

Employee Perception of Impact of Knowledge Management Processes on Public Sector Performance

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Abstract

Purpose: The application of knowledge management is critical to public sector firm as it is to private sector firm. However, despite its significance, the academic enquiry of knowledge management in public sector is at its nascent stage. This forms the motivation of the present work, which attempts to analyze and understand the intricate relationship between knowledge management (KM) processes and public sector firm performance in terms of operational, quality and innovation performance.

Design/methodology/approach: A comprehensive KM processes-performance framework consisting of seven constructs (four constructs of KM processes and three constructs of KM performance) and their underlying factors was developed through an extensive literature review. The employee perceptions of these seven constructs were captured on a 5-point Likert scale using a country wide survey on the United Arab Emirates public sector. The 270 valid responses captured was then used to, first validate the KM framework, and then test the hypothesized relationships between KM processes and KM performance.

Findings: The findings shows that all four KM processes (knowledge creation, knowledge capture and storage, knowledge sharing, and knowledge application and use) had a positive and significant impact on operational, quality and innovation performance of public sector in the UAE.

Research limitations/implications: The findings confirm the validity and reliability of all the seven constructs and their underlying factors as well as the assessment framework. Overall, this study fills a gap in the literature about applying/implementing a KM framework for the public sector and therefore significantly contribute towards the theoretical advancement of the field. However, the study does acknowledge the use of perceptual measures of individual employees as a limitation instead of more objective measures to capture the impact KM processes on KM performance.

Practical implications: The strong and significant impact of KM processes on firm performance is expected to provide the impetus for practitioners and policymakers to implement and leverage from KM processes improve firm performance in the public sector.

Originality/value: A comprehensive development, validation and assessment of a KM framework for the public sector has not been attempted previously anywhere let alone UAE and hence constitutes the novelty of this work.

Keywords: Knowledge management, Firm performance, Public sector organizations, United Arab Emirates

Paper type: Research paper

1. Introduction

Knowledge management (KM) as an academic and practice-based discipline has witnessed significant interest in recent years (Mariano & Awazu, 2016). However, the focus of most of these studies has been in the private sector vis-à-vis the public sector (Oluikpe, 2012, Ringel-Bickelmaier & Ringel, 2010). Moreover, a structured literature review of KM in the public conducted by Massaro et al. (2015) shows that the existing KM studies is fragmented and failed to develop a cohesive body of knowledge. This scattered and limited understanding of KM in the public sector (Friis, 2002; Cong & Pandya, 2003; Oluikpe, 2012) is a major concern given that knowledge is as critical a resource to public sector as it is to private sector (Willem & Buelens, 2007; Massaro et al., 2015) and that knowledge management for the public sector is no longer a choice but an imperative if the respective country's public sector wishes to survive in the unfolding era of privatization, liberalization, and globalization (Misra, 2007). Today, public sector entities are forced to move away from traditional, bureaucratic approaches to more managerial ones (Sandhu et al., 2011) because citizens now expect the same levels and standards of service from government entities that they receive from the private sector. For instance, all too often, citizens complain about the waiting times at government departments, having to go to multiple government agencies for one service, as well as a general lack of convenience in accessing government services. Massaro et al. (2015) highlighted that public sector entities face greater pressures for representativeness, accountability and responsiveness than private sector firms. Therefore, governments are at risk of falling behind unless they start establishing strong KM goals and strategies as a potential way to address these challenges (OECD, 2007). Overall, the need and significance of KM for the public sector are overwhelming. Therefore, the question now is no longer that of whether public sector need KM, but rather how they can effectively reap benefits from KM.

