting from knowledge sharing practices and the management of day to day knowledge need to be better managed to meet the expected demands in the knowledge economy* and found comparable with other recent research (Heisig, 2009; Rhodes et al., 2008). Further, another challenge was the *length of time needed to retrieve knowledge* where one third of the GO's believe that *KM is still not well utilised* (Buheji and Al-Zayer; 2010; Chawla and Joshi, 2010; Storey and Kahn, 2010). The early stages of the framework building found the overall means for constructs of KM, OL and OI to be similar, while the overall mean for OE and OC was slightly higher. Similarly the standard deviation as shown in table (6-10) in Chapter Six was found to be in the same range for KM, OL and OI in comparison to the ranges for OE and OC. This similarity can be justified by the extensive use and focus of the terms OE and OC specifically in GO's organisations in the past few years, further due to the ***government of Bahrain 2030 vision*** focusing on organisational competitiveness as one of its values.

To further understand the significance of KM influence framework on the GO's, the survey was designed to target the top and middle management of public officials as its population frame. The framework covered different types of influences that would support GO's competitiveness, especially in turbulent economy, even though it didn't specifically address knowledge economy (Gore, 1996). After understanding the importance of KM role in GO's, the researcher came up with more structured relation between the scope of the study, the research objectives relevant to the context and the prevalent organisational development practices repeatedly published in the KM research in the last decade which is illustrated in Figure (7-1) and further detailed in Table (2-2) of Chapter Two.

The *status screening questionnaire* carried out in the research early stage helped set ground for the research progress further based on the gradual development status of the GO's. The influence of KM on the four prevalent organisational development practices were identified by the literature review further appreciating the concepts suitability to the GO's. The researcher noticed through the critical review of the scales used in literature that there are quite overlap of the concepts which need to be taken care for before launching a survey that would try to measure the responses on all of them at the same time. Figure (7-1) reflects this integration and overlap seen in literature. Therefore, steps were taken to fine tune the framework and clearly emphasises on the independent and dependent variables, furthermore. The respondent level of understanding of these concepts at the screening survey helped to perform the main survey with clearer scales.

Figure (7-001) the scope of research framework shows the prevalent organisational development practices in the presence of KM and in the context of GO's.



The GO's managers demographics from the initial screening survey helped understand the gender type, age, positions and wide span of specialities that need to be considered when analysing the main KM-OC survey as part of the *second research objective.* The breadth and type of scales were further refined after this screening survey since more than half of the targeted respondents were found to be from essential service organisations like education, health and security, while the others were involved in infrastructure related services, government rights protection and innovation driven service department as per the statistics of the Civil Service in Bahrain. The details of the context alerted the researcher to

the need for a novel scale relevant to KM and OC to be considered with careful selection of wording to measure the constructs targeted. Furthermore, literature review points out KM initiatives to be studied if the framework is well established (Boumarafi and Jabnoun, 2008). Descriptive analysis shows that status of (age) influence on how organisational development practices are perceived. For example, the age groups (< 25 years old) and (> 50years old) were found to be above the mean and they perceived their organisational development in implementation of KM practices to be of more advanced status. This may be due to the young aged GO's manager (< 25 years old), mostly not at senior positions and who may be more enthusiastic about their organisations. Ultimately some of these justifications might be applied to (> 50 years old) managers, who may not be involved in the day to day activities.

Another understanding of GO's at the time of studying KM influence come from the central tendency as seen in Chapter Five, presenting KM perceived to play a major role in creating learning organisation practices. The participants were from various backgrounds ranging from teachers, medical staff, engineers, administrative staff, security officials, economist, lawyers, etc which represented a unique management supporting the survey outcome. The organisation status of the functional responsibilities of the research respondents are coming from different sectors and specialities in GO's.

The organisational status, part two of the survey, showed very few of the survey respondents have accepted their *organisation would be considered mature in KM implementation.* However, in the survey, more than three fourth of the respondents see their *organisation considering knowledge as the main asset.* This indicates *KM is getting importance in the government organizations environment which supports the possibility of a holistic KM influence framework* on the four prevalent organisational development variables that would support the *third objective* of this study. One quarter of the respondents believed *the main challenge is in proper knowledge sharing practices*, while other important challenges raised were *the inability of these organisations to manage the huge amount of information, the scarcity of information shared and the loss of tacit knowledge due to high employee turnover* which supported previous research (Rivera et al., 2009; Lundvall and Nielsen, 2007; Basadur and Gelade, 2006).

The other indicator that reflected the GO status before measuring the five main concepts in the survey was *the length of time required to get knowledge related material*. The *time for knowledge retrieval* differed from person to person, where 30% believed that knowledge related material could be retrieved within hours, while 20% believed they could get the *information within minutes*. In the extreme, 23.5% of the participant felt it *would take them few days to get the necessary information* while 19% believed that it *would require few weeks*. About one third of the participants believed their *organisation values are established based on knowledge sharing*, reflecting the importance of having value based scales relevant to the organisational development practices.

7.1.2 Development of KM influences framework towards prevalent organisational development practices.

The development of the research conceptual framework required determining the role played by KM in creating competitiveness, particularly in government organizations. More than 100 publications of the last ten years specifically were reviewed to see the type of influence, stimulation, impact and facilitation created by KM to develop organisational practices. The most prevalent, repeatedly studied KM influenced development practices were selected to be the constructs of this study framework. The work of Rhodes et al. (2008), Morales et al. (2007), Yang (2007) specifically inspired the author about the importance of the *KM Influence* as a consistent process that lead to behavioural change of the organisation (directly or indirectly).

In the area of study where the context was tested, the Bahraini government plays a major role in both public and industrial sectors, thus the competitiveness of each government organisation is very crucial for the country's growth (Al-Alawi et al., 2007). This may apply to lots of other governments as well (Wiig, 2002). Therefore, testing the proposed conceptual framework helps support the work established in the literature about *KM being one of the pillars on which organizational development practices rests* and has direct influence on the same (Harrington and Voehl, 2006).

The findings showed that each of the four prevalent organisational development practices are more influenced by KM in the Bahrain context compared to similar influence found by different researchers in other context and with less synergistic models where the relation of the three practices OE, OL, OI are less prevalent with KM and OC. The correlations carried on framework bi-relations between each two prevalent practices was found to be much higher with KM than the relations with OC directly, which further support other recent studies in the field (Yang, 2008; Scarbrough, 2003; Lahti et al., 2002). Furthermore, setting of the proposed framework influences organisational innovation through opening up new possibilities of work processes and creative environment that would encourage and promote competitiveness. Hence, KM influence as per the proposed framework would help government organisations to enhance its services and develop customer relationships leading to better image portfolio and sustained organisational competitiveness (Mohamed et al., 2009; Neely et al., 2006). The following sections would discuss how each of the five organisational development practice plays a role in the context of study.

7.1.3 KM Development within Governmental Organisations

The main KM-OC survey, as part of fulfilling the requirements of the *second objectives* had a set of questions targeted to measure KM status as per the proposed conceptual framework and the measures suitable for KM practices. Up to 55% of the respondents agreed that top and middle management appreciates *the market value of human capital knowledge;* hence indicating that such KM practices could influence particular excellence, learning and innovation practices. However, only a small number of this study's participants saw that their organisation had *clearly defined KM strategies.* This indicates that the GO's management are aware of human capital knowledge and acknowledge what their organisation may lack in proper structure in terms of KM strategies (Hsu, 2008).

The organisational development practices were found to contribute to the presence of OC. Results of correlation show that KM might be the best first starting point towards organisational development initiatives before reaching the OC. However, the results of the second part of the survey showed less than one third of the participants believe their

organisation has *listed all knowledge assets inventory*, but *haven't fully developed the ability to acquire knowledge while modifying their behaviours.*

7.1.4 Organisational Competitiveness Development within Governmental Organisations

This section addresses part of the *first research objectives* in understanding KM contribution towards the development of organisational competitiveness (OC) practices in the context of the governmental organisations. The aspects of organisational competitiveness were grouped into internal and external indicators. The external factors of the GO's competitiveness in the framework were driven by the fact that more than half of the total organisations have *future plans towards sustainability of services and obtaining analytical capabilities* which integrates with other recent research (Mohamed et al., 2009). The GO's competitiveness as per the survey results require to be further refined as results show that decision makers don't appear to fully understand the deep meaning of competitiveness. For example, from the survey, up to 50% of the GO's were found to have *established better ways of handling clients* even though they still agree that they *had not established high quality products and/ or services in terms of cost and speed of delivery.* Thus overall, the results show that even though the GO's had started certain OC practices, yet the theme of competitiveness is not fully reached (Adams and Lamont, 2003; Carneiro, 2000).

7.1.5 Organisational Excellence Development within Governmental Organisations

This section supports addressing part of the *first objective,* by discussing findings related to how KM may contribute towards the development of organisational excellence (OE) practices which was considered one of the main five concepts of the research framework. The conceptual framework specifically examined the relationship between KM-OE and reviews the organisations belief in *establishing plans to facilitate adaptation to change and progress towards accomplishing strategic objectives* where KM-OC survey showed it to influence organisational competitiveness. This should give importance to the practice of *ensuring GO's employees know their customers and organisation's objectives.* KM-OE

relation, being part of the framework, supports *GO's continuously improving their operations with effective communication between all levels of management.* Overall, the results show OE initiatives are more dependent on KM as part of the organisational efforts to reach competitiveness.

7.1.6 Organisational Learning Development within Governmental Organisations.

This section address part of the *first objective* discussing findings related to KM contribution towards the development of organisational learning (OL) practices. The empirical test of the relations showed a positive correlation between KM-OL which support the research reviewed and thus having a synergy between KM and OL (Hafeez and Abdelmeguid, 2010; Liao and Wu, 2009; Ho 2008; Chinowsky and Carrillo 2007; Loermans, 2002). The result of OL as a set of practices have shown that GO's *employees feel freer to speak their minds on what is learned* and hence this would reflect on the *ability of the organisation to communicate effectively*. Furthermore the relationship between KM-OL in the set framework raised the possibility of the senior and middle management appreciating their *organisations being open for more learning*. Further, the results of the OL analysis show that for an organisation to start to *turn its mistakes into constructive learning; minimisation of repeated mistakes and staff involvement in certain decisions* would help KM practices to occur. Essentially, this can explain why most participants believe that their GO's *encourages multiple viewpoints and opens productive debates that lead to building organisational ability to breaking old work style and patterns,* and hence move towards organisational innovation practices (Weerawardena et al., 2006). The inability of the GO's to benefit from *the "lessons learned" sessions* does not help promote *knowledge sharing experiences* as shown in Section 6.6. The detailed correlations tables shows that most GO's started to adapt OL practices where *human capital learning is considered to be more of an investment rather than it being an expense.* Furthermore, as the study reveals OL practices seems to be at its' early stage since GO's *lack proper programs that close skill gaps and improves proficiency.*

7.1.7 Organisational Innovation Development within Governmental Organisations.

The final part of the KM-OC survey focused on understanding the proposed KM contribution towards the development of organisational innovation (OI) practices in the context of GO's. The discussion of this practice helps to address part of the *first and second research objectives.*

The results of the survey and the outcome of the literature review support the view that GO's can have better organisational development practices on presence of a *supportive culture that is willing to share information and practice team work.* This happens due to *allowing transfer of best practices that lead to new developments,* with a *gradual teamwork participation in the daily work.* This study reported that GO's *accept creative ideas from achievements and failures*; however there is still a *need to develop social networks that support the innovative capabilities and help establish clear innovation.* This process has facilitated setting a conceptual framework that included knowledge management influence on government organisation innovation. The survey results further showed participants believe that *people would be rewarded on their innovation through a mechanism that bring out their potentials,* based on *products and services that are brought on a yearly basis.*

7.2 Testing the conceptual framework in the government organisations

The *second objective* was to empirically test the conceptual framework in the context of government organisations where Kingdom of Bahrain was chosen to be the base of this study due to ease of access and the possibility to attain a good survey response. The KM-OC survey was designed to determine which of the organisational development variables from OE, OL, and OI are influenced by KM, and then influence OC. The study help to understand the positive KM influence on the organisational development practices specifically OE, OL, OI and OC in the GOs.

Thus, the *aim* of this research was to investigate the KM influence and its potential within the organization, which other researchers had started, but based on holistic approach (Heisig, 2009). The descriptive statistics helped to describe the main features of the data

collected quantitatively by the survey. Descriptive statistics or inductive statistics claim to summarise a data rather than use the data to learn about a sample or population that the data are thought to represent, this would mean descriptive statistics unlike inferential statistics are not developed on the basis of probability. For example, on this basis it is used to report the overall sample sizes, sample sizes in sub-groups (examples according to positions), and demographic variables such as gender and age. Descriptive statistics uses distribution, central tendencies and dispersion which show that the holistic approach supports both the academic and practical needs of KM journey (Heisig, 2009). The t-test for the independent samples examined the difference between the GO's participating in the study relevant to their response to the proposed organisational development dimensions. One-way ANOVA was used to examine the difference between three or more groups. The inferential analysis showed the means of KM, OE, OL, OI and OC to have a noticeable difference, highlighting that organisations do not give equal importance to the five variables. Further, the analysis revealed that 54 different government organisations gave importance to a different and not the same aspect in all cases. The four hypotheses established at the beginning of the research proposing the direction of relationship among KM and the other four organisational development variables were addressed from the point of fulfilling the *first research question.* Data collected on the variables were put into multiple regressions and test of the model significance was carried out. In order to validate the model assumptions various tests, such as tests of linearity, homoscedasticity, normality and multicollinearity were applied. Testing the significance of the coefficients in the regression analysis helped the researcher to address the four hypotheses mentioned earlier in Chapter Three related to the nature of relationship between KM and the other four constructs OE, OL, OI and OC, which will be addressed below.

The *first hypothesis* establishes that there is a relationship between KM and OC. For this purpose, all the survey indicators measuring KM and OC were put through the regression model. All the beta coefficients were significant in the regression model. Hence KM positive influence on OC was established. The output from regression analysis confirmed the hypothesized relationship between KM and OC. This implies that if KM is more utilised in the GO's then the organisation competitiveness will improve, where

competitiveness is the key practice that an organisation can obtain and continuously improve.

The *second hypothesis* showed a relationship of KM practices and OE which was confirmed by significantly high correlation results, thus showing the role that KM can play in meeting *best service delivery* as part of organizations strive to impede excellence processes. Moreover, the lowest correlated coefficient existed between OE-OC was (0.049) in relation to *implementing KM Policies to improve its service delivery thus ensuring a return on investment.* This should assist the GO's to focus on *service delivery* as a priority area for the competitiveness in KE. OE indicators were put through the regression analysis and found to be positively associated, furthermore the beta coefficients for the KM-OE model were found to be positive. The output from the regression analysis confirmed the hypothesized relationship between KM and OE, thus it can be assumed that an increase in organisations KM would lead to an increase in the organisational excellence.

The *third hypothesis* created by the researcher for this study addresses KM positive influence on OL, which is an important relation for integration towards organisational competitiveness which is still discussed in most recent research (Maden, 2012; Lee et al., 2012). The survey had a set of questions (indicators) measuring GOs top and middle management response towards organisational learning practices. Regression was applied on these indicators to examine whether KM and OL have a positive relation. The beta coefficients of the KM-OL model were found to be significantly positive. Thus the regression analysis output confirmed the hypothesized relationship between KM and OL.

The *fourth hypothesis* related to the *second research objective* was to investigate whether KM has a positive influence on OI (i.e., is organisational innovation practices influenced by KM). The regression analysis revealed that a positive relation exists between KM and OI since the beta coefficients were positive. The output from regression analysis confirmed the hypothesized relationship between KM and OI which supports the work of (Jiang and Li 2009). Thus, in case of OI an organisation needs to enhance its KM practices in order to innovate.

The framework studied establishes one path among different possibilities where the organisation can reach competitiveness through organisational excellence. Relationship between these and the mediating element was clearly reported in the correlation, regression and structural equation modelling which support the recent work of (Hung et al 2010). This suggests a need for a model that represents the main stages of *organisation growth and phase expected to pass through during their attempt to improve its processes and ultimately business performance.* This proposed model emphasis that most OC benefits occur when the balance between all the four main variables is in synergy. Such model need to be studied in future research with more or less variables to ensure it is statistically fit. Having wider base of studied variables would ensure that gaps on the model are identified and filled for a rigorous multivariate analysis. Compared to the published literature work explored research between KM and OC and the four prevalent organisational development practices; this study has shown the highest correlations between all potential prevalent variables (KM-OE, KM-OL, KM-OI, KM-OC, OE-OC, OL-OI, OL-OC, OI-OC) © (Hung et al., 2010; Yang, 2008; Rhodes et al., 2008; Jiménez and Navarro, 2007; Morales et al., 2007; Lin, 2007; Akgu¨n et al., 2007; Weerawardena et al., 2006; Thornhill, 2006; Chang and Ahn ,2005; Calantone et al., 2002). The model runs developed in the fourth stage of the study came based on the most established relationship among the variables. Table (7-1) shows the comparison between the construct correlations in the main literature, showing all potential relations closely related with statistical significance as per the scale and context of the study.

Population comprised of 625 top and middle management from 54 government organisations from the management-level reflect the importance of this research emphasising on decision makers awareness in relevance to KM practices (Gold et al., 2001). Therefore, and as part of the *second research objective* it can be confirmed that the population of this research is comparable to research of main reference © and specifically those in Table (7-1) which are from top and middle management from industrial and private sector based organisations. Almost all research referred to in Table (7-1) were carried out in the context of one country; i.e. in countries as USA, China, Taiwan, Turkey

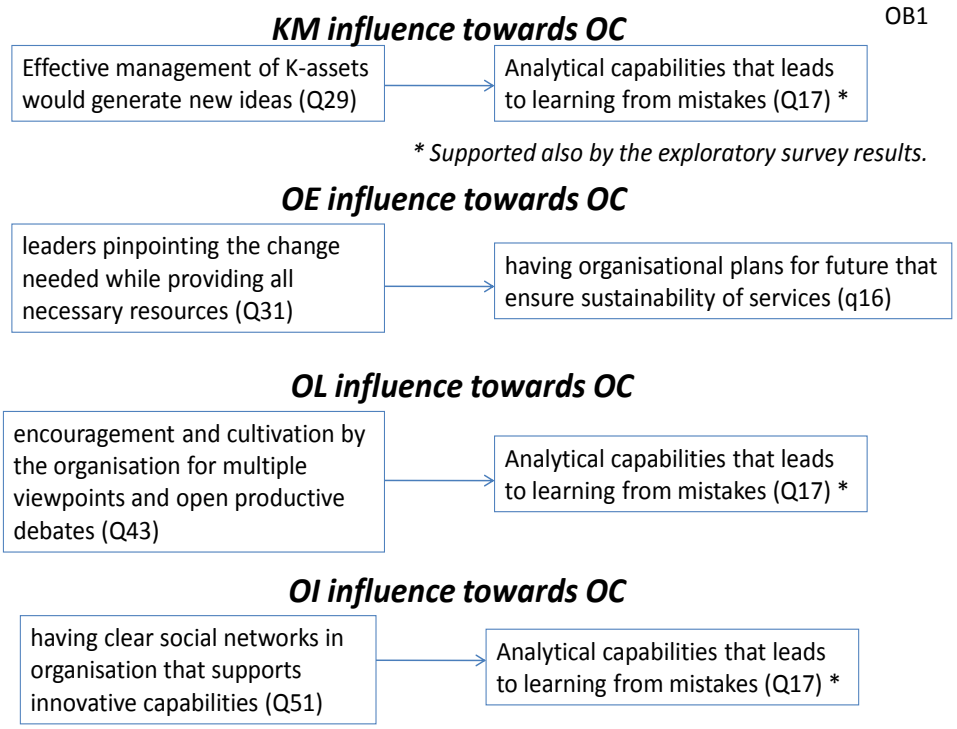
and Spain. Table (7-1) shows difference in the results of published literature which are mostly on private sector. The justification for the different result in correlation might be that the private sector seems to be more particular and aware of the difference between each of the five variables or concepts KM, OE, OL, OI and OC. Therefore it is important to have practical initiatives that would enhance the understanding of these concepts as viewed, and the themes of development and implementation reflected in the literature over the one decade. The research survey measured the different practices and their interdependence that seemed important to any GO.