The central tenet of KM is to ensure efficient, effective and extensive implementation of 'KM processes' namely knowledge creation, knowledge capture and storage, knowledge sharing and knowledge application and use, to achieve the desired organizational performance outcomes (Von Krogh, 1998; Alavi & Leidner, 2001). Unlike the private sector where the main objective is to maximize revenue and profits, the three important pillars of public sector performance are innovation, quality of service delivery and operational efficiency of services (Cong & Pandya, 2003). Unfortunately, to date, none of the studies in the literature have comprehensively assessed the impact of KM processes on these three pillars of public sector performance, though there have been few studies in public sector that looked at the impact of KM processes on human resource related aspects such as job fit and employee motivation (Kasim, 2008). Moreover, the relatively limited number of studies that have investigated KM processes in the public sector have been largely fragmented and ad-hoc, investigating only a sub-set of issues in isolation such as knowledge creation (Purcarea, 2013; Akehurst et al., 2011) and knowledge sharing (Xu et al., 2011; Syed-Ikhsan & Rowland, 2004) rather than considering all aspects together in a holistic manner. A comprehensive understanding of the relationships between KM processes and performance would enable practitioners and policymakers to prioritise the implementation of KM processes in line with public sector performance goals (considering all three performance aspects). Furthermore, it would also enable public sector to identify and make improvements (efficiency and effectiveness of implementation) to those existing KM processes found to be lagging in delivering the desired performance.

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3 The above gap in the literature formed the motivation of this research, which aims to develop,
4 validate and apply a multidimensional KM **processes**-performance framework for the public sector
5 covering all key KM **processes** and performance.
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7 The specific objectives are as follows:

- 8 1. To develop the relevant constructs for KM **processes** and performance for the public sector.
- 9 2. To develop a comprehensive KM **processes**-performance framework that captures the
10 interrelationships between the constructs.
- 11 3. To empirically validate the KM framework and test the relevant hypotheses proposed in the
12 study.
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15 The United Arab Emirates (UAE) was carefully selected for this KM investigation because the
16 relevance of the study would be much greater for countries who, like the UAE, are trying to shift
17 towards a knowledge-based economy from an oil-based economy in the wake of declining oil prices.
18 Also, the UAE is one of the few countries in the region that have given strategic importance to KM
19 for its social and economic development (Al Mansouri, Singh, & Khan, 2018; Siddique, 2012).
20 Moreover, the UAE has been a pioneer in developing KM initiatives as part of its 2021 vision (DSG,
21 2014) and to date has made great progress towards this goal, which is reflected by the fact that UAE
22 was ranked 1st in the Arab world and 42nd overall in the knowledge economy index created by the
23 World Bank (DSG, 2014). Therefore, the UAE provides a perfect context for examining the
24 significance/potential of KM **processes** implementation in improving public sector performance.
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27 The rest of this paper is structured as follows. In the next section, we investigate the fragmented KM
28 studies in the public sector, including the UAE, in conjunction with KM studies in the private sector in
29 order to develop the relevant KM constructs for the public sector. In the third section, a
30 comprehensive KM framework and related hypotheses for the study are proposed. The fourth
31 section explains the research methodology undertaken in this study. In the fifth section, analysis and
32 findings of the study including validation of the constructs and framework and hypotheses test
33 results are provided. The final section discuss the study's findings and their implications along with
34 limitations and recommendations for future research.
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38 **2. Developing KM constructs and items for the public sector**

39 Though most of the earlier KM studies in the public sector are narrow in scope, the fragmented
40 contributions of these various studies, when considered together, have provided many critical
41 aspects necessary for the development of a comprehensive KM **processes**-performance framework
42 for the public sector. However, given that the private sector has seen more significant advancement
43 in KM than the public sector, we also reviewed KM studies in the private sector to identify important
44 aspects that can be carefully adopted by the public sector. This is further justified by the fact that
45 public sector are becoming more closely aligned to the private sector to ensure that they are getting
46 the full value of their investments and are effectively monitoring and measuring their performance
47 (Al-Raisi & Al-Khour, 2010).
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50 A comprehensive review of published studies in KM from leading databases such as SCOPUS, Web of
51 Science, Elsevier, Emerald and Science Direct was carried out to identify the important aspects of the
52 knowledge management framework. The relevant KM constructs and underlying factors/items for
53 the public sector identified from the literature are provided in Table 1. Though it can be argued that
54 a host of other constructs and items could be found in the KM literature, no other constructs and
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underlying items appeared to be as consistent and relevant in the public sector than those given in Table 1.

2.1. KM Processes

KM processes are fundamental actions that an organization performs in processing and manipulating its knowledge resources (Holsapple & Joshi, 2000). Some authors have referred to them as KM activities, while others have called them KM tasks or KM processes, but regardless of what they are referred to, they conceptually represent the same thing. They make up the central components of the KM framework because they inform the practitioners of the major activities that should be undertaken to operate successfully with their available knowledge resources. There are several approaches to classifying KM processes. One way of describing KM processes is by dividing them into four key phases, namely, knowledge creation, knowledge capture and storage, knowledge sharing, and knowledge application and use (McAdam & Reid, 2000).

Insert Table 1

2.1.1. Knowledge creation

This phase refers to the firm's ability to generate innovative ideas and solutions (Marakas, 1999). The creation of knowledge resources does not occur in abstraction from the presently available knowledge and capabilities of the firm (Alavi & Leidner, 2001). The creation of knowledge across functional boundaries requires the capability to generate new applications from existing knowledge and to exploit the unexplored potential of new skills. Nonaka's (1994) dynamic theory of organizational knowledge creation provides a theoretical backdrop against which to conceptualize the knowledge creation process. According to Nonaka (1994), organizational knowledge creation is a more wide-ranging and dynamic concept", and it is described as the interplay between tacit and explicit knowledge. Locke et al. (1997) highlighted the importance of involving employees and providing opportunities for them to voice their opinions and suggestions through participative decision-making processes for generating new ideas. However, this involves not only the creation of new knowledge from scratch but also the reconfiguration of existing pieces of knowledge to create new knowledge (Lynn et al., 1996). On this issue, Chong et al. (2011) found that employees who work together in a team are more efficient at creating new knowledge. Similarly, brainstorming sessions are also found to be effective for generating new ideas (Hutchinson & Quintas, 2008). Furthermore, reward systems established to acknowledge new ideas were found to be successful in motivating employees (Altinay et al., 2008).

2.1.2 Knowledge capture and storage

Studies have shown that even if a firm creates new knowledge, it may not necessarily result in storage (Argote et al., 1990). Therefore, it is important to capture such knowledge and make it available for the organization in the future (Stein & Zwass, 1995). Also, it is important for organizations to capture both types of knowledge: explicit and tacit. The capture of explicit knowledge is the systematic approach of gathering, organizing, and refining information in a way that makes information easy to find, and facilitates learning and problem-solving (Dalkir, 2005). For

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3 example, explicit knowledge about standardized work can be easily captured in writing. The capture
4 of tacit knowledge is the process of collecting information about the experiences and expertise of
5 the individuals in an organization, and making it available to anyone who needs it (Dalkir, 2005).
6 However, some tacit knowledge (e.g., innovation and creativity) cannot be easily captured
7 (Moorman & Miner, 1997). Therefore, knowledge capture cannot be considered as a purely
8 mechanistic “add-on” because it also involves the discovery, organization, and integration of
9 knowledge into the “fabric” of the organization. Knowledge has to be captured and codified in such
10 a way that it can become a part of the existing knowledge base of the organization. Each
11 organization has a history which provides a backdrop for the growth and evolution of the
12 organization. Each organization also has a memory. The embodiment of the organizational memory
13 is the experience of its employees combined with the tangible data and knowledge stores within the
14 organization (Walsh & Ungson, 1991). Now, with increasing advancements in technology,
15 organizations can easily codify, digitalize, and securely store knowledge with redundancy. Since
16 knowledge is not static, it is important to delete knowledge that is obsolete and replace it with new
17 knowledge to ensure that knowledge repositories are up to date (Wong & Aspinwall, 2005). Also,
18 employee willingness is just as important as codification, since storing knowledge is often considered
19 as an additional responsibility by employees.
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24 **2.1.3 Knowledge sharing**