Table (7-1) Comparison between relations of five main construct correlations as per the framework

Table 1	Published Literature	This research
KM-OE	0.38 (Hung et al., 2010); 0.52 (Zheng et al., 2010); 0.20 (Yang, 2008).	0.80
KM-OL	0.32 (Jiménez and Navarro, 2007); 0.11 (Chang and Ahn, 2005)	0.75
KM-OI	0.39 (Vaccaro et al., 2010); 0.44 (Rhodes et al. , 2008) ; 0.29 *(*Chang and Lee, 2008) 0.37 (Akgun et al.,2007) ; 0.33 (Jiménez and Navarro,2007); 0.39 (Lin, 2007); 0.07 (Thornhill, 2006); 0.10 (Chang and Ahn ,2005); 0.36 (Calantone et al. ,2002)	0.78
KM-OC	0.67 (Mills and Smith,2011); 0.30 (Akgun et al., 2007); 0.45 (Calantone et al. ,2002)	0.77
OE-OC	0.51 (Storey and Kahn, 2010);	0.76
OL-OI	0.56 (Morales et al., 2007); 0.15 (Weerawardena et al., 2006)	0.68
OL-OC	0.36 (Storey and Kahn, 2010)	0.68
OI-OC	0.55 (Storey and Kahn, 2010); 0.54 (Akgu¨n et al. ,2007) ; 0.495 (Morales et al. ,2007)	0.71

Relevant to the *second objective*, the study shows specific outcomes relations between the most correlated indicators of organisational development prevalent practices, including KM, on one side and the organisational competitiveness on the other end, as reflected in Figure (7-2). The relations figure (7-2) is established based on the correlations results which reflect presence of certain practices within the prevalent main four concepts that reflect towards organisational competitiveness.

Figure (7-2) Specific Variables relations that shows type Infleunce on the Organisation Competitiveness from all prevalnet organisational development practices in this study.



As part of addressing the holistic influence studied in the *third research objective*, it is observed from Figure (7-2) that government organisations need to target *the analytical capabilities that are based on the organisational ability to learn from mistakes*, based on the presence of the relation of KM, OL and OI practices that lead to the organisation development. Moreover, the holistic influence of KM in GO's shows that practices such as *knowledge assets management, open dialogues and social networking*, pushes the organisation towards one of the most influential OC practices. The results show certain agreement with a recent study that GO's need special practices in the *leadership ability to create change in order to move towards proper sustainable planning for services* (Mohamed et al., 2009).

7.3 Understanding KM holistic contribution to the organisation development practices

Previous studies on KM influence have been fragmented as they only consider some aspects of this influence rather than using a holistic view of the KM influence capability. The literature review shows a gap where one to two KM influence relations are available in most of the publications in the past decade. This section discusses how this study addresses the *third research objective;* providing an understanding of how KM holistically contribute to the organisation development practices that comprises the dimensions of organisational excellence, learning, innovation and competitiveness, in the context of government organisations. This is supported by the growing tendency to take a more 'joined-up approach' across all types of social science research that help researchers address the research problem (Zikmund, 2003). This research scope was narrowed to focus on KM initiatives in GO's environment where it targets to develop better organisational competitiveness by studying dependence of the variables on each other. Being holistic, this research promotes a concern with the relationships between different concepts, rather than with single problem or concept (Bagozzi, 1980).

Holistic approach is not new in business models, what is new is the application of this approach in the discipline of KM. The holistic view in this study is seen as the complex and dynamic characteristics of KM influence and its interaction towards organizational competitiveness. As presented earlier in Figure (7-2); the different objectives testing clarify the potential of a holistic influence that is caused by the presence of KM influence as the starting point which would trigger other practices directly and lead to organisation competitiveness practices as learning from *mistakes due to analytical capabilities* as in question (Q17) of KM-OC survey. Understanding the possibility of this KM holistic relation with the other organisational development practices raise different questions on type of constructs and dimension that need to be covered to satisfy these relations. To establish proper understanding of KM holistic influence on the various variables of OE, OL, OI and OC; the *first research question* was developed with the purpose to explore KM overall influence on the mentioned prevalent organisational development practices. *The study shifts the current research paradigm from addressing individual relations mainly, to the creation of an overall framework that promotes the importance of the holistic influence*

of certain organisational development practices towards organisational competitiveness starting from KM initiatives.

In order to meet this holistic understanding, the researcher used the survey as tool to measure the influence of KM on the specified four organisational development practices. The central tendencies (the mean), variability's and dispersions (standard deviations and ranges) as studied in table (6-10) showing that the relations between the five organisational development practices i.e. KM, OE, OL, OI and OC to be quite effective on GOs. To gain further broad overview of the KM practice measures in the study; the frequency counts and percentages were computed for the current KM practice in the GO's. The KM-OC survey results shows that GO's have the minimum proper understanding of the concept of KM and they consider knowledge as a main asset to a level that most of these organisations are seen to be in the middle stages of KM implementation. In sum, currently the subject of KM seems to enhance the possibility of the holistic influence where KM have influence on all the prevalent organisational development practices one time, in the same model or same initiative, thus addressing the *third research objective.*

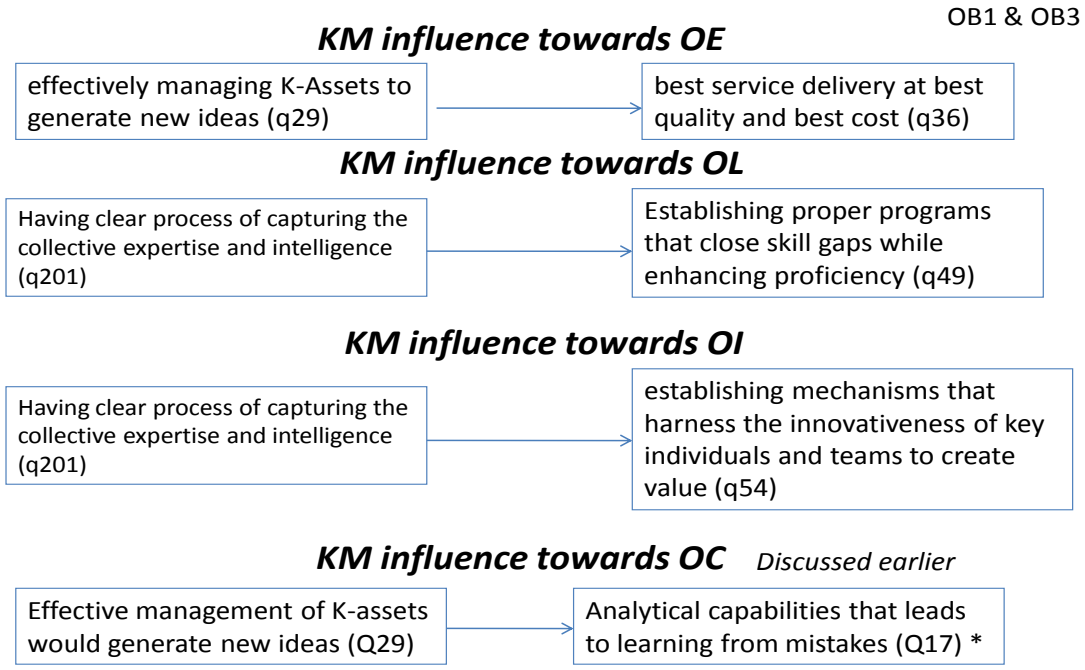
The *second research question (RQ2)* supports the *third objective* in its attempt to answer and address the exact type of relation between the five organisational development variables (KM, OE, OL, OI and OC) that can lead towards holistic influence. The relation between KM and each organisational development was tested by Cronbach alpha and cross-correlation for reliability and validity testing as a preparatory step before answering *RQ2*. Pearson's statistical index, Spearman correlation coefficient, simple and multiple regressions were used for hypothesis testing to describe the degree of strength and the direction of relationship between the constructs. From the Cronbach alpha the data reliability was established with the scales values being above 0.60 which implied that the measures used in the survey are reliable. The Pearson's correlation coefficient along with regression were used again for hypothesis testing to address the *research second and third objective* and to see the association among KM, OL, OI, OE and OC constructs. Furthermore the issue of holistic approach and which variable gets influenced by KM on the other variables was still not clarified. For this purpose, the researcher used the Gaski

approach by Pearson correlation along with Spearman's correlation coefficient to allow further comparison. The analysis of data provided interesting and decisive direction for the research which showed a positive correlation among OE-OC, OI-OC, KM-OC and OL-OC. Furthermore, as established earlier with hypotheses OL-KM, OE-KM and OI-KM were also seen to have a positive correlation (Appendix (8)). The correlation existed between KM-OE was found to be the strongest which indicates that from all other constructs KM influences OE is the most. Another significant finding from the Pearson correlation was the factor affecting OC the most, found that OE influenced OC the most from KM, OI and OL, therefore setting a path between KM, OE and OC. According to Hung et al. (2010) the first condition examining mediating effects is that the independent variable and proposed mediator must each be significantly related to the dependent variable when considered separately. This study analysis demonstrated that the independent variable (KM) independent of the proposed mediator (OE) and both were significantly related to the dependent variable separately. The second condition Hung et al. (2010) focused on requires the independent variable to be significantly related to the proposed mediator. The analysis in Chapter Six demonstrated how the independent variable (KM) significantly related to the proposed mediator (OE). Although KM is positively associated with OC (as indicated by Hypothesis 1), the relationship between OE and OC was as less strong. This result supports that OE mediates between KM and OC.

The relations in figure (7-4) are established based on the correlations results which reflect the influence of KM practices on the four prevalent concepts. From these relations it is now clearer that GO's need to *effectively manage knowledge assets to generate new ideas*, as observed in Figure (7-4), with strong influence on creating OE and OC practices. That is to say that through *effective management of knowledge assets* the organisation can both ensure lean services (at best quality, best cost and best delivery) and ensures enhancement of OC practice relevant to analytical capabilities. *While managing to have knowledge capturing practices, starting from utilising the expertise,* would both manage to establish proper programs that close skill gaps and be able to establish innovative programs that creates value in relevance to OI. Therefore, concluded in Figure (7-4) that practices in management

of knowledge assets and knowledge capturing need to be established in KM government initiative.

Figure (7-3) Specific Variables relations that shows type Knowledge Management Infleunce on all the prevalnet organisational development variables in this study.



In addressing holistic contribution of KM, as set in the *third research objective*, a confirmatory factor analysis (CFA) using structural equation modelling (SEM) was used to ensure the source and type of variables that cause the influence towards organisational competitiveness. Testing and estimating the causal relations in the model was done using a combination of statistical data and qualitative causal assumptions with purpose to test the theory testing and development (Bagozzi, 1980). As the relationship among various variables was established, next the researcher was able to create suitable model following

five model runs to address the *third research objective.* The model run details are discussed in Section 6.7.5.

7.3.1 Understanding and comparing Model fit.

In the quest for fulfilling the *third objective* understanding KM holistic contribution to the organisation development practices; the researcher addressed the model fitness, where different model runs were proposed, with second run being on KM influence on OC, OL, OI and OE set together as per the research objectives. The first and third model runs, single pointed arrows from KM to the four prevalent organisational development practices and from the rest of three practices of OE, OL and OI towards OC indicate causal effects. For the purpose of validating the model initially CFA was examined to determine the underlying variables and then the path analysis was analyzed for relationships that might be found among the five variables. Through pre-factorization, primary component analysis (PCA) helped produce the proper decision on variables needed to be dropped to come up with the most suitable detailed model. The second and fourth model runs were done after carrying out the PCA where 11 variables were removed. However, on analysing the model runs for fitness it was found out that all of them are non-fit. Certain missing variables or additional variables might need to be removed or included in order to come up with a holistic model that confirms the influence of KM on all organisational developments practices towards OC. Eventually the researcher choose not to force the model and accept the results as further attempts might defies the purpose of testing the holistic model with these practices. One of the justifications for the non fit model is the weaknesses in knowledge sharing practices seen as per the results of Section Two of the survey where the scarcity of information shared, feeling for huge information to be managed and the ability to retrieve information takes few days to reflect the status of maturity where the model is tested. This gives feedback that as far as the *second research objective* is concerned the context of GO's might not be ready to create enough influence to meet the proposed holistic influence in the conceptual framework, since issues relevant to infrastructure, training, trust and/or culture still affect the influence on KM itself.

To meet the *third objective* again, the relationships between KM and OE, KM and OL and KM and OI were studied to see how they would lead to GO's competitiveness. These relations were addressed by: OE= ∫ (KM), OI= ∫ (KM), OL= ∫ (KM) and OC= ∫ (KM). As per the main references used in the literature review (Storey and Kahn, 2010; Chen and Haung, 2009; Zack et al., 2009; Rhodes et al., 2008; Yang, 2008 ; Law and Ngai, 2008) it was found that the relations between any of the main variables (KM-OE, KM-OL, KM-OI, KM-OC) were approximately similar for this study. Furthermore, it was found that the published R^2 as per Table (7-2) shows to be in the range 0.56 to 0.64 and significant at $p< 0.05$. The results of R^2 suggest that up to 64% of the KM influence variance on the organisational development practices are explained by the four variables (OE, OL, OI and OC).

To meet the *first objective* an initial conceptual model is developed to examine the relationships between all the organisational development practices and KM. The following four models were introduced and tested:

$$OE = \int (KM, OC, OI, OL),\ R^2 = 0.791 \qquad (1)$$

$$OI = \int (KM, OE, OC, OL),\ R^2 = 0.781 \qquad (2)$$

$$OL = \int (KM, OC, OE, OI),\ R^2 = 0.768 \qquad (3)$$

$$OC = \int (KM, OE, OI, OL),\ R^2 = 0.650 \qquad (4)$$

Since the fourth model captures the proposed holistic framework depicting the progression from KM to OC, the researcher decided to examine the model relationships more thoroughly.

The fourth holistic model expresses OC= ∫ (KM, OE, OI, OL) generated a higher $R^2 = 0.65$, indicating that a proposed holistic framework is stronger than the other proposed models involving simple regression as presented in Appendix (11). Table of (7-1) reflects the importance of KM as a factor of influence. The work of Yang (2007) in GO's shows a comparable R^2 in the KM-OE relation with this study, where the R^2 represents the amount of variation in the dependent variable which is explained by the model. Thus the holistic model explains 65% of the variation in the dependent suggesting that there might be an area

of improvement worth to be investigated to account for the 35% unexplained variation which could be due to missing variables or interaction among the variables which was not explored.

Table (7-2) **Comparison between the study and literature in regression results (R^2) for KM influence with each of the organisational development practices.**

Relations	This research	Storey1 and Kahn 2010	Chen and Haung 2009	Rhodes et al. 2008	*Yang 2008	Law and Ngai 2008	Chang and Lee 2008	Jensen et al 2007	Morales et al. 2007	Yang 2007
KM-OE	0.64	0.48			0.63					
KM-OL	0.56								0.87	0.80
KM-OI	0.60	0.37	0.58	0.19			0.23	0.17	0.56	
KM-OC	0.58	0.41				0.50			0.65	

All the beta coefficients in the holistic model are found to be significant. A holistic effect on KM (0.65) which can be explained due to KE understanding and governmental organisations situations. The result of this study ($R^2 = 0.65$) compares favourably with the different literature R^2 reported in Table (7-2).

7.3.2 Understanding the link between GO's development and KM practices.

In addressing the *third research objective*; KM practices are found to enable organisations to develop new capabilities, enhance existing services and improve overall organisational processes. This understanding of KM influence and mechanism would address the *three objectives* started for this research. The researcher studied the organisation status ability in ensuring the success of KM initiatives and its relation to KM practices through analysing sections one and two of the KM-OC survey. By overcoming specific challenges that were reflected from the second section of the survey helped to establish better link between the level of organisational status and KM influence which supported the literature in line with

this study (Chawla and Joshi, 2010; Chan and Liebowitz, 2006; Blackwell and Gamble, 2001).

The research finds the literature supporting that KM initiatives and maturity are linked to organisational development setting, where the study shows the ability of knowledge transfer help organisations increase its ability to acquire, convert, apply, and produce KM practices (Lin, 2007; Lahti et al., 2002; Alavi and Leidner, 2001). Human networks role, i.e. team work, deep dialogue, etc., covered in this research should help further trigger the practice of knowledge sharing (Lin, 2007; McDermott and O'Dell, 2001). This study however goes further into analysing the KM initiatives on the operational level to business value that would sustain competitiveness (De Souza, 2006). Mapping these KM practices components can enhance the rate of innovation, business agility and operational performance which later help optimise organisation capacity. This research is argued to be of importance for those striving to measure the KM and KE readiness as OECD and (KMi) frameworks discussed in Chapter Two. Thus it is thought that if organizational development status and not only its practices are taken into consideration; the results of the relation between KM influence and organisational development practices can be generalised for all GO's worldwide regardless of their geographical difference, country civilization and economy. Such integration between KM and other organisational development practices are relevant towards effective implementation of principles no matter what is the current government standing and current economy (Dimitriades, 2005; Goh, 2002; Gupta et al., 2000).

7.3.3 The importance of KM path based framework developed in GO's context

In this project journey, the researcher emphasised on the importance of the path framework to reflect on the role of KM as organisational mechanism that integrates different disciplines together towards OC as per the *third research objective.* Knowledge with a high level of idiosyncrasy is found to be valued more in the context in which it was developed (Teece et al., 1997; Bagozzi, 1980). Hence, being organisation-specific, knowledge can trigger particular organisational mode of functioning, its particular organisational context,

or particular organisational development practice or status as a sort of organisational glue, which again fulfils the *third research objective* requirements (Andreu et al., 2008).

In order for specific organisational context to reinforce the inimitability; path-dependent framework was reproduced based on the combination of KM within the particular setting of GO's specificity earlier discussed in literature review. It is clearly projected in this research the lack in the body of knowledge that maps the KM influence in GO's specifically and in a holistic approach leading to OC (Choo et al., 2007; Diakoulakis et al., 2004; Carneiro, 2000). Due to research limitations and feasibility of studying more than five constructs and concepts; *KM influence on culture* as another main construct was controlled, however was qualified to be only as part from the main questions and not a complete dimension of the research survey scope. The conceptual framework tested was based on a path model that draw positive relation from KM to every organisational development separately; i.e. KM-OE, KM-OL, KM-OI and then directly from KM-OC. The framework shown in Figure (3-1) meant to show KM as the source influencing factor to all the four organisational development practices in the context of GO's.

Tables (7-1) and (7-2) show the correlation and R^2 consequently, as part of the *second research objective* emphasising that KM influence on OE is the most important relation and path towards organisational competitiveness as against KM-OC, KM-OL and KM-OI. This was supported by OE influencing OC the most, in comparison to the rest of the variables, i.e. KM-OC, OL-OC and OI-OC. This result should draw the attention that GO's should focus more on KM since doing so will have a maximum influence on OE and in turn OE, and will have the highest positive influence in creating OC practices. This empirical study emphasises acknowledging the *value of human capital knowledge* in the GO's in working towards improving its practice. The survey shows that both *tacit knowledge utilisation* and *knowledge sharing* triggers the KM influence on OE before establishing organisational competitiveness. The findings give importance to knowledge capturing and its relevance to the GO's success especially if it starts from the internal expert contribution. KM thus is found to have diverse benefits for all types of GO's management participated in the survey, which support earlier research where managers within organisations are seen to be able to

determine what information is relevant to specific situations thus adapt proper knowledge into their organisation (Waddell and Stewart, 2008).

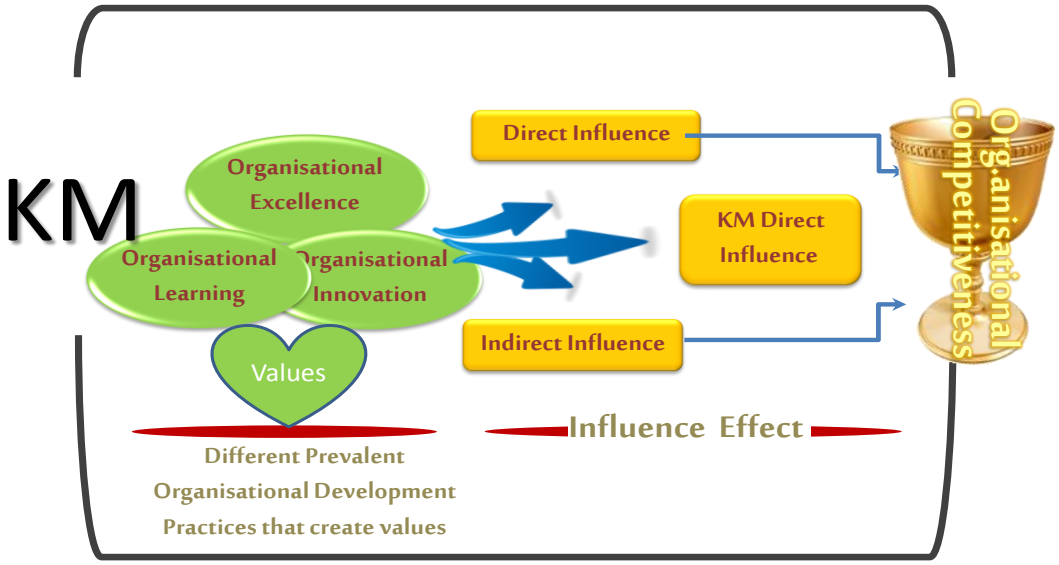
7.4 Towards a fully integrated holistic KM influence Model

The work in this research takes a different approach, through cross-disciplinary perspective which focuses specifically on KM influence as an organised, systematic attempt of processes or practices that are relevant to creating, acquiring, capturing, sharing and using knowledge (Phillips and Pugh, 1994). To achieve the *third objective and the second research question*, this research brings along appropriate integration of different enhancement of excellence performance, learning and innovation organisational practices leading to competitiveness through KM practices leading to proposed holistic effect (Jiménez and Navarro, 2007). Even though certain studies have been carried out holistically from the point of the influence of OL on OI and OC (Akgun et al., 2007); the holistic approach of KM influence, as presented in this study, had limited attempts in literature of the past one decade (Zheng, 2010; Zhang, 2008; Diakoulakis et al., 2004; Morales et al., 2007; Diakoulakis et al. 2004; Carneiro, 2000). With the development of knowledge revolution we are practically living in today, the body of knowledge still needs more attempts for holistic approaches based on empirical work that clearly links the top prevalent organizational development, henceforth the work of this study setting starts from KM as compared to models where KM is only a mediator towards competitiveness © (Zheng et al., 2010). In this complex business world, flexible and dynamic tools are needed to deal with the consistent evolving complexities. Thus literature should have different tools of how KM initiatives would increase the abilities of the organisation therefore lead to its development and competitiveness (Diakoulakis et al, 2004). The four prevalent organisational development practices from recent literature were tested by a five-point Likert scale and hence was used for the main KM-OC survey (Zack et al., 2009; Liu and Cheng, 2009; Nguyen et al., 2008; Waddell and Stewart, 2008; Salleh and Ahmad, 2008). In complement to this study, recent studies showed that improving KM practices would surely enhance both the operational and organizational performance (Fugate et al., 2009, Chen and Haung, 2009).

In order for the KM practices to be holistically incorporated, integrated and synergised into different organisational development initiatives, the context of study need to be fully understood as per earlier studies propositions (Goh, 2002). Therefore, a proposition as per the results of this study was set to suggest a model based on the results of Tables (7-1) and (7-2) which shows the results of correlation and regression analysis compared to the best recent referred paper of reference. Particularly, from Table (7-1) it can be said that the strength of correlation between KM and each of the four prevalent organisational development practices are more than the strength between these practices and OC. This suggests that it is better that these practices first get attached to KM and then progressively move towards OC as reflected in proposed model of Figure (7-5). Here the dependent variables are OE, OL, OI and OC; however OC is more dependent on all of them. The proposed Figure (7-5) is an emphasis that Figure (3-2) explored in this study establishes that KM, OE, OL and OI have positive influence on OC which help address the lack of the current body of knowledge in business viability, competitiveness and growth that KM initiatives establishes in government organisations; besides the challenges faced in bringing in model fit framework (Diakoulakis et al., 2004).

The proposed framework further addresses the lack of relation between theory and practice that explains the synergy created by KM with OC on or with the various organisational development approaches through which the characteristics of holistic integration would hold the fragmented initiatives together and address the recent academic attempts towards creating organisational competitiveness in presence of KM initiatives (Yang et al., 2009). The recent suggestions put forward by Chawla and Joshi (2011) of having a linkage between KM and OL initiatives in order to enhance the organisational outcome supports this study proposed model. Therefore, it is important that organizations view this linkage as an ongoing performance improvement activity by focusing on the improvement areas as identifying in the findings of the study. It is also suggested to include the importance of these concepts in the long-term vision of organization and develop best practices around them.

Figure(7-4) Proposed holistic framework showing the progression from KM through any of prevalent relations before reaching OC.



By integrating the five organisation development elements defined and discussed in this research into the day-to-day practices, practitioners could simultaneously focus on present business needs. The final proposed framework in Figure (7-5) addresses the *third research objective* thus ensures that knowledge practices required can be examined systematically while influencing the other organisational development practices, thus give enough reflection of recent research in the field where it touch base on the importance of the systematic handling of knowledge during its creation, storing, sharing and applying (Heisig, 2009).

7.5 Continuation of KM influence research

The KM influence research seems to be of importance to many researchers in the field in the past one decade specially. Recent work of Lee et al. (2012) and Yusof et al. (2012) shows how KM influence on OE and OC is becoming richer, taking into consideration that prerequisites as culture, structure and infrastructure became of the norm of such research.

The ability of KM to lead to better performance through knowledge sharing influence coincides in both Akdere (2009) and Willem and Buelens (2007). This research have shown and proven the competitiveness would depend on the organisation knowledge practices and its relevant influence, Zhang (2008) and Wang et al. (2009). McElroy (1999) research, even though earlier, has focused on the alignment of KM influence with government directions that was later supported by (Zack, 1999) and (Cohen and Prusak, 1996). Hence, the holistic influence found in this research depends on the appropriateness of the KM program chosen which supports Robinson et al. (2006). However, this research fails to address what different authors believed of KM influence role towards know-how strategy implementation which create again a supportive environment for KM programs (Salleh and Ahmad, 2008; Lee and Choi, 2003; Yahya and Goh, 2002).

From above discussion, KM initiatives can be argued to be as a reform in optimising organisation internal resource that facilitates effective measurement thus pushing the organisation intellectual assets (tacit and explicit knowledge) to a greater productivity level adding value and increase organisation competitiveness (Harrington and Voehl, 2006; Tiwana, 2002). These focused KM initiatives surely would be of importance if taken as part of strategic plans.

If KM does indeed foster knowledge-based competitiveness, then there is a practice-oriented effort that should be undertaken. The analysis of the empirical work emphasis that GO's managers should be made more aware of types of KM practices potentially associated with existing theory thus predict when to use knowledge for the purpose of strengthening organisational competitive positioning. This type of logical thinking would help further develop a common understanding of how knowledge contributes toward organisational performance improvement and how much is this contribution (Change and Ahn, 2005).

With the importance of organisational competitiveness (OC) for GO's in the new emerging economy becoming greater than ever; new research has to develop meeting this dynamic demand in such a way that would be the base for internal resources utilisation (Kasim,. 2008; Halawi et al., 2005). It is now established that competitive practices based on

physical, financial, or even technological assets are less sustainable since these assets are becoming easier to access through markets that have became increasingly accessible worldwide (Gupta and McDaniel, 2002; Civi, 2000). Hence, this research supports (Andreu et al., 2008) efforts to develop idiosyncratic, ‘‘all your own’’ and "context-specific" knowledge that gives meaning to the organisation ways of doing things and helps building sustainable OC (Drucker, 1993). Thus the competitiveness that KM influence depends on a holistic approach that would address the culture, the organisational development practices, processes and technologies (Tseng, 2010; Migdadi, 2005). This combination significantly promotes KM initiatives to provide idiosyncratic knowledge that is difficult to imitate as a source of competitiveness which address the *third research objective*. However, this research tried to specify the type of KM practices to be particularly correlated to organisation-specific development practices through survey scales that were defined on what was studied, thus opening an area for future studies on GO’s KM internal resources.

7.6 Conclusions

A synopsis of the main findings allowed the researcher to relate the experiences learned in this project. One of the main learning extrapolated from empirical evidence that addresses the *first research objective* indicates that integration framework need careful selection of organisational development concepts and its indicators. The other research learning is that problem statement developed, as *RQ1* based on a cause and effect logic can be used when a relation between what are the possible causes for establishing competitiveness in GO’s in a knowledge economy (causes) and the variables that are expected to affect it as the (effect) which addresses partly the *second research objective*. However, the major motivation for this research would be the ability to address the lack of a holistic approach that could link the influence of KM on the organisational practice and which have set the *second and third research objectives*. KM influence on the organisation development practices start early in different stages until achievement of OC is clearly supported in this study. However, having R^2 to be as high as 0.62, without a clear holistic model fit raises an area of interest for a future research. This was clear after running the CFA / SEM as per the original

sample size and this shed a possibility for dropping or adding certain variable in future studies to improve the model fitness.

KM with Organisation development practices has stronger correlation than OC with the same prevalent practices. This means that KM can be a pre-requisite to OC and that KM can be a source or (first point) towards OC, developing one of the main contributions of this study and further support the *thesis title*. This study support other studies that go further to help organisations address sustained competitiveness through finding possibilities that enhance organisation's ability to develop rare and valuable knowledge that subsequently spread throughout the organisation which again address the *third research objective* (Bogner and Bansal, 2007). The research advocates that organisation-specific knowledge, i.e. GO's KM, play a fundamental source of an organisation dynamic capability which supports recent work on the subject (Andreu et al., 2008). The interpretation of the *third research objective* establishes that the role of KM practices such as the influence of knowledge transfer on OL and/or OI should continue if it is taken as part of the initiative design. Such way of thinking would be of importance depending on the context of implementation and the type of organisational sector, its KM maturity status and region needs (Rhodes et al., 2008; Syed-Ikhsan and Rowland, 2004).

KM dynamic relations discussed in this research as part of addressing *the second research objective* reflect the ability of the influenced organisation to develop, implement and maintain appropriate practices that are hard to copy. The survey results even argue that a well-structured KM influence would support the establishment of organisational competitiveness in GO’s through different path of organisational development practices. This study confirms that the investigated role of each of the main KM practices can be tested from the holistic model relations that describe KM initiatives and its critical success factors.

Chapter Eight – Conclusions and Future Research

8.0 Introduction

This chapter summarises the main findings, contributions and implications reflecting the outcome of all the previous chapters in accordance to the *three research objectives*. The findings of this study presented in Chapter Seven contributes to a better understanding of KM's influence towards GOs competitiveness through four organisational development practices: Organisational Excellence (OE), Organisational Learning (OL), Organisational Innovation (OI) and Organisational Competitiveness (OC). Section 8.1 provides an overview of research and findings, followed by Section 8.2 which is dedicated to discussing the research contribution to the body of knowledge. Section 8.3 presents the contribution of this research to previous research. While section 8.4 discusses the research implications, it is followed by section 8.5 which argues about the research limitation. Finally, this thesis concludes by section 8.6 which presents the proposed future research opportunities.

8.1 Research Overview and Findings

Governments around the world are challenged to deliver more innovative education, better healthcare, competitive infrastructure, and excellence oriented quality of life services; with sustained national resources expectations increasing every day. Having been used to continuous protection, GO's are facing difficulties in adapting to the rapid changes in its environment (Maden, 2012). Hence, with restricted government resources, better value for money and therefore better performance is expected from each government organisation. This is addressed through the *first objective* where the relation established between KM and each of the four organisational development practices help the research focus on tracing the influence of managing knowledge, which bring in the most hidden value within government organisation (Chang and Ahn 2005). As the competitiveness of an organisation as per Prusak (1997) depends on what the organisation knows, how it uses what it knows and how fast it can know something new, this research sheds better understanding on how KM practices if well utilised through integrating it with other practices would lead to better governmental organisation deliverables. This research fills a gap for the absence of an

overall understanding of KM frameworks that been address in recent literature and how it glues the different relations together (Ho, 2008).

Taking into consideration the *three research objectives*, the outcome of this research seeks to address the possibility of government organizations competitiveness if KM initiatives are well managed and clearly reflected its role towards various organisational development initiatives. Since the European Institute of Public Administration (EIPC, 2003) recognises government organisations as the most knowledge intensive organizations, GO's are expected even to play a significant role in activating countries role optimising its use of internal resources in the knowledge economy (Chawla and Joshi, 2010).

KM in this research is referred to as the practice by which *organisations generate value from their intellectual capital and knowledge based assets*. The *first research objective* addressed relations between KM and OE, or OL, or IO, or OC addressed based on synthesis from the literature where KM influence framework creates value towards an organisational competitiveness directly or indirectly. The results of the *first objective* emphasises that KM as an initiative can establish organisational internal values and resources that lead towards being more competitive. Organisations today are able to access knowledge through different ways and at any time, however this research emphasis on the fact that what is becoming more important is managing knowledge based on values and knowing how it can be used to create the sustained competitiveness (Mohamed et al., 2009; Liao and Wu, 2009).

Therefore, KM influence in this study had pointed vital issues that would help organisational adaptation against the radical discontinuous environmental change that GO's are facing. However, the research did not cover specific changes in the government competitive environment which might lead to increased recognition of KM practices and GO’s way to improve their effectiveness and performance in delivering government services with specific KM practices. Understanding the pre-requisites around the government competitive environment explains the integrated aspects of KM performance and its relevant relationships on organizational outcomes, thus strengthening the holistic

influence, i.e. two way arrow model, which was mentioned by recent researches (Lee et al., 2012). Hence the researcher focused on the term organisational competitiveness (OC) that represent an advantage from implementing a value creating initiative, such as KM, that would help organizations use internal resources and capabilities towards sustained competitive outcomes. The success of showing the importance of such initiatives, can boost government organisation ability to consistently maintain a status and characteristics above average for its industry and which cannot be easily copied, supporting (Yuen 2007) recommendations for developing the GO's ability to understand and apply KM. The results of (KM-OC) survey can help link the organisational status and the impact on the KM influence on the GO's competitiveness (Gimenez and Rincon, 2003).

This research supports efforts towards establishing a successful measurement framework for KM initiatives besides the well known KMi World Bank and Economic Forum tool discussed in Chapter Two (World Bank, 2010). The research findings bridged the gaps found in literature on the lack of awareness about KM with organisational competitiveness in the public sector in general and in government organizations specifically (Phusavat et al., 2010). The novel scales of the KM-OC survey developed for the *second research objective* used for this study add value to the different KM tools available today as it addresses all potential concepts that can be measured relevant to KM initiative and specifically in government sector. This addresses what the prominent KM scholars Davenport and Prusak (2000) recommended for ensuring that KM practices scales need to fit the organizational context when addressing the organisational competitiveness issue. This work should help minimise limitations and open potential opportunities for effective management of knowledge since it focuses on practices and behaviours rather than just systems and procedures. The implementation of such practice based concepts and themes through indirectly defining the cause and effect for successful KM initiatives, as part of addressing *the first research objective*, should help produce better organizations and more importantly better governments (Riege and Lindsay, 2006).

In accordance with the results of the KM-OC survey conducted in this research as part of *the second research objective*, GO's were found to acknowledge the importance of

knowing, moreover were aware on importance of being in a position to utilize such knowledge to the maximum to support enhancing organisations ability to compete in knowledge economy. The results of the survey emphasise that GO's understand the power of proper KM practices as management of knowledge assets. However, the results show that decision makers within GO's need to understand the link that the power of knowledge assets does enable taking proper actions towards competitiveness. The investigation of KM practices as K-Assets, K-transfer and K-Capture are considered important part of this study, since it is linked to the *first and third objectives* where the relations of such KM practices with other organisational development practices were identified as per the literature and the extent of holistic integration between them were tested (Argote and Ingram, 2000). As mentioned in Chapter Two, section 2.4 as knowledge assets can be easily duplicated unless external knowledge is integrated with internal knowledge which leads to deliver organizational development practices that lead to better probability of innovation performance and organisational values (Phusavat et al., 2010). The relations with other dependent practices based on the KM holistic influence depend on the power initiated by such KM practices. This supports (Heisig 2009) emphasis on the important of descriptive type of framework that describe KM attributes and their influence on the success of certain initiatives. The originality of this work is that it produces a critical analysis of KM practices and its ability to reflect how an organisation would manage knowledge starting from the development of knowledge assets which are reflected in the organisational competitiveness. This finding supports the work of Lundvall and Nielsen (2007) understanding the importance of KM influence specifically when tacit knowledge becomes scarcer. The research result of Hsu (2008) showed how K-Assets when shared can facilitate better organizational performance environment, hence the importance of the finding. The research further emphasised the practice of knowledge sharing and transferring to build the organisation ability towards knowledge capturing, which, ultimately, can lead to organisational competitiveness (Hua et al., 2009).

The general findings reflect the importance of KM as a concept in this study and its role in minimising opportunity loss in the organisation through supporting the process of initiatives selection that are linked to organizational targeted practices, behaviours and

outcomes. Once the organisation optimises its initiatives, the value proposition and outcome would be more tangible and sustainable. The relation confirmed through KM practices on one side and any of the organisational development practices through significant, strong and positive correlation should help deliver better values to the organizations, which is an outcome that addresses the *second research objective* and support recent published work (Phusavat et al., 2010). This integrates with the earlier work where KM, organisational performance and OI are found to lead to *performance behaviours that deliver value to customers* (Rhodes et al., 2008 and Hertz, 2002). This pushes an argument whether values such as responsiveness, efficiency, productiveness and flexibility could have been more accurately measured as part of the organisational competitiveness. This reflection is illustrated partly in the framework represented in Figure (7-5) by the values of organisational excellence, learning, innovation and competitiveness, but more in Figure (8-1). This figure is complemented by other forms of values that KM might bring in the form of idiosyncrasy, return on investment, organizational development status, organizational practices and organizational maturity that different authors have recently proposed (Andreu et al., 2008). Furthermore the holistic approach as raised in the *third objective* of this research was found to be an important source of value generation that can ensure coordinating KM initiatives and identifying its relevant relationships. The integration of the different concepts in measureable outcome format complements major characteristics missing in the current KM models (Heisig, 2009). This would demand an environment with more collaborative tasks thus ensuring sustained organisational competitiveness as per recent studies in the field (Andreu et al., 2008; Yang, 2008; Chang and Ahn, 2005).

Coming back to the first part of this study *aim* towards ***investigating the influence of KM on three prevalent organisational development practices in a government setting and the influence on organisational competitiveness,*** results reveal that any of the prevalent organisational development practices can help organizations reach competitiveness either directly or through the influence of KM. As part of the *aim* of this study is to understand the *utilization of KM initiatives in governmental organization,* findings show a positive influence of KM on the remaining organisational development practices with a clear path

between KM to OC through OE where to establish such utilisation is more possible and most empirically recommended. The study started with an overview of the research problem identified in KM influences and existing gaps as well as its relationship with different organisational development practices that would lead towards OC. The scales of OE, OL, OI and OC were studied and specifically in the wide variety of GO's core of business. The special consideration of holistic perspective given to the context under study was meant to help harnessing the benefits of this research faster.

However, the comprehensive, holistic model established is based on the positive relation direction, path model and framework starting from KM towards the different concepts studied; showing its importance to the development of life necessity services in most participating organizations in the study.

The series of model runs helped ensure that all directions of influence between all main concepts were considered. Since regression R^2 and CFA parameters results could not show a model fit, the researcher confirms that the path towards organisational competitiveness need to be further studied to explore alternative paths other than from KM to OE. The researcher highly believes that the study could be replicated, as having the model not fit due to nature of context, due to limitation of data. Future studies are recommended to further investigate missing variables that would help achieve the holistic model proposed in reference to this study and other recent studies that proposed areas such as culture, structure, infrastructure and strategy to be the influencing source that would define the type of KM relations, (Handzic, 2011; Zheng, 2010). These missing variables can be explored more starting from this study Chapters Two and Five.

The *most important findings relevant to the research objectives* can be summarised as follows:

a) *KM is an essential factor in the government sector.* This is clearly shown in the literature reviewed and the value based propositions in papers, furthermore the descriptive analysis and the empirical correlation results reported in this research. This is relevant to the *first and second research objective.*

b) Four prevalent practices can lead to direct or indirect organisational competitiveness directly or indirectly. This is clearly illustrated from the psychometrics (the reliability and validity) and the propositions in papers, furthermore the descriptive statistics and empirical correlation. Thus KM can be a source for organisational competitiveness or a source for other organisational mediating practices towards competitiveness. *This addresses the second research objective.*

c) *Correlations and regression ratios* between the different prevalent variables are *comparable with the latest research* in the field and within the scope of KM influence research.

d) *Holistic model could be feasible showing the extent of KM influence* however this could be more supported if the model had statistical fit, which can be addressed through future study as part of *addressing third research objective* that focus on the potential missing variables in the proposed framework. This justifies the decision of the researchers' decision to avoid forcing the model fit in order to maintain the research reliability after testing different hypotheses by five models runs.

e) *The influence of KM found in government sector organizations found to be of the same when compare to publication on KM influence for private sectors.* These comparable results might help to convince several government decision maker to focus on the faster adoption of KM initiatives.

Based on the results of the KM-OC survey, carried out to measure the five variables indicators and relations where the KM practices seem to be a vehicle for change (Heisig, 2009; Zack et al., 2009). The published work supported the importance of developing KM initiatives as strategies that would lead towards government competitiveness. The *research objectives* facilitated the development of scales for the different variables and enhanced understanding the KM influence. The scope of this research covered in detail the influence type that KM practices can create once it is adopted within the organisation. The results were analysed in small groups based on the position, gender and age range in search for patterns from this study compared to other studies. Findings helped point out a possible design of a KM model for government organizations in general and the GCC region

(Boumarafi and Jabnoun, 2008; Al-Alawi et al., 2007; Al-Busaidi and Olfman, 2005). Therefore this research would be of specific interest for the different government development practice based initiatives in the six nations of the GCC countries—Bahrain, Kuwait, Qatar, Oman, Saudi Arabia, and the United Arab Emirates have a high per capita GDP and where the government of control of most economy drivers, (International Monetary Fund [IMF], 2010).

8.2 Research Contributions

The significance of any study is based on theoretical and practical contributions that address the objectives of the study. This section *makes reference to most important issues surrounding the results of this study investigation on the KM influence in government organizations.* This study explored and investigated the subject of KM and its influence towards the creation of organisation competitiveness and its specific benefits on the concepts of OE, OL and OI. The research addressed part of the gap found on KM influence literature by empirically examining how such influence holistically increases the influence of each organisational development explicit practices on organisational competitiveness.

Despite the above decade of extensive research into KM influence literature there is still a gap in literature in bringing in a comprehensive framework that links all prevalent organisational development practices with KM in one framework. The lack of adopting positive approaches relevant to the influence of KM implementation and getting its value in many organisations have been inspiring even to the latest researchers (Pinho et al., 2012). Therefore, the *main theoretical contribution in this study comes from understanding the linkages between KM and the four essential organisational development practices* that both researchers and organisations managers are increasingly pre-occupied with.

The framework proposed for this study helps close the gap reflected in the literature about determining whether KM adoption can glue and influence organisational excellence, innovation and learning and even move organizations towards greater competitiveness.

This supports latest research where KM infrastructures, knowledge process capabilities is thought to lead to better organizational learning, and organizational performance (Lee et al., 2012). Therefore the relations between all concepts of organisational development practices and its relevant initiatives in this study show the benefits gained from using only the internal resources within the organisation. Thus this research should help close the gap of adoption of a holistic KM initiative especially in government organizations which both Maden (2012) and Wiig (1997) believe it would lead to better organisational learning, human behaviours, capabilities, business philosophies, operations and practices. This is addressed through the following points which this study raised while making a link to recent publications:

a) *What happens when bringing different disciplines together in the presence of KM.* Lee et al. (2012)
b) *Strength of influence of KM extending beyond only one or two variables.* Salleh and Ahmad (2008).
c) *How organisational competitiveness is ensured through a holistic model that have the four organisational development variables.* Zheng et al (2010).
d) *The role of the specificity government sector in the KM holistic influence model.* Chawla and Joshi (2010)
e) *The role of all the prevalent development practices in creating a sustained organisational competitiveness.* Leonard-Barton (2008).
f) *The understanding that a holistic picture leads to when the practices integrates together.* Heisig (2009).

Therefore, this thesis provides a novel model towards the transformation of government organizations towards being more competitive. The hypothesising factors are found to be more critical in considering the moderating effects of KM influence addressed in the *second research objective.* Testing of the hypotheses revealed that KM positively and significantly influenced the GO's and enhanced its capability to be more competitive. The uniqueness of GO's, being the research context, does not limit the research findings from its applicability to other organisations especially that this research draws on existing KM models, literature and selected variables that are believed to be critical to the success of

KM in any organisation. The study specific contribution to government sector helps in approaching KM initiatives and measure its influence in creating and speeding-up certain organisational development practices relevant to KE. The suitability of the KM practices is challenged from the angle of its ability to create organisational competitiveness. The understanding that the survey scale show how KM practices help in facilitating and accelerating the diffusion of knowledge along with the different forms of organisational practices, gives a different interpretation to KM and its role towards human capital. Pinho et al. (2012) whom seen that having a holistic view that includes both human and technical factors would be in favour of the organisation. This should help minimise the gap between governmental and non-governmental KM research when it comes to utilising internal resources supporting latest studies on the importance of KM resources on organisational performance (Chuang, 2004).

Overall, this research emphasis how the competitiveness of government organisations can be developed through specific relations, starting from KM practices. The main instrument of this study called (KM-OC) survey was used to measure 625 decision makers from 54 government organizations offers a new tool to measure KM influences and specifically in the context of government organizations. *Therefore, it can be concluded that the main contributions of this study helps governmental sector in better understanding the KM discipline through helping facilitate the KM initiatives adoption and prioritise its practices. This contribution has within it the following four contribution points that this research came up with:*

a) *Holistic approach and KM practices influence* leads to *Value Added result, i.e.* Organisational Competitiveness.
b) *KM is important to Government Organizations and comparable* with it results to other sectors.
c) *Scale developed can be generalised* and used as *a self assessment tool for organisational practices in knowledge economy.*
d) *Baseline for KM initiatives and practices in Kingdom of Bahrain, GCC Governments and Middle East.*

e) *Support generalising previous and recent research* on the importance of KM on creating organisational competitiveness.

8.3 Contribution of this research to previous work

Further to both the main and practical contributions; this research comes as continuation of the work by many researchers in the field who paved the way for some of the principles being investigated in this project. The links between the established works and these research contributions are clearly illustrated in the discussion of Chapter Seven and have their roots in the literature review chapter. Similarly this work supports KM models of casual relationship framework proposed in same line as the literature reviewed (Heisig, 2009; Yang et al., 2009; Diakoulakis et al., 2004).

KM importance to government organizations have been known to lead to better and more efficient services, more empowerment, better ability for complex decision making, collaboration, development of overall performance, improvement of accountability and mitigation of risk (Butler et al., 2008; Riege and Lindsay, 2006). The demand to meet knowledge economy requirements as per almost all of GCC governments visions of future presents knowledge management initiative as challenge which this work specifically supports. The result of this research can help generalise Thornhill (2006) research where on KM been associated with increase of organisational changes that enables organisational competitiveness. This integrated understanding of both organisational development practices with knowledge practices capabilities pushes the GO's environment research to new area. Besides, this research more importantly addresses similar concerns that started the OECD (2003) KM survey which covered 20 countries and 132 departments, ministries, agencies and revealed the importance of practices on KM European public sector organizations. This research further supports (Yuen 2007) call for successful KM initiatives in the government organizations thus; this research supports possible comparison between the European region results and the GCC region in the area of KM and GO's competitiveness programs, even though this research was only on one country. The scales of KM-OC survey are made compatible so it can be easily expanded to other countries (Haslinda and Sarinah, 2009).

The holistic KM framework explored as per the *third research objective* provides useful assistance for planning, and implementation of initiatives that can promote harmonised understanding of the organisational development through the possibility of interdisciplinary experience. In a discipline, as KM, research and practice remain to be driven by the integration of different disciplines that is based on theoretical understanding and practical experiences (Lee et al., 2012; Heisig, 2009).

8.4 Research Implications

The competitive characteristics of this KM practices influence study adds both academic and practical implications that emphasis its uniqueness and originality. KM initiatives are considered a key strategic internal asset and a resource to almost all the important governmental oganisations (Cabrera and Cabrera, 2002). The research focused on an identified research gap that would help in effectively helping government organisations to be more competitive. This research has both academic and practical implications which are discussed as follows:

A) Academic Implications

The academic implications of this study can be summarised as follows:

1. Opens a new line in relevance to holistic research in Gov Organisations, KM and Competitiveness fields.
2. The research results urge government organisations to recognise KM holistic initiatives *as a vehicle* for success in creating better organisational development practices, i.e. better value. The proposed KM holistic model generates quantitatively better results and exhibits significant relations between KM and the organisational internal resources with four organisational development practices (Organisational Excellence, Organisational Learning, Organisational Innovation and Organisational Competitiveness). Thus this research gives the academic community a new study in KM holistic influence in creating competitive government organisations in KE.

3. The study shows the creation of a *path model and identification of factors that mediates the KM influence towards OC.* The research was able to generalise the latest research results where KM influence on OE was seen to be the most potential path that would lead to OC in governmental organizations, (Hung et al., 2010).
4. The study supports and extends the existing recent work that *targets better understanding of the knowledge practices in governmental organizations* (as management of knowledge assets, knowledge transfer and knowledge capture) and its importance as a valuable organisational internal resources (Harlow, 2008; Mohamed et al., 2008; Sung, 2006).
5. This study have been tested along with a *novel scale instrument* developed by the researcher for the *aim* of this study and used in small economies, which support the rare few studies in the field in the GCC region (Boumarafi and Jabnoun 2008, Al-Alawi et al. 2007). Similarly this study support other KM studies on the governmental organizations in large economies, as in Malaysia and Singapore (Yusof et al., 2012; Kumar and Rose, 2012; Goh 2008; Syed-Ikhsan and Rowland 2004). This gives the possibility for the research instruments to be compared and generalised for governments to help them better prepare for KE practices.

B) Practical Implications

This research *second and third objectives* offer practical contribution where the influence of KM on organisational development practices in this research helps practitioners determine the KM role in developing organisational performance and competitiveness (Heisig 2009). This provides further understanding of how the different aspects of organisational practices need to be addressed by practitioners holistically. Thus, the analysis of this study is of interest not only to policy makers, but also to managers in governmental organisations, since it highlights opportunities for improving current practices that influence organisations development.

As discussed in Chapter Two recent studies suggest that KM is not well linked with certain appropriate practices relevant to organisational development despite rapidly expanding KE (Lucas, 2010; Phusavat et al., 2010). As the outcome of the *first research objective* shows

little research that compare organisational developments practices initiatives which lead to organisational competitiveness; this study on KM initiative towards OC through (OE, OL and OI) is expected to raise both the practical and scientific dialogue to practitioners in the area of GO's starting from Bahrain, if published and deployed. As per (Lin and Lee 2006) KM practices describe the strategies and processes of acquiring, converting, applying, and protecting knowledge to improve a firm's competitiveness. This contribution enhances deep dialogue that would be surely of importance to GO's community in times of unstable economy, furthermore the study compliments the practical projects executed by different leading governments, including Bahrain, that established a KM strategy to meet knowledge economy demands (Alstete and Halpern, 2008; Knowledge-based Economy Strategic Master Plan of Malaysia, 2002). For example, this study would be an empirical support for the Singaporean Government KM initiative which encourages the experimentation among its government organisations through a program called the KM Experimentation Program (KMEP) that was conceptualized in July 2001 (Chua and Goh, 2008). Attempts to review influences of KM initiatives as taken in this study helps further understand how such concept helps in creating better governmental development. This study further suggests that KM initiatives need not be necessarily technology focused, but rather contextually aware and tied to the nature of these practices, such as human capital focused addressing the *first research objective.*

The comprehensive and holistic view discussed in the previous section as part of addressing the *third research objective* supports the need for development of governance wave in the GO's which would enhance the stakeholders value (Alstete and Halpern, 2008; Wiig, 2002). This integrates with the efforts that create culture of learning, change management, continual process improvement and organizational self-actualization (Hurbet and Lemons, 2009; Wisdom Source Technologies, 2008; Salleh and Ahmed, 2008; Rothberg and Ericson, 2005; APQC, 1996). The understanding presented in this research helps GO's decision makers and government leaders to focus more on indicators that support government reform programmes, this contributes to better understanding of the consequences of KM implementation. Moreover, the study helps focus on consistently

planned KM practices that would serve better the public rather than just trying to steer it (Denhardt and Denhardt, 2000).

This research practically deals with the government entities KM needs regardless of their status, characteristics, similarities and variations that pushes the organizations to develop. The diversity in GO's specialties and their influence on the research was controlled in this study by avoiding details of the type of knowledge assets needed and the differences in practising communities (Chawla and Joshi, 2010; Mohamed et al., 2009; Chua and Goh, 2008; Liao et al., 2008). Another practical implication from this study is in discovering the treasures hidden in the various 54 GO's of Bahrain. The continuation in this field of study would help address GO's development and success factors as competitiveness, capacity for innovation, organisational learning, knowledge capture capabilities, etc. which differentiates such an industry from other sectors (Weerawardena et al., 2006). This work support previous recommendation on the influence of knowledge transfer or KM practices that need to be quantified in order to measure its impact on creating greater citizen satisfaction among GO's (Goh, 2002). This can support other research as it shows knowledge sharing in GO's enhancing the innovation capability thus can make the GO's initiatives more customised to specific development practice outcome (Lundvall and Nielsen, 2007; Lin, 2006).

This is research expected to help GO's decision makers and practitioners since it can help to:

1. Create a focus on the power of organisational internal resources thus helping overcome the challenges that GO's are facing in the economic turbulences (Ingraham et al., 2000).
2. Support measuring the influence of initiatives that are introduced because of their relevance to organizational development (Chua, 2009).
3. Address the scarcity of integrative analysis found for the organisational development practices during different government initiatives towards better organisational competitiveness.

4. Appreciate KM as a possible strategic tool in knowledge economy that lead to sustained income.
5. Supports earlier work that emphasis GO's KM commitment supporting organization learning capacity (Massingham and Diment; 2009).
6. The understanding developed by this research can help GO's to build capacity in delivering more competitiveness services.
7. Create the necessary knowledge for government decision makers about the key determinants of organizational competitiveness.

C) Research role in reducing the gap between KM research and practice

This section address how this research tried to reduce the gap between research and practice that remained significant due to failing to address the "how" questions in KM literature and specifically in the context of government organisations. The research model tries to integrate the macro dimensions that illustrate real influence of KM and its mechanism towards creating OC. The researcher moreover considered the existing government development practices in the region of study, i.e. GCC countries where business excellence models are clearly the most important practices available in governmental entities today (Castilla and Riuz, 2008). This study also supports recent (Kasim 2008) results which support practices in the area of government organizational performance and competitiveness area. The outcome of this research further emphasizes the non-economic aspects thus suggesting a practical way of measuring competitiveness. Accordingly, this research can be a source for reviewing the APQC-KM Assessment Tool (KMAT), OECD KM Survey and the World Bank KM Index (KMi), since it would help address status of knowledge in comparison to broader organisational development issues (APQC 2001). This survey even pushes to practically measure the five different concepts in one universal practical tool, targeting to establish KM best practices from such tools where cause and effect relationship is still considered to be a challenge specifically in GO's (Zhang, 2008). Based on this study survey, this novel instrument can be further developed towards being practically used for organisational self-assessment for optimisation of KM initiatives and other organisational development practices which should help maximise the value created from knowledge in all parts of the government.

8.5 Limitations of the research

Any thesis limitations comes from its scope and method used, this section examines the thesis in light of both methodological and general limitations reported in this study:

D) Methodological Limitations

The most important methodological limitation is the decision to use a quantitative method through a designed questionnaire. Even though this method brought lots of advantage, it also raised *drawback in having no normative data available for comparison due to the lack of empirically validated questionnaire with similar nature questions*. Due to the issue faced in this research, the selection of published questionnaire or to use researcher designed instrument has taken an extensive time. The researcher later decided that all KM surveys available would not provide the type of data needed specifically for the purpose of the *research objectives.* The questionnaires filled by the targeted population of top and middle management were collected through organisation coordinators assigned by the researcher. Although this approach has been used commonly in similar line of studies, direct interviews with top and middle management followed by the KM-OC survey could have minimised the possible effects of systematic response bias (Boumarafi and Jabnoun, 2008; Al-Alawi et al. ,2007; Al-Busaidi and Olfman, 2005; Sotirakou and Zeppou, 2004). However, as mentioned in Chapters Three and Four, confidentiality and sensitivity of positions of the targeted population in the context of government organisations would have made the data collection efforts with interviewing more difficult.

The other methodological limitation point is that this research could have produced a more enlightened result by *observing the effects of KM implementation on the GO's over a period of time using a longitudinal research*; which can be an area for future research (De Vaus, 2002). The novel KM-OC survey which was incorporated based on the comprehensive review of literature pertaining to KM influence and specific research objectives could not solve the bias caused by self reporting (Neuman, 2003). *The self report instrument set*

based on variables that are measured based on managerial perception and therefore, may have a degree of subjectivity.

Reflecting the participants perceptions at a captured situation or an event at a point of time similarly represent another possible limitation. Had this research been possible to administer to all levels of GO's staff; the result may have presented a different possibility to improve the understanding of KM influence situation. This raised another lagging limitation which comes from the way data collection measures were set, including the extension of time frame. *Lack of prior research on the subject made the comparison of results on the survey difficult to measure.* The lengthy questionnaire constructed was to capture all constructs of the study which required time from the participants to fill and might have caused an error in filling in.

E) General Limitations

This research carries general limitations that most research of this nature and size within the limited scope would go through. The different sizes and variety of the 54 speciality government organisations *in one country limited the possibility of this research generalisation claim,* unless it is empirically tested in other countries and regions (Neuman, 2003). Several constructs have been examined to give a holistic perspective, as per the *third research objective,* but this might have *minimised the chances of focusing on one construct in detail.* Discussion in Chapter Seven led to a number of questions as *to what extent can these finding be generalised for other countries in the same context and even other contexts of importance to the economy.* The effectiveness of KM initiatives due to the type of knowledge and its rarity was also not measured in this research even though it was seen as a key factor in facilitating the success of knowledge integration initiatives with other practices towards better organisational competitiveness (Seba and Rowley, 2010; Lundvall and Nielsen, 2007; Cong and Pandya, 2003; Goh, 2002). The level of total sustained synergistic relations influence that KM is creating towards taking organisational competitiveness was also not addressed in this study even though been the interest of some of the recent researches (Zheng et al., 2010). Furthermore *it is not clear the extent of total*

effects that culture and government developments had on the findings, which can be a source for future research.

8.6 Proposed future work

This study has opened *different possibilities for future research* and *painted a number of research directions* that would be useful for not only to the academic researchers, but similarly to the government practitioner. Taking Nonaka (1998) call for not looking at the organizations like machines, but living organisms, requires a continuation for the holistic approach towards using and managing knowledge.

It is highly recommended from this research to continue *investigating other salient variables and/or relations that would complement the model proposed* in this study between KM and OE, OL, OI and OC, especially in a turbulent economy and where the need for holistic approach between the practices of knowledge economy is still rare in government organisations. This might approached through running the setting on another set of data or on other country. Also, it might be suitable to see why the model could not fit through running interview with the decision makers within the GO's. To accomplish such transformation, government organisations need to review their infrastructures that support the practices proposed while being supported by human capital as another possible factor (McLaughlin et al., 2008; Hsu, 2008, Marr et al.,2004). Furthermore, the concept of organisational competitiveness in the presence of KM initiative in governmental organisations still needs to be more empirically addressed. *One of the important areas which can be taken up by researchers in the further course of study is the establishment of the path flow from KM to OC through OL, OI and OE or any other prevalent organisational development practices.* If this directional flow can be established then it would give the organisations definite path to follow reaching towards OC with the presence of one main KM initiative which is the ultimate goal of any organisation.

Therefore study can be a source for future studies on the role played by KM in service or product differentiation in the government sector which would enhance further countries

competitiveness in continuation to Thornhill (2006) research. Further studies of this nature or in line with research can focus on the maturity of the KM and OC relationship, which has not been given enough focus in this research due to limitation of the scope. *Thus it is highly recommended that this study is repeated in other contexts and in other countries* which could complement other recent KM influence studies carried in Singapore, Malaysia, Pakistan, and India (Yusof et al., 2012; Kumar and Rose, 2012; Abass et al., 2011; Chawla and Joshi, 2010; Chua, and Goh, 2008). This surely would add value to early attempts proposed by (Robinson et al. 2006) and (Isaai and Amin 2006). *The KM relevance to countries knowledge economy can still be tackled from addressing the proposed holistic approach for GO's or other organisation context.* For example, it would add more value to the body of knowledge *to see how such proposed model contributes to any organisation through empirically studying the reduced cost of development of a new product or service development and in relevance to increasing the productivity or making knowledge more accessible* (Lim et al., 1999). It would be worthwhile for the concept of KM to integrate this research more clearly with newly emerging intellectual capital concepts to see how the set of the variables of OE, OL and OI variables lead to more or less effectiveness towards organisational competitiveness (Hsu, 2008). The presence of an organisational IT infrastructure, learning strategies, trust culture and flexible structures might also be a good area to be studied and linked to this research in continuation to work of Rhodes et al. (2008) and Yang (2007).

The researches on government organisations need to continue addressing KM initiatives that would help establish the four P's that Zack (2003) mentioned, which lead to towards knowledge-based organization through identifying the (*process, place, purpose and perspective)* in relevance to KM. The role of government organisation *processes* need to be studied on whether it would have an influence on the organisation development practices. Same would apply on whether the *purposes* of sharing and creating knowledge can affect the outcome of this influence. Since each government organisation has its purpose, i.e. its separate mission and strategy; the KM influence studies can also endeavour in this area to see whether this has an impact on the outcome of the organisational overall development. The *perspective* of culture constrains also should be taken as a source that triggers future

research in this area, future research on the subject needs to continue to explore the *place*, i.e. where the boundaries of KM practices would need to continue to have more influence on OC. Furthermore, a *comparative study on the holistic KM influence on GO's of other countries will enhance the proposed conceptual KM model of this study in the line of where KM can influence most.* Based on the conclusions arrived at and discussed in previous chapters; this thesis argues that developing GO's practices can be greatly influenced by KM. For this study to be implemented, *practical programs starting from KM strategy and country's vision with clear milestones can surely help in assessing its practicality and improving its outcome*. This situation suggests more studies to be done on the *gradual movement by GO's to become competitive in KE using the proposed model.* Once this model has been implemented, better control measures between the different organisational development practices can be applied.

For GO's, this research shows the way that top government officials should look at in management of knowledge that would lead to organisation competitiveness. If GO's understand the spirit KM practices brings along to the organisation this clarify how value added are KM holistic initiatives for the survival of governments in a more turbulent economy. This study provides an opportunity for future work that focus on the strength of integrating diversity of disciplines underlying a proposed framework, and to tackle important issue in the context of government organisations. Thus, selecting and implementing the appropriate KM model is highly essential for GO's to better face the reality of the changing environment. That makes *the continuous effort for the development of a model that follows a holistic approach not just desirable, rather necessary, since such approach would manage to establish a joint methodology linking KM with other disciplines that would support building up the organisational competitiveness with more confidence.* Therefore, this study help practitioners understand the crucial role that KM plays in generating new organisational change with different development values. This gives importance to the empirically tested survey instrument which helped establish a mechanism that lead organisations to take concrete decisions on the role of each of the five prevalent organisational development practices in any one organisation.

This type of research work should further help organisations see the way forward *how KM can be utilized and organisational competitiveness can be targeted.* Therefore *this work if repeated and enhanced would help answer top and middle management questions to help their organisations be more effective in implementing KM practices.* Even more, such line of study should help gradually answer *what tools can be used to assess whether government organisations are being KM practice mature entity,* due to the nature of scales used, that reflects the organisational status at the time of data capturing. Similarly, this type of research outcome *should help identify studies relevant to other organisational development* as OE, OL, OI and OC. Finally, future research should *continue in line helping trigger thoughts,* illustrating the way in which government organisations can start certain KM initiative leading them towards competitiveness. *The new channels opened by this study might help to shift the current KM research focus towards the importance of the holistic approach studies or program designs which brings in the concepts of synergy in the organisations development journey.* Readiness for change and adoption of KM initiatives and relevant organisational development practices in the context of government organisations open a practical possibility for better means of government transformations. *Future research is recommended to continue facilitating the optimisation of KM ability towards boosting more government competitiveness which would be value-added to the world and its stability.*

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Appendix

Appendix (1a) Screening of Context Status Questionnaire

Purpose: To Check the available status of GO relevant to

This questionnaire is designed to collect early information about the Government Organisation's (GO's) practices from Middle and Top Management Levels which would be the basis for further questionnaires.

PART 1: Demographics

Personal Information

Position:

□ 1) Under Secretary □ 2) Asst Under Secretary □ 3) Manager

□ 4) Head Of Dept □ 5) Others : ……

PART 2: Organisation Information

1-How do you prefer to share and transfer knowledge in your GO?

□ 1) Direct Meeting □ 2) Training □ 3) Printed Material

2-Any previous experience or knowledge on Governmental Excellence Programs (GEP) ?

□ 1) Yes □ 2) No

3-Do you believe that GEP can create impact on GO Performance in KE?

□ 1) Yes □ 2) No

4- What type of challenges for creating Excellence in GO?

□ 1) No Commitment to Apply □ 2) Obstacles relevant to Process □ 3) Knowledge Sharing

□ 4) Laws □ 5) Top Mngt □ 6) Culture □ 7) others

5- Do understand what is Knowledge Management?

□ 1) Yes □ 2) No

6- What type of Partnership Programs does your GO have?

□ 1) Yes □ 2) No

Thank you for taking your time to fill the questionnaire. Please return the questionnaire to:

Mohamed Buheji - e-mail: buheji@itqan.net

Please feel free to call me should you have any comments or clarifications regarding this questionnaire on Tel. 39650647.

Appendix (1b) Context Screening Survey Summary of outcomes

Discussion on Outcome of the Status Survey

The status survey was planned to screen the context under study and ensure it suitability for this scope of the study, especially with the rare information available on the area in this subject. The survey was intentionally light and smooth in one page and just taken an average of 3 minutes to fill. The total collected sample from GO's participating in this survey was 100, while those the accepted questionnaire were 70; representing a targeted population of 800 top and middle manager from the Civil Service of Government of Bahrain. The Survey was distributed and gathered in the same day in one of the early gatherings of Bahrain Centre of Excellence which is a government initiative program to raise the awareness about Excellence and KM practices in public sector. The gathering was an opportunity as it had a good representation of 54 government organisations listed by the Civil Service Bureau.

Majority of the participants (37%) and (32%) were respectively from the top management (Under Secretary or Assistant-under Secretary) and Middle Management (Director, Heads of Departments and those of the same level). The participants in this status survey seen that knowledge sharing is already done through training and direct meetings. There was specific question on experience about the relation of Governmental Excellence Programs initiative and KM practices. Respectively, 68% and 61% seen a relation between excellence and KM, where Organisational Excellence (OE) is believed to create influence on GO Performance in KE. When asked about the type of challenges that faces the GO's towards excellence practices, only 9% chosen knowledge sharing to be one of the challenges while the majority (20%) chosen the issue of culture.

However, the most important fact of relevance from this status screening survey is that up to 73% of the participants confirmed that their understanding of what KM (as a top and middle management) is a minimum. This was a major learning point that led the researcher to ensure proper explanation of what are KM and other terminologies in the surveys.

Appendix (2) Participants Consent and Ethics Approval

Appendix (2a) Participants Consent Form – Bahrain Government

Brunel
UNIVERSITY
WEST LONDON

Brunel Business School
Research Ethics
Participant Consent Form

Many thanks for agreeing to participate in my research project. The project has to be completed in part fulfilment of my degree programme and so your assistance is much appreciated.

Consent:
I have read the Participation Information Sheet and hereby indicate my agreement to participate in the study and for the data to be used as specified.

Name of participant or informed third party: [Prime Minister Court –Government of Bahrain]

Signature: [Dr. Hussam bin Essa Al-Khalifa]

Date: [15/8/2010]

Appendix (2b) Ethics Approval Statement

Brunel
UNIVERSITY
WEST LONDON

Brunel University, Uxbridge,
Middlesex, UB8 3PH, UK
Telephone +44 (0)1895 274000
Web www.brunel.ac.uk

Brunel Business School
Research Ethics Committee

09 September 2010

STATEMENT OF ETHICS APPROVAL

Proposer: Mohamed Buheji

Title: Knowledge Management and the organisational status Questionnaire

It should be noted that, the Brunel Business School's research ethics committee has considered the above named proposal. Acting under a delegated authority, the committee is satisfied that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the applicant will adhere to the terms agreed with participants and to inform the committee of any change of plans in relations to the information provided in the application form.

Should you require further information, please do not hesitate to contact me.

Yours sincerely,

Dr. Tillal Eldabi
Chair, Research Ethics Committee
Brunel Business School

Appendix (3) Survey Invitation Letter (Sent to Organisation Coordinators)

You are kindly invited to participate in an academic research conducted by ***Mr . Mohamed Buheji*** , this research is part of a PhD thesis work conducted under the supervision of Brunel University-London. The objective of this research is to examine the effect of Knowledge Management on Organisational Status (represented by: Organisational Competitiveness, Organisational Excellence, Organisational Learning and Organisational Innovation). This survey focuses on answering the following research question *"To what extent does KM influence the performance and government organisation status towards competitiveness?"*

This academic survey is targeting governmental and semi-governmental organisations through focusing on the ***Top and Middle Management*** of each organisation. The questionnaire should take around 20-30 minutes, and would appreciate if each question is answered to improve the study output. As an expression of my sincere appreciation, a report of the findings will be emailed to you on request. The result of this research would help you as a decision maker in the organisation to understand and benchmark the Knowledge Management influence in the governmental sector. The survey responses are completely confidential and identification of individual organisations and individuals filling the questionnaire would not be the purpose of this project.

Should you require any further information, please arrange through your survey coordinator to e-mail me on: buheji@itqan.net – or even feel free to call me should you have any other comments or clarifications regarding this questionnaire on Tel. 39650647.
Thank you again for your support and time given.

Yours sincerely,
Mohamed Buheji

Appendix (4) Main (KM-OC) Survey

KM-OC Survey Questionnaire *(with Coded ID's for ease of Data Analysis)*

Questionnaire filled Number:
This survey is made of **3 main sections** , please make sure you fill all the sections

Section 1: Demographics
Please choose what is appropriate *(word in italic = how it is coded)*

Personal Information
Gender: *(Sex)* Male / Female

Age: *(Age)* (1) Less than 25 (2) Between 25-34 (3) Between 35-45 (4) Between 46-50 (5)Above 50

Your Position (Please Select One) *(Post)*
□ (1) Under Secretary □ (2) Manager / Director □ (3) Department Head
□ (4) Specialist in ……. □ (5) Other : ……

Section 2: Understanding the General Organisational Knowledge Management Status
This section aims to support the understanding of the general Knowledge Management status of the organisation as perceived by the participants to support the evaluation of Section 3.

Please tick ☑ most appropriate
1-What type of Services your Government Organisation (GO) delivers ? *(Q1)*
□ 1) Life necessity services (Education –Health- Security)
□ 2) Innovative and Government Services Development
□ 3) Infrastructure related services
□ 4) Government Rights Protection Services
□ 5) Others .....

2- How do you rate the Impact of Knowledge Management Practices on your organisation? *(Q2*)

□ 1) Very High □ 2) High □ 3) Medium □ 4) Low □ 5) Very Low

3. How do you rate level of maturity in Knowledge Management Practices in your organisation? *(Q3)*

□ 1) Just starting to realise its importance
□ 2) We are in the early of Implementation Stage
□ 3) We are in the middle of Implementation Stage
□ 4) We are considered mature in implementation
□ 5) We are considered in advance matured implementation

4.Does your organisation consider knowledge as a main asset? *(Q4)*

□ 1) Yes □ 2) No □ 3) Don't know

5. What are the challenges facing the proper implementation of Knowledge Management in your organisation? *(Q5)*

□ 1) Scarcity of information shared
□ 2) Huge information to be managed
□ 3) It is seen as a repetitive work or other slogan for other development projects
□ 4) Loss of lots of tacit knowledge due to high employee turnover
□ 5) Weakness of knowledge sharing practices
□ 6) Lack of trust

6- How do you rate the length of time needed to get knowledge related material ? *(Q6)*

□ 1) in minutes □ 2) in hours □ 3) in few days □ 4) in few weeks
□ 5) Other …… (please specify)

7- Which of the following statements represents your organisational culture? *(Q7)*

□ 1) Knowledge management is not well utilised
□ 2) Our organisation has a culture that is based on total people involvement
□ 3) Knowledge management is considered in every operation and process
□ 4) Knowledge management is the responsibility of Information Management System Department.
□ 5) Our organisation values are established based on knowledge sharing

Section 3: Knowledge Management and the Performance of Government Organisations

This section aims to measure the Knowledge Management influence through 5 constructs made of 10 variables reflected in 10 questionnaire items as per the Likert Scale. Please tick what is most appropriate statement in your organisation today:

Part ONE – Measuring " Organisational Competitiveness "

A) Internal Organisational Competitiveness Indicators

No.	**Statements of Indicators**	**Strongly Disagree** (1)	**Disagree** (2)	**Neutral** (3)	**Agree** (4)	**Strongly Agree** (5)
1 *(q11)-*	Our organisation has improved its ability to identify new services opportunities	1	2	3	4	5
2 *(q12)-*	Our Organisation adopts quickly to unanticipated change	1	2	3	4	5
3 *(q13)-*	Our organisation can create a good profitable income for government with Return on Investment	1	2	3	4	5
4 *(q14)*	Our organisation has the ability to react to customer demands	1	2	3	4	5
5 *(q15)*	Our Organisation always streamline it processes	1	2	3	4	5

B) External Organisational Competitiveness Indicators

6 *(q16)*	Our organisation has plans for future that would ensure sustainability of services	1	2	3	4	5
7 *(q17)*	Our organisational has analytical capabilities that leads to learning from mistakes	1	2	3	4	5
8 *(q18)*	Our organisational has a unique way in dealing with customers with intimacy	1	2	3	4	5
9 *(q19)*	Our organisational has established unique values with its employees that are difficult to copy	1	2	3	4	5
10 *(q101)*	Our organisation has established high quality services / products with low cost and high speed of delivery	1	2	3	4	5

Part TWO – Measuring "Knowledge Management"						
No.	**Statements of Indicators**	**Strongly Disagree** (1)	**Disagree** (2)	**Neutral** (3)	**Agree** (4)	**Strongly Agree** (5)
1 *(q21)*	Our organisation top management appreciates the market value of human capital knowledge	1	2	3	4	5
2 *(q22)*	Our organisation has clearly defined and documented knowledge management strategies	1	2	3	4	5
3 *(q23)*	Our organisation has implemented knowledge management Policies to improve its service delivery	1	2	3	4	5
4 *(q24)*	Our organisation is acquiring knowledge while modifying its behaviors accordingly	1	2	3	4	5
5 *(q25)*	Our organisation has a listing of all Knowledge Assets inventory.	1	2	3	4	5
6 *(q26)*	Our organisation managed to build up an ability to capture knowledge which is used to develop specific programs	1	2	3	4	5
7 *(q27)*	Our organisational decision making process depends on knowledge transfer	1	2	3	4	5
8 *(q28)*	Our organisation always shares its knowledge with its partners	1	2	3	4	5
9 *(q29)*	Our organisation effectively manage it knowledge assets to generate new ideas	1	2	3	4	5
10 *(q201)*	Our organisation has a clear process of capturing the collective expertise and intelligence	1	2	3	4	5

Part THREE – Measuring "Organisational Excellence"						
No.	**Statements of Indicators**	**Strongly Disagree** (1)	**Disagree** (2)	**Neutral** (3)	**Agree** (4)	**Strongly Agree** (5)
1 *(q31)*	Our organisation leaders pinpoints the change needed and provide all necessary resources to make it happen	1	2	3	4	5
2 *(q32)*	Our organisation has established plans for facilitating the adaptation to change.	1	2	3	4	5
3 *(q33)*	Our organisation continuously reviews its progress towards achieving strategic objectives.	1	2	3	4	5
4 *(q34)*	Our organisation ensure that employees knows their responsibility towards the customers and organisation's objectives	1	2	3	4	5
5 *(q35)*	Our organisation has close, long-term relationships with its partners designed to resolve quality-related problems	1	2	3	4	5
6 *(q36)*	Our organisation continuously improves its operation through meeting best service delivery at best quality and best cost	1	2	3	4	5
7 *(q37)*	Our organisation has effective communication between all the levels of management	1	2	3	4	5
8 *(q38)*	Our organisation work on values that are reflected into the society and its ability to collaborate with other organisations	1	2	3	4	5
9 *(q39)*	Our organisation ensure compliance to customer needs through processes that are designed to deliver the right skills and capacities	1	2	3	4	5
10 *(q301)*	Our organisation combined continuous environmental reviews intended to maintain or improve performance	1	2	3	4	5

Part FOUR – Measuring "Organisational Learning"						
No.	**Statements of Indicators**	**Strongly Disagree** (1)	**Disagree** (2)	**Neutral** (3)	**Agree** (4)	**Strongly Agree** (5)
1 *(q41)*	Our organisation employees feel free to speak their minds about what they have learned	1	2	3	4	5
2 *(q42)*	Our organisation turns mistakes into constructive learning experiences	1	2	3	4	5
3 *(q43)*	Our organisation encourages and cultivates multiple viewpoints and open productive debates	1	2	3	4	5
4 *(q44)*	Our organisation has the ability to breaks old patterns in order to experiment with different ways of organizing and managing daily work	1	2	3	4	5
5 *(q45)*	Our organisation conducts Lessons learned sessions	1	2	3	4	5
6 *(q46)*	Our organisation teams are recognized and rewarded for paradigm breaking solutions to problems	1	2	3	4	5
7 *(q47)*	Our organisation employees learning is considered more of an investment than an expense	1	2	3	4	5
8 *(q48)*	Our organisation has interaction sessions that enhances sharing of experiences	1	2	3	4	5
9 *(q49)*	Our organisation has proper programs that close skill gaps and enhance proficiency	1	2	3	4	5
10 *(q401)*	Our organisation involves personnel in important decisions	1	2	3	4	5

Part FIVE – Measuring "Organisational Innovation"						
No.	**Statements of Indicators**	**Strongly Disagree** (1)	**Disagree** (2)	**Neutral** (3)	**Agree** (4)	**Strongly Agree** (5)
1 *(q51)*	Our organisation has clear social networks that supports innovative capabilities	1	2	3	4	5
2 *(q52)*	Our organisation has reward scheme based on the value of innovation	1	2	3	4	5
3 *(q53)*	Our organisation business results focus should be based on customers and understanding changing demands.	1	2	3	4	5
4 *(q54)*	Our organisation has established mechanisms that harness the innovativeness of key individuals and teams to create value	1	2	3	4	5
5 *(q55)*	Our organisation combines the knowledge with results to build a new products and / or services	1	2	3	4	5
6 *(q56)*	Our organisation brings new products and/or services on a yearly basis	1	2	3	4	5
7 *(q57)*	Our organisation culture supports transfer of best practices that leads to new developments	1	2	3	4	5
8 *(q58)*	Our organisation has all the facilities that enhance team work	1	2	3	4	5
9 *(q59)*	Our organisation has the ability of speeding up creative ideas	1	2	3	4	5
10 *(q501)*	Our organisation would develop new ideas from capturing achievements and failures	1	2	3	4	5

Appendix (5) Missing Value Analysis Tables

Table (A-5-1) Missing value in demographic data

Category	Missing	
	Count	Percent
Sex	9	1.4
Age	9	1.4
Post	27	4.3

Table (A-5-2) Missing values in Section 2: Understanding the General Organisational Knowledge Management Status

Category	Missing	
	Count	Percent
What type of Services your Government Organisation (GO) delivers ? (Q1)	18	2.9
How do you rate the Impact of Knowledge Management Practices on your organisation? (Q2)	6	1.0
How do you rate level of maturity in Knowledge Management Practices in your organisation? (Q3)	6	1.0
Does your organisation consider knowledge as a main asset? (Q4)	6	1.0
What are the challenges facing the proper implementation of Knowledge Management in your organisation? (Q5)	9	1.4
How do you rate the length of time needed to get knowledge related material? (Q6)	5	.8
Which of the following statements represents your organisational culture? (Q7)	5	.8

Table (A-5-3) Part ONE – Missing values in "Organisational Competitiveness" of Section 3: Knowledge Management and the Performance of Government Organisations

Category	Missing	
	Count	Percent
Our organisation has improved its ability to identify new services opportunities (q11)	2	.3
Our Organisation adopts quickly to unanticipated change (q12)	2	.3
Our organisation can create a good profitable income for government with Return on Investment (q13)	9	1.4
Our organisation has the ability to react to customer demands (q14)	3	.5
Our Organisation always streamline it processes (q15)	13	2.1
Our organisation has plans for future that would ensure sustainability of services (q16)	10	1.6
Our organisational has analytical capabilities that leads to learning from mistakes (q17)	6	1.0
Our organisational has a unique way in dealing with customers with intimacy (q18)	5	.8
Our organisational has established unique values with its employees that are difficult to copy (q19)	7	1.1
Our organisation has established high quality services / products with low cost and high speed of delivery (q101)	10	1.6

Table (A-5-4) Missing values in Part TWO – Measuring "Organisational Knowledge Management" of section 3: Knowledge Management and the Performance of Government Organisations

Category	Missing	
	Count	Percent
Our organisation top management appreciates the market value of human capital knowledge (q21)	4	.6
Our organisation has clearly defined and documented knowledge management strategies (q22)	9	1.4
Our organisation has implemented knowledge management Policies to improve its service delivery (q23)	8	1.3
Our organisation is acquiring knowledge while modifying its behaviors accordingly (q24)	8	1.3
Our organisation has a listing of all Knowledge Assets inventory (q25)	7	1.1
Our organisation managed to build up an ability to capture knowledge which is used to develop specific programs (q26)	8	1.3
Our organisational decision making process depends on knowledge transfer (q27)	8	1.3
Our organisation always shares its knowledge with its partners (q28)	7	1.1
Our organisation effectively manage it knowledge assets to generate new ideas (q29)	5	.8
Our organisation has a clear process of capturing the collective expertise and intelligence (q301)	14	2.2

Table (A-5-5) Missing values in Part THREE – Measuring "Organisational Excellence" of section 3: Knowledge Management and the Performance of Government Organisations

Category	Missing	
	Count	Percent
Our organisation leaders pinpoints the change needed and provide all necessary resources to make it happen (q31)	7	1.1
Our organisation has established plans for facilitating the adaptation to change. (q32)	5	.8
Our organisation continuously reviews its progress towards achieving strategic objectives.(q33)	9	1.4
Our organisation ensure that employees knows their responsibility towards the customers and organisation's objectives (q34)	3	.5
Our organisation has close, long-term relationships with its partners designed to resolve quality-related problems (q35)	10	1.6
Our organisation continuously improves its operation through meeting best service delivery at best quality and best cost (q36)	6	1.0
Our organisation has effective communication between all the levels of management (q37)	5	.8
Our organisation work on values that are reflected into the society and its ability to collaborate with other organisations (q38)	5	.8
Our organisation ensure compliance to customer needs through processes that are designed to deliver the right skills and capacities (q39)	9	1.4
Our organisation combined continuous organisational reviews intended to maintain or improve performance (q401)	6	1.0

Table (A-5-6) Missing values in Part FOUR – Measuring "Organisational Learning" of section 3: Knowledge Management and the Performance of Government Organisations

Category	Missing	
	Count	Percent
Our organisation employees feel free to speak their minds about what they have learned (q41)	6	1.0
Our organisation turns mistakes into constructive learning experiences (q42)	8	1.3
Our organisation encourages and cultivates multiple viewpoints and open productive debates (q43)	9	1.4
Our organisation has the ability to breaks old patterns in order to experiment with different ways of organizing and managing daily work (q44)	7	1.1
Our organisation conducts Lessons learned sessions (q45)	9	1.4
Our organisation teams are recognized and rewarded for paradigm breaking solutions to problems (q46)	9	1.4
Our organisation employees learning is considered more of an investment than an expense (q47)	11	1.8
Our organisation has interaction sessions that enhances sharing of experiences (q48)	6	1.0
Our organisation has proper programs that close skill gaps and enhance proficiency (q49)	10	1.6
Our organisation involves personnel in important decisions (q501)	9	1.4

Table (A-5-7) Missing values in Part FIVE – Measuring "Organisational Innovation"

Category	Missing	
	Count	Percent
Our organisation has clear social networks that supports innovative capabilities	17	2.7
Our organisation has reward scheme based on the value of innovation	14	2.2
Our organisation business results focus should be based on customers and understanding changing demands.	13	2.1
Our organisation has established mechanisms that harness the innovativeness of key individuals and teams to create value	17	2.7
Our organisation combines the knowledge with results to build a new products and / or services	15	2.4
Our organisation brings new products and/or services on a yearly basis	18	2.9
Our organisation culture supports transfer of best practices that leads to new developments	17	2.7
Our organisation has all the facilities that enhance team work	20	3.2
Our organisation has the ability of speeding up creative ideas	12	1.9
Our organisation would develop new ideas from capturing achievements and failures	19	3.0

Appendix (6) Cronbach Alpha for All Organisation Development Variables

Scale: OC alpha

Table (A-6-1-1) OC alpha - Case Processing Summary

		N	%
Cases	Valid	581	93.0
	Excludeda	44	7.0
	Total	625	100.0

a. Listwise deletion based on all variables in the procedure.

Table (A-6-1-2) OC Scale Reliability Statistics

Cronbach's Alpha	N of Items
.867	10

Scale: KM alpha

Table (A-6-2-2) KM alpha- Case Processing Summary

		N	%
Cases	Valid	585	93.6
	Excludeda	40	6.4
	Total	625	100.0

a. Listwise deletion based on all variables in the procedure.

Table (A-6-2-2) KM Scale- Reliability Statistics

Cronbach's Alpha	N of Items
.921	10

Scale: OE alpha

Table (A-6-3-1) OE alpha Case Processing Summary

		N	%
Cases	Valid	592	94.7
	Excludeda	33	5.3
	Total	625	100.0

a. Listwise deletion based on all variables in the procedure.

Table (A-6-3-2) OE Scale Reliability Statistics

Cronbach's Alpha	N of Items
.913	10

Scale: OL alpha

Table (A-6-3-1) OL alpha- Case Processing Summary

		N	%
Cases	Valid	584	93.4
	Excludeda	41	6.6
	Total	625	100.0

a. Listwise deletion based on all variables in the procedure.

Table (A-6-3-2) OL Scale- Reliability Statistics

Cronbach's Alpha	N of Items
.929	11

Scale: OI alpha

T**able (A-6-4-1) OI alpha - Case Processing Summary**

		N	%
Cases	Valid	579	92.6
	Excludeda	46	7.4
	Total	625	100.0

		N	%
Cases	Valid	579	92.6
	Excludeda	46	7.4
	Total	625	100.0

a. Listwise deletion based on all variables in the procedure.

Table (A-6-4-2) OI Scale- Reliability Statistics

Cronbach's Alpha	N of Items
.905	9

Scale: Full alpha

Table (A-6-5-1) Full alpha- Case Processing Summary

		N	%
Cases	Valid	505	80.8
	Excludeda	120	19.2
	Total	625	100.0

a. Listwise deletion based on all variables in the procedure.

Table (A-6-5-2) Full alpha- Reliability Statistics

Cronbach's Alpha	N of Items
.975	50

Validity analysis -Cross-correlation procedure was used on the entire data.

Appendix (7) Correlations Tables between the five prevalent Organisational Development Practices

Table (A-7-1) Correlations OC-OE

		Org Competitiveness	Org Excellence
Org Competitiveness	Pearson Correlation	1	.761(**)
	Sig. (2-tailed)		.000
	N	625	623
Org Excellence	Pearson Correlation	.761(**)	1
	Sig. (2-tailed)	.000	
	N	623	623

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-2) Correlations OI-OC

		Org Innovation	Org Competitiveness
Org Innovation	Pearson Correlation	1	.713(**)
	Sig. (2-tailed)		.000
	N	615	615
Org Competitiveness	Pearson Correlation	.713(**)	1
	Sig. (2-tailed)	.000	
	N	615	625

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-3) Correlations OC-KM

		Org Competitiveness	Knowledge Management
Org Competitiveness	Pearson Correlation	1	.766(**)
	Sig. (2-tailed)		.000
	N	625	623
Knowledge Management	Pearson Correlation	.766(**)	1
	Sig. (2-tailed)	.000	
	N	623	623

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-4) Correlations OC-OL

		Org Competitiveness	Org Learning
Org Competitiveness	Pearson Correlation	1	.681(**)
	Sig. (2-tailed)		.000
	N	625	622
Org Learning	Pearson Correlation	.681(**)	1
	Sig. (2-tailed)	.000	
	N	622	622

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-5) Correlations OC-KM

		Org Competitiveness	Knowledge Management
Org Competitiveness	Pearson Correlation	1	.766(**)
	Sig. (2-tailed)		.000
	N	625	623
Knowledge Management	Pearson Correlation	.766(**)	1
	Sig. (2-tailed)	.000	
	N	623	623

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-6) Correlations KM-OE

		Knowledge Management	Org Excellence
Knowledge Management	Pearson Correlation	1	.805(**)
	Sig. (2-tailed)		.000
	N	623	623
Org Excellence	Pearson Correlation	.805(**)	1
	Sig. (2-tailed)	.000	
	N	623	623

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-7) Correlations KM-OL

		Knowledge Management	Org Learning
Knowledge Management	Pearson Correlation	1	.753(**)
	Sig. (2-tailed)		.000
	N	623	622
Org Learning	Pearson Correlation	.753(**)	1
	Sig. (2-tailed)	.000	
	N	622	622

** Correlation is significant at the 0.01 level (2-tailed).

Table (A-7-8) Correlations KM-OI

		Knowledge Management	Org Innovation
Knowledge Management	Pearson Correlation	1	.776(**)
	Sig. (2-tailed)		.000
	N	623	615
Org Innovation	Pearson Correlation	.776(**)	1
	Sig. (2-tailed)	.000	
	N	615	615

** Correlation is significant at the 0.01 level (2-tailed).

Appendix (8) Detailed Correlation Table representing relations between all the indicators

Table (A-8-1) OC detailed Correlation

1- Correlation Table representing relations between OC indicators

A) Measuring " Organisational Competitiveness " -Internal Organisational Competitiveness Indicators										
	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q101
Our organization has improved its ability to identify new services opportunities	1	.410**	.174**	.380**	.449**	.452**	.403**	.376**	.362**	.450**
Our Organisation adopts quickly to unanticipated change	.410**	1	.185**	.438**	.519**	.439**	.470**	.442**	.422**	.394**
Our organization can create a good profitable income for government with Return on Investment	.174**	.185**	1	.213**	.193**	.118**	.246**	.187**	.128**	.193**
Our Organisation always streamline it processes	.380**	.438**	.213**	1	.456**	.333**	.464**	.385**	.308**	.382**
Our organization has plans for future that would ensure sustainability of services	.449**	.519**	.193**	.456**	1	.534**	.536**	.509**	.474**	.521**
B) Measuring " Organisational Competitiveness " -External Organisational Competitiveness Indicators										
Our organization has analytical capabilities that leads to learning from mistakes	.452**	.439**	.118**	.333**	.534**	1	.575**	.451**	.376**	.417**
Our organizational has a unique way in dealing with customers with intimacy	.403**	.470**	.246**	.464**	.536**	.575**	1	.547**	.518**	.510**
Our organizational has established unique values with its employees	.376**	.442**	.187**	.385**	.509**	.451**	.547**	1	.516**	.515**
Our organizational has established unique values with its employees that are difficult to copy	.362**	.422**	.128**	.308**	.474**	.376**	.518**	.516**	1	.509**
Our organisation has established high quality services / products with low cost and high speed of delivery	.450**	.394**	.193**	.382**	.521**	.417**	.510**	.515**	.509**	1

Table (A-8-2) KM-OC detailed Correlation

	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q101
Our organisation top management appreciates the market value of human capital knowledge	.374**	.375**	.179**	.307**	.425**	.471**	.467**	.381**	.407**	.418**
Our organisation has clearly defined and documented knowledge management strategies	.364**	.382**	.074	.350**	.494**	.503**	.538**	.400**	.454**	.458**
Our organisation has implemented knowledge management Policies to improve its service delivery	.401**	.398**	.049	.325**	.475**	.479**	.522**	.383**	.416**	.429**
Our organization is acquiring knowledge while modifying its behaviors accordingly	.389**	.412**	.092*	.349**	.442**	.493**	.519**	.436**	.448**	.415**
Our organisation has a listing of all Knowledge Assets inventory.	.336**	.332**	.113**	.279**	.443**	.492**	.479**	.372**	.401**	.445**
Our organization managed to build up an ability to capture knowledge which is used to develop specific programs	.322**	.317**	.081*	.297**	.423**	.438**	.445**	.348**	.447**	.431**
Our organizational decision making process depends on knowledge transfer	.350**	.396**	.155**	.360**	.444**	.430**	.557**	.432**	.483**	.472**
Our organisation always shares its knowledge with its partners	.367**	.410**	.129**	.286**	.443**	.428**	.454**	.395**	.381**	.413**
Our organization effectively manage it knowledge assets to generate new ideas	.407**	.439**	.170**	.367**	.492**	.495**	.561**	.472**	.499**	.464**
Our organisation has a clear process of capturing the collective expertise and intelligence	.410**	.398**	.211**	.356**	.525**	.455**	.560**	.511**	.540**	.499**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table (A-8-3) OI-KM detailed Correlation

3-Correlation Table Representing relation between OI-OKM indicators

	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q201
Our organisation has clear social networks that supports innovative capabilities	.422**	.437**	.389**	.420**	.429**	.496**	.461**	.375**	.479**	.473**
Our organisation has reward scheme based on the value of innovation	.431**	.496**	.463**	.432**	.468**	.454**	.480**	.393**	.488**	.498**
Our organisation business results focus should be based on customers and understanding changing demands.	.316**	.338**	.273**	.351**	.330**	.347**	.365**	.318**	.380**	.313**
Our organisation has established mechanisms that harness the innovativeness of key individuals and teams to create value	.403**	.512**	.478**	.434**	.500**	.487**	.461**	.373**	.539**	.583**
Our organisation combines the knowledge with results to build a new products and / or services	.388**	.495**	.508**	.499**	.500**	.459**	.514**	.443**	.550**	.556**
Our organisation brings new products and/or services on a yearly basis	.341**	.466**	.431**	.377**	.440**	.377**	.447**	.381**	.484**	.480**
Our organisation culture supports transfer of best practices that leads to new developments	.442**	.531**	.492**	.459**	.488**	.446**	.532**	.408**	.570**	.582**
Our organization has all the facilities that enhance team work	.385**	.475**	.429**	.384**	.423**	.366**	.386**	.312**	.410**	.428**
Our organisation has the ability of speeding up creative ideas	.406**	.447**	.445**	.446**	.498**	.430**	.444**	.396**	.530**	.500**
Our organisation would develop new ideas from capturing achievements and failures	.397**	.485**	.465**	.485**	.498**	.445**	.462**	.376**	.507**	.468**

Table (A-8-4) OC-KM detailed Correlation

4-Correlation Table representing the relation between OC-OKM indicators

	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q201
Our organisation top management appreciates the market value of human capital knowledge	1	.466**	.442**	.460**	.389**	.428**	.416**	.410**	.428**	.445**
Our organisation has clearly defined and documented knowledge management strategies	.466**	1	.731**	.557**	.634**	.550**	.518**	.409**	.595**	.571**
Our organisation has implemented knowledge management Policies to improve its service delivery	.442**	.731**	1	.591**	.629**	.587**	.526**	.488**	.598**	.559**
Our organization is acquiring knowledge while modifying its behaviors accordingly	.460**	.557**	.591**	1	.511**	.572**	.526**	.491**	.555**	.467**
Our organisation has a listing of all Knowledge Assets inventory.	.389**	.634**	.629**	.511**	1	.590**	.530**	.436**	.586**	.570**
Our organization managed to build up an ability to capture knowledge which is used to develop specific programs	.428**	.550**	.587**	.572**	.590**	1	.567**	.455**	.551**	.564**
Our organizational decision making process depends on knowledge transfer	.416**	.518**	.526**	.526**	.530**	.567**	1	.539**	.639**	.557**
Our organisation always shares its knowledge with its partners	.410**	.409**	.488**	.491**	.436**	.455**	.539**	1	.594**	.505**
Our organization effectively manage it knowledge assets to generate new ideas	.428**	.595**	.598**	.555**	.586**	.551**	.639**	.594**	1	.691**
Our organisation has a clear process of capturing the collective expertise and intelligence	.445**	.571**	.559**	.467**	.570**	.564**	.557**	.505**	.691**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table (A-8-5) OI-OC detailed Correlation

5- Correlation Table Representing relation between OI-OC indicators

	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q101
Our organisation employees feel free to speak their minds about what they have learned	.295**	.310**	.084*	.287**	.343**	.366**	.423**	.288**	.314**	.309**
Our organization turns mistakes into constructive learning experiences	.352**	.360**	.123**	.308**	.462**	.456**	.547**	.423**	.450**	.450**
Our organization encourages and cultivates multiple viewpoints and open productive debates	.318**	.378**	.110**	.283**	.414**	.423**	.494**	.380**	.415**	.406**
organization has the ability to breaks old patterns in order to experiment with different ways of organizing and managing daily work	.355**	.383**	.147**	.331**	.424**	.424**	.479**	.362**	.402**	.414**
Our organisation conducts Lessons learned sessions	.278**	.380**	.059	.301**	.468**	.412**	.465**	.379**	.455**	.399**
Our organisation teams are recognized and rewarded for paradigm breaking solutions to problems	.286**	.336**	.140**	.296**	.432**	.401**	.476**	.390**	.460**	.417**
Our organization employees learning is considered more of an investment than an expense	.248**	.397**	.142**	.330**	.402**	.364**	.428**	.350**	.423**	.357**
Our organization has interaction sessions that enhances sharing of experiences	.313**	.358**	.077	.311**	.432**	.401**	.480**	.385**	.471**	.377**
Our organization has proper programs that close skill gaps and enhance proficiency	.345**	.351**	.111**	.295**	.436**	.456**	.485**	.393**	.446**	.416**
Our organization involves personnel in important decisions	.331**	.346**	.132**	.266**	.371**	.403**	.461**	.308**	.392**	.324**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table (A-8-6) OE-OC detailed Correlation

6- Correlation Table Representing relation between OE-OC indicators

	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q101
Our organization leaders pinpoints the change needed and provide all necessary resources to make it happen	.338**	.385**	.130**	.298**	.457**	.500**	.479**	.404**	.404**	.397**
Our organisation has established plans for facilitating the adaptation to change.	.323**	.359**	.148**	.293**	.407**	.487**	.492**	.368**	.395**	.365**
Our organization continuously reviews its progress towards achieving strategic objectives.	.441**	.387**	.162**	.303**	.462**	.559**	.509**	.399**	.440**	.440**
Our organisation ensure that employees knows their responsibility towards the customers and organization's objectives	.353**	.353**	.112**	.287**	.412**	.409**	.451**	.394**	.370**	.416**
Our organisation has close, long-term relationships with its partners designed to resolve quality-related problems	.390**	.419**	.213**	.299**	.439**	.417**	.415**	.422**	.400**	.399**
Our organization continuously improves its operation through meeting best service delivery at best quality and best cost	.484**	.399**	.217**	.355**	.511**	.500**	.521**	.486**	.444**	.506**
Our organization has effective communication between all the levels of management	.331**	.382**	.164**	.287**	.430**	.447**	.460**	.431**	.471**	.401**
Our organization work on values that are reflected into the society and its ability to collaborate with other organizations	.336**	.360**	.140**	.310**	.377**	.416**	.453**	.374**	.388**	.465**
Our organisation ensure compliance to customer needs through processes that are designed to deliver the right skills and capacities	.335**	.367**	.165**	.368**	.455**	.456**	.510**	.426**	.436**	.480**
Our organization combined continuous environmental reviews intended to maintain or improve performance	.369**	.367**	.145**	.338**	.428**	.489**	.493**	.398**	.431**	.455**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table (A-8-7) OL-KM detailed Correlation

7-Correlation Table Representing relation between OL-OKM indicators

	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q201
Our organisation employees feel free to speak their minds about what they have learned	.448**	.330**	.331**	.367**	.329**	.342**	.360**	.388**	.403**	.357**
Our organization turns mistakes into constructive learning experiences	.452**	.445**	.440**	.532**	.418**	.408**	.505**	.471**	.529**	.486**
Our organization encourages and cultivates multiple viewpoints and open productive debates	.490**	.424**	.439**	.445**	.415**	.424**	.400**	.393**	.487**	.479**
organization has the ability to breaks old patterns in order to experiment with different ways of organizing and managing daily work	.401**	.435**	.402**	.458**	.415**	.421**	.399**	.418**	.519**	.496**
Our organisation conducts Lessons learned sessions	.402**	.545**	.505**	.463**	.498**	.427**	.460**	.409**	.551**	.533**
Our organisation teams are recognized and rewarded for paradigm breaking solutions to problems	.399**	.474**	.396**	.449**	.520**	.454**	.506**	.426**	.505**	.521**
Our organization employees learning is considered more of an investment than an expense	.440**	.423**	.380**	.459**	.421**	.381**	.492**	.330**	.400**	.431**
Our organization has interaction sessions that enhances sharing of experiences	.429**	.503**	.462**	.428**	.430**	.438**	.465**	.476**	.502**	.511**
Our organization has proper programs that close skill gaps and enhance proficiency	.447**	.497**	.477**	.432**	.497**	.442**	.498**	.413**	.517**	.555**
Our organization involves personnel in important decisions	.454**	.384**	.387**	.425**	.397**	.407**	.443**	.434**	.491**	.449**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

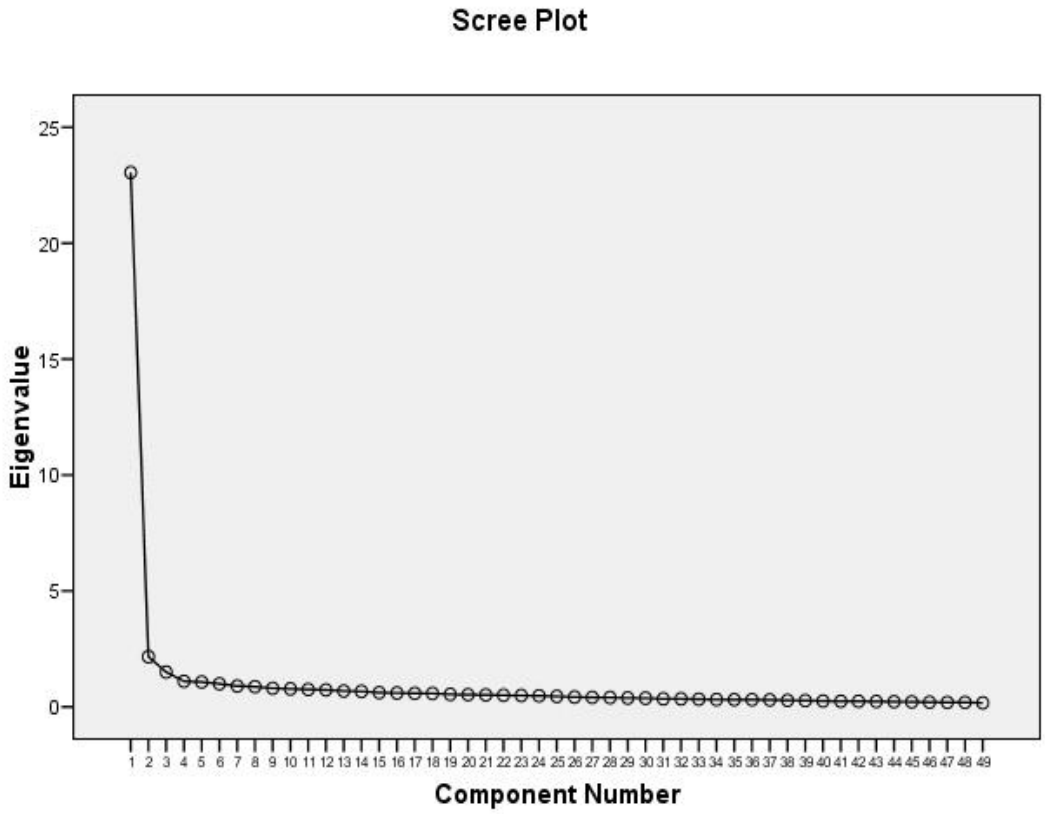
Table (A-8-8) OL-OC detailed Correlation

8-Correlation Table Representing relation between OI-OC indicators

OI Indications	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q101
Our organisation has clear social networks that supports innovative capabilities	.246**	.335**	.087*	.230**	.366**	.362**	.384**	.329**	.433**	.387**
Our organisation has reward scheme based on the value of innovation	.316**	.341**	.155**	.270**	.425**	.403**	.470**	.387**	.444**	.401**
Our organisation business results focus should be based on customers and understanding changing demands.	.365**	.240**	.156**	.270**	.334**	.412**	.375**	.305**	.295**	.360**
Our organisation has established mechanisms that harness the innovativeness of key individuals and teams to create value	.352**	.339**	.154**	.259**	.405**	.416**	.450**	.412**	.449**	.417**
Our organisation combines the knowledge with results to build a new products and / or services	.416**	.381**	.156**	.333**	.497**	.427**	.485**	.396**	.437**	.449**
Our organisation brings new products and/or services on a yearly basis	.358**	.359**	.124**	.293**	.388**	.363**	.391**	.393**	.412**	.408**
Our organisation culture supports transfer of best practices that leads to new developments	.411**	.365**	.169**	.318**	.459**	.447**	.527**	.421**	.432**	.452**
Our organization has all the facilities that enhance team work	.323**	.349**	.129**	.308**	.367**	.405**	.446**	.341**	.404**	.369**
Our organisation has the ability of speeding up creative ideas	.330**	.434**	.163**	.331**	.430**	.407**	.457**	.412**	.379**	.405**
Our organisation would develop new ideas from capturing achievements and failures	.368**	.365**	.170**	.368**	.465**	.459**	.509**	.395**	.406**	.427**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Appendix (9) Scree Plot of total survey components



The Scree plot represents the first five components loading represent 59% of total components variance.

Appendix (10) Multivariate Tests Table

Table (A-10-1) Between-Subjects SSCP Matrix

			SMEAN(OC)	SMEAN(OE)	SMEAN(OL)	SMEAN(OI)
Hypothesis	Intercept	OC	2005.341	2023.177	1902.116	1900.372
		OE	2023.177	2041.173	1919.034	1917.275
		OL	1902.116	1919.034	1804.204	1802.550
		OI	1900.372	1917.275	1802.550	1800.898
	KM	OC	158.151	164.110	179.089	166.791
		OE	164.110	186.942	203.173	188.021
		OL	179.089	203.173	231.613	210.513
		OI	166.791	188.021	210.513	202.180
Error		OC	92.048	34.152	28.501	30.053
		OE	34.152	86.186	58.933	49.271
		OL	28.501	58.933	141.654	75.135
		OI	30.053	49.271	75.135	106.526

Based on Type III Sum of Squares

Table (A-10-2) Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Intercept	Pillai's Trace	.972	4988.295(b)	4.000	567.000	.000	.972	19953.179	1.000
	Wilks' Lambda	.028	4988.295(b)	4.000	567.000	.000	.972	19953.179	1.000
	Hotelling's Trace	35.191	4988.295(b)	4.000	567.000	.000	.972	19953.179	1.000
	Roy's Largest Root	35.191	4988.295(b)	4.000	567.000	.000	.972	19953.179	1.000
OKM_1	Pillai's Trace	1.107	4.037	216.000	2280.000	.000	.277	872.073	1.000
	Wilks' Lambda	.165	5.973	216.000	2266.426	.000	.362	1287.028	1.000
	Hotelling's Trace	3.572	9.352	216.000	2262.000	.000	.472	2020.032	1.000
	Roy's Largest Root	3.178	33.543(c)	54.000	570.000	.000	.761	1811.314	1.000

a Computed using alpha = .05 , b Exact statistic

Appendix (11) Regression Estimates of factors

Simple Linear Regression- Run 1 (OC-KM)

Table (A-11-1a) Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
dimension0 1	Knowledge Management[a]		Enter

a. All requested variables entered.

b. Dependent Variable: Org Competitiveness

Table (A-11-1b) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.766[a]	.587	.586	.40684

a. Predictors: (Constant), Knowledge Management

Table (A-11-1c) ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	145.808	1	145.808	880.913	.000[a]
	Residual	102.788	621	.166		
	Total	248.596	622			

a. Predictors: (Constant), Knowledge Management
b. Dependent Variable: Org Competitiveness

Table (A-11-1d) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.254	.077		16.333	.000
	Knowledge Management	.673	.023	.766	29.680	.000

a. Dependent Variable: Org Competitiveness

Regression

Simple Linear Regression- Run 2 (OE-KM)

Table (A-11-2a) Variables Entered/ Removed[b]

Model	Variables Entered	Variables Removed	Method
dimension0 1	Knowledge Management	.	Enter

a. All requested variables entered.

b. Dependent Variable: Org Excellence

Table (A-11-2b) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.805[a]	.649	.648	.39304

a. Predictors: (Constant), Knowledge Management

Table (A-11-2c) ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	177.194	1	177.194	1147.025	.000[a]
	Residual	95.933	621	.154		
	Total	273.128	622			

a. Predictors: (Constant), Knowledge Management
b. Dependent Variable: Org Excellence

Table (A-11-2d) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.120	.074		15.099	.000
	Knowledge Management	.741	.022	.805	33.868	.000

a. Dependent Variable: Org Excellence

Regression

Simple Linear Regression- Run 3 (OL-KM)

Table (A-11-3a) Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
dimension0 1	Knowledge Management	.	Enter

a. All requested variables entered.

b. Dependent Variable: Org Learning

Table (A-11-3b) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.753[a]	.568	.567	.51014

a. Predictors: (Constant), Knowledge Management

Table (A-11-3c) ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	211.914	1	211.914	814.278	.000[a]
	Residual	161.353	620	.260		
	Total	373.267	621			

a. Predictors: (Constant), Knowledge Management

b. Dependent Variable: Org Learning

Table (A-11-3d) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.624	.096		6.486	.000
	Org Knowledge Management	.811	.028	.753	28.536	.000

a. Dependent Variable: Org Learning

Regression
Simple Linear Regression- Run 4 (OI-KM)

Table (A-11-4a) Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
dimension0 1	Knowledge Management	.	Enter

a. All requested variables entered.
b. Dependent Variable: Org Innovation

Table (A-11-4b) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.776[a]	.602	.602	.44756

a. Predictors: (Constant), Knowledge Management

Table (A-11-4c) ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	185.915	1	185.915	928.140	.000[a]
	Residual	122.790	613	.200		
	Total	308.705	614			

a. Predictors: (Constant), Knowledge Management

b. Dependent Variable: Org Innovation

Table (A-11-4d) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.796	.085		9.380	.000
	Knowledge Management	.763	.025	.776	30.465	.000

a. Dependent Variable: Org Innovation

Regression
Multiple Regression- (OC= f (KM, OE, OL, OI))

Table (A-11-5a) Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1 dimension0	Organisation Innovation, Knowledge Management, Organisation Learning, Organisation Excellence	.	Enter

a. All requested variables entered.
b. Dependent Variable: Org Competitiveness

Table (A-11-5b) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension0 1	.806[a]	.650	.647	.37652

a. Predictors: (Constant), Org Innovation, Knowledge Management, Org Learning, Org Excellence

Table (A-11-5c) ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	160.405	4	40.101	282.863	.000[a]
	Residual	86.479	610	.142		
	Total	246.884	614			

a. Predictors: (Constant), Org Innovation, Knowledge Management, Org Learning, Org Excellence
b. Dependent Variable: Org Competitiveness

Table (A-11-5d) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.793	.084		9.407	.000
	Knowledge Management	.340	.038	.387	8.918	.000
	Org Excellence	.330	.048	.345	6.834	.000
	Org Learning	-.011	.041	-.014	-.281	.779
	Org Innovation	.126	.046	.141	2.775	.006

a. Dependent Variable: Org Competitiveness

Appendix (12) Dimensional / Constructs Regression Analysis

Table (A-12-1) OC dimension regression coefficients analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.573	.116		4.946	.000
q11	Our organization has improved its ability to identify new services opportunities	.069	.026	.081	2.613	.009
q12	Our Organisation adopts quickly to unanticipated change	.053	.025	.070	2.175	.030
q13	Our organization can create a good profitable income for government with Return on Investment	-.019-	.018	-.027-	-1.034-	.302
q14	Our organization has the ability to react to customer demands	.020	.027	.023	.744	.457
q15	Our Organisation always streamline it processes	.105	.028	.132	3.685	.000
q16	Our organization has plans for future that would ensure sustainability of services	.156	.026	.201	5.994	.000
q17	Our organizational has analytical capabilities that leads to learning from mistakes	.159	.026	.230	6.217	.000
q18	Our organizational has a unique way in dealing with customers with intimacy	.017	.027	.022	.640	.522
q19	Our organizational has established unique values with its employees that are difficult to copy	.136	.024	.189	5.747	.000
q101	Our organisation has established high quality services / products with low cost and high speed of delivery	.100	.025	.133	3.929	.000

a. Dependent Variable: SMEAN(KM)

Table (A-12-2) OE dimension regression analysis coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
	(Constant)	.202	.099		2.041	.042
q31	Our organization leaders pinpoints the change needed and provide all necessary resources to make it happen	.147	.028	.178	5.181	.000
q32	Our organisation has established plans for facilitating the adaptation to change.	.130	.028	.155	4.697	.000
q33	Our organization continuously reviews its progress towards achieving strategic objectives.	.081	.027	.103	3.018	.003
q34	Our organisation ensure that employees knows their responsibility towards the customers and organization's objectives	-.011-	.026	-.014-	-.420-	.675
q35	Our organisation has close, long-term relationships with its partners designed to resolve quality-related problems	.044	.027	.051	1.625	.105
q36	Our organization continuously improves its operation through meeting best service delivery at best quality and best cost	.097	.027	.125	3.587	.000
q37	Our organization has effective communication between all the levels of management	.122	.024	.173	5.187	.000
q38	Our organization work on values that are reflected into the society and its ability to collaborate with other organizations	.086	.029	.097	2.957	.003
q39	Our organisation ensure compliance to customer needs through processes that are designed to deliver the right skills and capacities	.147	.031	.164	4.672	.000
q301	Our organization combined continuous environmental reviews intended to maintain or improve performance	.029	.028	.035	1.015	.310

a. Dependent Variable: SMEAN(KM)

Table (A-12-3) OL dimension regression analysis coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.061	.085		12.426	.000
q41	Our organisation employees feel free to speak their minds about what they have learned	-.034-	.028	-.046-	-1.206-	.228
q42	Our organization turns mistakes into constructive learning experiences	.176	.031	.230	5.742	.000
q43	Our organization encourages and cultivates multiple viewpoints and open productive debates	-.019-	.035	-.025-	-.546-	.585
q44	Our organization has the ability to breaks old patterns in order to experiment with different ways of organizing and managing daily work	.077	.029	.101	2.649	.008
q45	Our organisation conducts Lessons learned sessions	.128	.027	.187	4.717	.000
q46	Our organisation teams are recognized and rewarded for paradigm breaking solutions to problems	.087	.028	.119	3.113	.002
q47	Our organization employees learning is considered more of an investment than an expense	.068	.023	.103	2.919	.004
q48	Our organization has interaction sessions that enhances sharing of experiences	.064	.030	.091	2.170	.030
q49	Our organization has proper programs that close skill gaps and enhance proficiency	.091	.029	.133	3.130	.002
q401	Our organization involves personnel in important decisions	.058	.026	.085	2.188	.029

a. Dependent Variable: SMEAN(KM)

Table (A-12-3) OI dimension regression analysis coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.690	.093		7.380	.000
q51	Our organisation has clear social networks that supports innovative capabilities	.093	.027	.125	3.471	.001
q52	Our organisation has reward scheme based on the value of innovation	.072	.026	.108	2.820	.005
q53	Our organisation business results focus should be based on customers and understanding changing demands.	.042	.024	.054	1.764	.078
q54	Our organisation has established mechanisms that harness the innovativeness of key individuals and teams to create value	.109	.030	.135	3.624	.000
q55	Our organisation combines the knowledge with results to build a new products and / or services	.141	.031	.174	4.527	.000
q56	Our organisation brings new products and/or services on a yearly basis	.076	.025	.104	3.042	.002
q57	Our organisation culture supports transfer of best practices that leads to new developments	.099	.031	.128	3.236	.001
q58	Our organization has all the facilities that enhance team work	.003	.025	.004	.120	.905
q59	Our organisation has the ability of speeding up creative ideas	.036	.030	.049	1.201	.230
q501	Our organisation would develop new ideas from capturing achievements and failures	.121	.030	.156	4.015	.000

a. Dependent Variable: SMEAN(KM)

Appendix (A-12-4) Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	OC	158.151(a)	54	2.929	18.136	.000
	OE	186.942(b)	54	3.462	22.896	.000
	OL	231.613(c)	54	4.289	17.259	.000
	OI	202.180(d)	54	3.744	20.034	.000
Intercept	OC	2005.341	1	2005.341	12417.867	.000
	OE	2041.173	1	2041.173	13499.528	.000
	OL	1804.204	1	1804.204	7259.930	.000
	OI	1800.898	1	1800.898	9636.277	.000
OKM_1	OC	158.151	54	2.929	18.136	.000
	OE	186.942	54	3.462	22.896	.000
	OL	231.613	54	4.289	17.259	.000
	OI	202.180	54	3.744	20.034	.000
Error	OC	92.048	570	.161		
	OE	86.186	570	.151		
	OL	141.654	570	.249		
	OI	106.526	570	.187		
Total	OC	7813.941	625			
	OE	8260.768	625			
	OL	7217.210	625			
	OI	7200.003	625			
Corrected Total	OC	250.199	624			
	OE	273.128	624			
	OL	373.267	624			
	OI	308.705	624			

a R Squared = .632 (Adjusted R Squared = .597)
b R Squared = .684 (Adjusted R Squared = .655)
c R Squared = .621 (Adjusted R Squared = .585)
d R Squared = .655 (Adjusted R Squared = .622)

Appendix (13) Tables of Communalities

Communalities

	Initial	Extraction
SMEAN(Q11)	1.000	.509
SMEAN(Q12)	1.000	.545
SMEAN(Q13)	1.000	.389
SMEAN(Q14)	1.000	.527
SMEAN(Q15)	1.000	.591
SMEAN(Q16)	1.000	.577
SMEAN(Q17)	1.000	.615
SMEAN(Q18)	1.000	.559
SMEAN(Q19)	1.000	.561
SMEAN(Q101)	1.000	.521
SMEAN(Q21)	1.000	.468
SMEAN(Q22)	1.000	.693
SMEAN(Q23)	1.000	.729
SMEAN(Q24)	1.000	.600
SMEAN(Q25)	1.000	.649
SMEAN(Q26)	1.000	.606
SMEAN(Q27)	1.000	.589
SMEAN(Q28)	1.000	.538
SMEAN(Q29)	1.000	.665
SMEAN(Q201)	1.000	.649
SMEAN(Q31)	1.000	.562
SMEAN(Q32)	1.000	.554
SMEAN(Q33)	1.000	.577
SMEAN(Q34)	1.000	.626
SMEAN(Q35)	1.000	.563
SMEAN(Q36)	1.000	.642
SMEAN(Q37)	1.000	.600
SMEAN(Q38)	1.000	.576
SMEAN(Q39)	1.000	.565
SMEAN(Q301)	1.000	.551
SMEAN(Q41)	1.000	.701
SMEAN(Q42)	1.000	.609
SMEAN(Q43)	1.000	.709
SMEAN(Q44)	1.000	.595
SMEAN(Q45)	1.000	.616
SMEAN(Q46)	1.000	.609
SMEAN(Q47)	1.000	.529
SMEAN(Q48)	1.000	.650
SMEAN(Q49)	1.000	.641
SMEAN(Q401)	1.000	.610
SMEAN(Q51)	1.000	.579
SMEAN(Q52)	1.000	.630
SMEAN(Q53)	1.000	.543
SMEAN(Q54)	1.000	.604
SMEAN(Q55)	1.000	.633
SMEAN(Q56)	1.000	.523
SMEAN(Q57)	1.000	.652
SMEAN(Q58)	1.000	.576
SMEAN(Q59)	1.000	.626
SMEAN(Q501)	1.000	.632

Extraction Method: Principal Component Analysis.

Appendix (14) Rotated Component Matrix(a)

	Component					Communalities
	1	2	3	4	5	
Our organisation has improved its ability to identify new services opportunities				.482	.495	.513
Our Organisation adopts quickly to unanticipated change					.623	.504
Our organisation has the ability to react to customer demands					.636	.473
Our Organisation always streamline it processes					.618	.611
F			.409	.424		.529
Our organisational has analytical capabilities that leads to learning from mistakes					.563	.619
Our organisational has a unique way in dealing with customers with intimacy					.687	.624
Our organisational has established unique values with its employees that are difficult to copy					.549	.550
Our organisation has established high quality services / products with low cost and high speed of delivery					.552	.542
Our organisation top management appreciates the market value of human capital knowledge	.407					.474
Our organisation has clearly defined and documented knowledge management strategies			.671			.695
Our organisation has implemented knowledge management Policies to improve its service delivery			.726			.705
Our organisation is acquiring knowledge while modifying its behaviors accordingly			.631			.613
Our organisation has a listing of all Knowledge Assets inventory.			.638			.647

Our organisation managed to build up an ability to capture knowledge which is used to develop specific programs			.703			.653
Our organisational decision making process depends on knowledge transfer			.523			.569
Our organisation always shares its knowledge with its partners			.507			.534
Our organisation effectively manage it knowledge assets to generate new ideas			.555			.666
Our organisation has a clear process of capturing the collective expertise and intelligence		.413	.478			.633
Our organisation leaders pinpoints the change needed and provide all necessary resources to make it happen				.409		.561
Our organisation has established plans for facilitating the adaptation to change.				.409		.546
Our organisation continuously reviews its progress towards achieving strategic objectives.				.561		.572
Our organisation ensure that employees knows their responsibility towards the customers and organisation's objectives				.581		.581
Our organisation has close, long-term relationships with its partners designed to resolve quality-related problems				.577		.558
Our organisation continuously improves its operation through meeting best service delivery at best quality and best cost				.522		.628
Our organisation has effective communication between all the levels of management	.493					.569
Our organisation work on values that are reflected into the society and its ability to collaborate with				.539		.540

other organizations						
Our organisation ensure compliance to customer needs through processes that are designed to deliver the right skills and capacities				.468		.569
Our organisation combined continuous environmental reviews intended to maintain or improve performance				.460		.556
Our organisation employees feel free to speak their minds about what they have learned	.771					.680
Our organisation turns mistakes into constructive learning experiences	.594					.614
Our organisation encourages and cultivates multiple viewpoints and open productive debates	.737					.707
Our organisation has the ability to breaks old patterns in order to experiment with different ways of organizing and managing daily work	.579					.573
Our organisation conducts Lessons learned sessions	.459	.490				.604
Our organisation teams are recognized and rewarded for paradigm breaking solutions to problems	.471	.512				.611
Our organisation employees learning is considered more of an investment than an expense	.517					.521
Our organisation has interaction sessions that enhances sharing of experiences	.562	.411				.611
Our organisation has proper programs that close skill gaps and enhance proficiency	.521	.456				.652
Our organisation involves personnel in important decisions	.699					.642
Our organisation has clear social networks that supports innovative	.445	.493				.559

capabilities						
Our organisation has reward scheme based on the value of innovation	.480	.518				.636
Our organisation business results focus should be based on customers and understanding changing demands.				.524		.418
Our organisation has established mechanisms that harness the innovativeness of key individuals and teams to create value		.538				.595
Our organisation combines the knowledge with results to build a new products and / or services		.568				.639
Our organisation brings new products and/or services on a yearly basis		.616				.557
Our organisation culture supports transfer of best practices that leads to new developments		.593				.680
Our organisation has all the facilities that enhance team work	.450	.514				.558
Our organisation has the ability of speeding up creative ideas		.542				.613
Our organisation would develop new ideas from capturing achievements and failures		.534				.594
Eigen values	6.819	6.019	5.986	5.080	4.994	
% of variance explained	13.916	12.286	112.216	10.367	10.191	

Extraction Method: Principal Component Analysis , Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 12 iterations

Appendix (15) Model Fit Tests

Table (A-15-1) Guideline set for Overall Model Fit

GOF Criterion	Value Range	Acceptable Level
Absolute Fit		
Chi-square	Tabled value	Compares with tabled value for given df
Goodness of fit (GFI)	0 (no fit) to 1 (perfect fit)	Value close to 0.90 reflects a good fit
Adjusted GFI (AGFI)	0 (no fit) to 1 (perfect fit)	Value > 0.90 reflects a good model fit
Root-mean-square error of approximation (RMSEA)	<0.10 <0.05 reflects very good fit	<0.10 reflects good fit <0.01 reflects outstanding fit
Normed fit index (NFI)	0 (no fit) to 1 (perfect fit)	Value close to 0.90 reflects a good fit
Non-normed fit index (NNFI)	0 (no fit) no upper bound value	Value close to 0.90 reflects a good fit
Comparative Fit		
Comparative fit index (CFI)	0 (no fit) to 1 (perfect fit)	Value close to 0.90 reflects a good fit
Incremental fit index (IFI)	0 (no fit) to 1 (perfect fit)	Value close to 0.90 reflects a good fit
Relative fit index (RFI)	0 (no fit) to 1 (perfect fit)	Value close to 0.90 reflects a good fit
Parsimonious Fit		
Parsimonious goodness of **fit index (PGFI)**	0 (no fit) to 1 (perfect fit)	Compares values in alternative models
Parsimonious normed fit index (PNFI)	0 (no fit) to 1 (perfect fit)	Compares values in alternative models

(Source: Schumacker and Lomax, 2004)

Model run-1 detailed results

Variable counts for Model run-1

Number of variables in your model: 105
Number of observed variables: 50
Number of unobserved variables: 55
Number of exogenous variables: 51
Number of endogenous variables: 54

Computation of degrees of freedom (Default model) for Model run-1

Number of distinct sample moments: 1325
Number of distinct parameters to be estimated: 102
Degrees of freedom (1325 - 102): 1223

Result (Default model)

The model is probably unidentified. In order to achieve identifiability, it will probably be necessary to impose 3 additional constraints.

Table (A-15-2a) **CMIN for Model run-1**

Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	1325	.000	0		
Independence model	50	20742.763	1275	.000	16.269

Table (A-15-2b) **Baseline Comparisons for Model run-1**

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table (A-15-2c) **Parsimony-Adjusted Measures for Model run-1**

Model	PRATIO	PNFI	PCFI
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Table (A-15-2d) **NCP for Model run-1**

Model	NCP	LO 90	HI 90
Saturated model	.000	.000	.000
Independence model	19467.763	19004.519	19937.422

Table (A-15-2e) **FMIN for Model run-1**

Model	FMIN	F0	LO 90	HI 90
Saturated model	.000	.000	.000	.000
Independence model	33.242	31.198	30.456	31.951

Table (A-15-2f) **RMSEA for Model run-1**

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	.156	.155	.158	.000

Table (A-15-2e) **AIC for Model run-1**

Model	AIC	BCC	BIC	CAIC
Saturated model	2650.000	2885.864		
Independence model	20842.763	20851.664		

Table (A-15-2g) **ECVI for Model run-1**

Model	ECVI	LO 90	HI 90	MECVI
Saturated model	4.247	4.247	4.247	4.625
Independence model	33.402	32.659	34.155	33.416

Table (A-15-2g) **HOELTER for Model run-1**

Model	HOELTER .05	HOELTER .01
Independence model	41	42

Model run-2 detailed results

Table (A-15-3a) **Variable counts for Model run-2**

	85
Number of variables in your model:	
Number of observed variables:	40
Number of unobserved variables:	45
Number of exogenous variables:	41
Number of endogenous variables:	44

Table (A-15-3b) **Computation of degrees of freedom (Default model) for Model run-2**

Number of distinct sample moments:	860
Number of distinct parameters to be estimated:	83
Degrees of freedom (860 - 83):	777

Table (A-15-3c) **Result (Default model)**

Model run-2 is probably unidentified. In order to achieve identifiability, it will probably be necessary to impose 4 additional constraints.

Table (A-15-3d) **Baseline Comparisons for Model run-2**

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table (A-15-3e) **Parsimony-Adjusted Measures for Model run-2**

Model	PRATIO	PNFI	PCFI
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Table (A-15-3f) **NCP for Model run-2**

Model	NCP	LO 90	HI 90
Saturated model	.000	.000	.000
Independence model	15370.459	14960.407	15786.901

Table (A-15-3g) **FMIN for Model run-2**

Model	FMIN	F0	LO 90	HI 90
Saturated model	.000	.000	.000	.000
Independence model	25.946	24.632	23.975	25.300

Table (A-15-3h) **RMSEA for Model run-2**

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	.173	.171	.176	.000

Table (A-15-3i) **AIC for Model run-2**

Model	AIC	BCC	BIC	CAIC
Saturated model	1720.000	1840.961		
Independence model	16270.459	16276.085		

Table (A-15-3j) **ECVI for Model run-2**

Model	ECVI	LO 90	HI 90	MECVI
Saturated model	2.756	2.756	2.756	2.950
Independence model	26.074	25.417	26.742	26.083

Table (A-15-3k) **HOELTER for Model run-2**

Model	HOELTER .05	HOELTER .01
Independence model	35	36

Model run-3 detailed results

Model 3-run–represented and drawn in AMOS

Number of variables in your model:	107
Number of observed variables:	49
Number of unobserved variables:	58
Number of exogenous variables:	54
Number of endogenous variables:	53

Computation of degrees of freedom (Default model) for model run-3

Number of distinct sample moments:	819
Number of distinct parameters to be estimated:	84
Degrees of freedom (819 - 84):	735

Result (Default model) for model run-3

Model run-3 is probably unidentified. In order to achieve this targeted identification, it will probably be necessary to impose additional constraint(s).

Model 3-run–represented and drawn in AMOS (after PCA) is conducted

Number of variables in your model:	87
Number of observed variables:	39
Number of unobserved variables:	48
Number of exogenous variables:	44
Number of endogenous variables:	43

As seen the number of variables whether exogenous or endogenous have been reduced, which supports the accuracy results.

Independence model	39	15820.236	780	.000	20.282

Table (A-15-4a) Parsimony-Adjusted Measures for model generalization for Model 3-run

Model	PRATIO	PNFI	PCFI
Default model	.962	.334	.354
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Table (A-15-4b) independent samples test for Model 3 – run

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	T	df	Sig. (2-tailed)
Org Competitiveness	Equal variances assumed	.065	.799	.973	614	.331
	Equal variances not assumed			.975	575.487	.330
Org Knowledge Management	Equal variances assumed	.025	.875	-.509-	612	.611
	Equal variances not assumed			-.509-	570.963	.611
Org Excellence	Equal variances assumed	3.072	.080	.199	612	.843
	Equal variances not assumed			.201	589.985	.841
Org Learning	Equal variances assumed	2.059	.152	2.187	611	.029
	Equal variances not assumed			2.164	542.080	.031
Org Innovation	Equal variances assumed	.145	.704	.067	605	.947
	Equal variances not assumed					

Table (A-15-4c) NPAR and CMIN tests for Model 3-run

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	99	13530.555	1226	.000	11.036
Saturated model	1325	.000	0		
Independence model	50	20742.763	1275	.000	16.269

Table (A-15-4d) NCP for Model 3-run

Model	NCP	LO 90	HI 90
Default model	12304.555	11933.909	12681.680
Saturated model	.000	.000	.000
Independence model	19467.763	19004.519	19937.422

Table (A-15-4e) FMIN for Model 3-run

Model	FMIN	F0	LO 90	HI 90
Default model	21.684	19.719	19.125	20.323
Saturated model	.000	.000	.000	.000
Independence model	33.242	31.198	30.456	31.951

Table (A-15-4f) AIC for Model 3-run

Model	AIC	BCC	BIC	CAIC
Default model	13728.555	13746.178		
Saturated model	2650.000	2885.864		
Independence model	20842.763	20851.664		

Table (A-15-4g) ECVI for Model 3-run

Model	ECVI	LO 90	HI 90	MECVI
Default model	22.001	21.407	22.605	22.029
Saturated model	4.247	4.247	4.247	4.625
Independence model	33.402	32.659	34.155	33.416

Table (A-15-4h) HOELTER for Model 3-run

Model	HOELTER .05	HOELTER .01
Default model	61	62
Independence model	41	42

Table (A-15-4i) Summary of incremental fit indexes Model 3- run

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.348	.322	.370	.343	.368

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Model run-4 detailed results

Table (A-15-5a) NCP for Model 4-run

Model	NCP	LO 90	HI 90
Default model	9610.687	9281.766	9946.129
Saturated model	.000	.000	.000
Independence model	19084.808	18626.319	19549.708

Table (A-15-5b) NPAR and CMIN tests for Model 4-run

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	102	10782.687	1172	.000	9.200
Saturated model	1274	.000	0		
Independence model	49	20309.808	1225	.000	16.579

Table (A-15-5c) Parsimony-Adjusted Measures for model generalization for Model 4-run

Model	PRATIO	PNFI	PCFI
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Table (A-15-5d) HOELTER for Model 4-run

Model	HOELTER .05	HOELTER .01
Default model	73	75
Independence model	41	42

Table (A-15-5e) summary of incremental fit indexes Model 4- run

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.469	.445	.498	.474	.496
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table (A-15-5f) FMIN for Model 4-run

Model	FMIN	F0	LO 90	HI 90
Default model	17.280	15.402	14.875	15.939
Saturated model	.000	.000	.000	.000
Independence model	32.548	30.585	29.850	31.330

Table (A-15-5g) FMIN for Model 4-run

Model	FMIN	F0	LO 90	HI 90
Saturated model	.000	.000	.000	.000
Independence model	25.353	24.103	23.453	24.763

Table (A-15-5h) AIC for Model 4-run

Model	AIC	BCC	BIC	CAIC
Default model	10986.687	11004.457		
Saturated model	2548.000	2769.951		
Independence model	20407.808	20416.344		

Table (A-15-5i) AIC for Model 4-run

Model	AIC	BCC	BIC	CAIC
Saturated model	1638.000	1750.192		
Independence model	15898.236	15903.578		

Table (A-15-5j) ECVI for Model 4-run

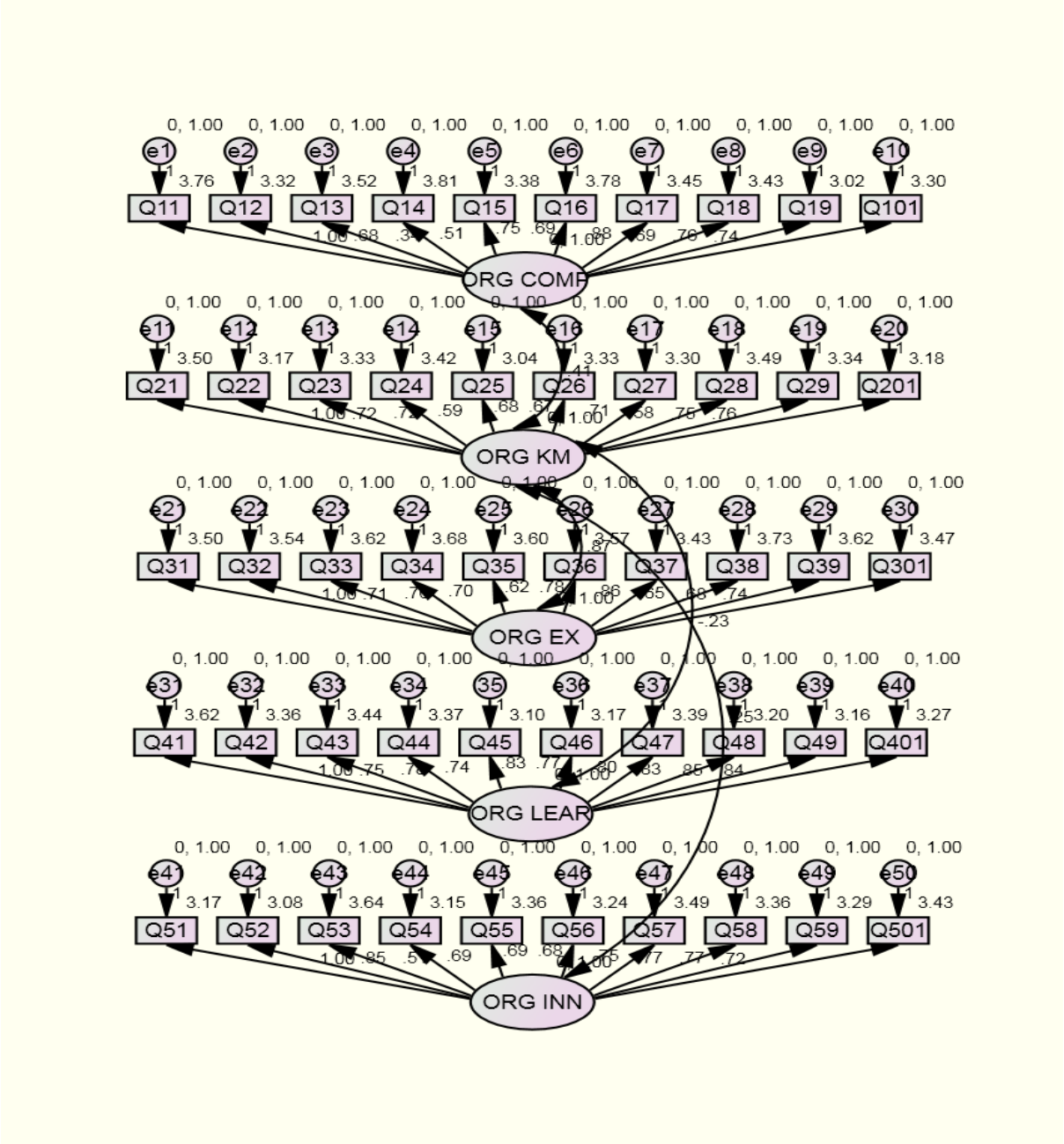
Model	ECVI	LO 90	HI 90	MECVI
Default model	17.607	17.080	18.144	17.635
Saturated model	4.083	4.083	4.083	4.439
Independence model	32.705	31.970	33.450	32.719

Table (A-15-5k) Parsimony-Adjusted Measures for model generalization for Model 4-run

Model	PRATIO	PNFI	PCFI
Default model	.957	.449	.475
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Model run-5 detailed results

Figure (A-15-1) CFA Model run-5 proposed for two sided arrow from and to KM with each of the four prevalent variables.



For Model 5-run

Number of distinct sample moments: 1325
Number of distinct parameters to be estimated: 99
Degrees of freedom (1325 - 99): 1226

This reflect that the minimum was achieved where
For Model 5-run gives
Chi-square = 13530.555
Degrees of freedom = 1226
Probability level = .000

Model 5 – run –represented and drawn in AMOS

Number of variables in the model: 105
Number of observed variables: 50
Number of unobserved variables: 55
Number of exogenous variables: 55
Number of endogenous variables: 50

Table (A-15-6a) represent the NPAR and CMIN tests for Model 5-run

Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	1274	.000	0		

Table (A-15-6b) NCP for Model 5-run

Model	NCP	LO 90	HI 90
Saturated model	.000	.000	.000
Independence model	15040.236	14634.793	15452.064

Table (A-15-6c) ECVI for Model 5-run

Model	ECVI	LO 90	HI 90	MECVI
Saturated model	2.625	2.625	2.625	2.805
Independence model	25.478	24.828	26.138	25.487

Table (A-15-6d) HOELTER for Model 5-run

Model	HOELTER .05	HOELTER .01
Independence model	34	35