25 In a knowledge-based economy, knowledge sharing is increasingly viewed as critical to
26 organizational effectiveness (Quigley et al., 2007), especially for those seeking to gain a competitive
27 edge over others (Felin & Hesterly, 2007). It can be defined as the “activities of transferring or
28 disseminating knowledge from one person, group or organization to another” (Lee, 2001). Studies
29 have argued that knowledge sharing among employees significantly impact the performance of both
30 public and private sector organizations (Al Shaima, Singh, Farouk & Sohal, 2016; Silvi & Cuganesan,
31 2006; Xu et al., 2011). According to Al Hussain et al. (2012), governments’ ability to enhance services
32 depends greatly on knowledge sharing across the organizational spectrum.
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35 Knowledge sharing involves sharing of both tacit and explicit knowledge. While the latter can be
36 shared in formal, systematic language among employees (Nonaka & Takeuchi, 1995) such as through
37 the intranet, electronic email, and shared databases, the former poses a challenge for organizations
38 for two reasons. First, employees’ tacit knowledge, which is personal and context-specific, is by its
39 nature very difficult to transfer. Second, tacit knowledge sharing is typically voluntary/non-
40 compulsory (Lin et al., 2008). Therefore, in the case of tacit knowledge sharing, employees should be
41 willing to share their knowledge with colleagues, which can be difficult. Gore and Gore (1999)
42 highlighted that the interaction which takes place within a team environment forms a kind of
43 foundation for the effective externalization of an individual’s tacit knowledge into organizational
44 knowledge. Arnold et al. (2000) have suggested that firms should encourage collaborative problem-
45 solving and provide opportunities for employees to share their tacit knowledge with each other.
46 Therefore, organizations should arrange meeting sessions where employees are free to share their
47 knowledge, ideas, and information with others (Coyte et al., 2012), as well as promote informal face-
48 to-face social interactions to encourage the sharing of tacit knowledge (Chong et al., 2011). The
49 evidence in the literature so far suggests that it is harder to share knowledge within public sector
50 organizations because most people associate knowledge with power and potential promotion
51 opportunities (Liebowitz & Chen, 2003).
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56 **2.1.4 Knowledge application and use**

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3 Knowledge becomes important when it is used and applied to create value for an organization.
4 Knowledge application and use is the process of using knowledge for a purpose; this occurs when
5 knowledge is put into action for decision-making or policy-making. Employees learn through
6 experience about how to deal with types of enquiries more efficiently. For instance, the frequent use
7 of certain kinds of information can help employees locate this information more quickly as they
8 become aware of the location in which the information resides. Knowledge is useless if it is not
9 utilized. This implies that the other capabilities of a firm in terms of creating, storing, and sharing
10 knowledge resources are irrelevant if the firm cannot apply and use the original knowledge
11 resources efficiently (Mahmoudsalehi et al., 2012). People do not just passively receive knowledge;
12 rather, they actively interpret it to fit with their own situations and perspectives. The utilization of
13 knowledge increases one's expertise in a domain of action, and a user therefore becomes an expert
14 through repetitive practice. An employee's capability of utilizing a relevant knowledge base in
15 decision-making and problem-solving situations allows a firm to respond more effectively to
16 environmental changes. Organizations should therefore encourage employees to use and apply what
17 they know and what they have learned, and to use or combine accessible information from the
18 organization's knowledge repository to both solve existing problems and to come up with new
19 products and services to bolster the organization's competitive advantage (Chan & Chao, 2008).
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24 **2.2 Public sector performance**

25 Performance benefits/improvement of KM processes is critical to justify investment in KM
26 **processes**. However, for firms to assess the performance improvement from KM **processes**'
27 implementation, they first need to devise and operationalize performance measures. Performance
28 measures allow firms to see evaluate and report performance, identify problems and bottlenecks,
29 set new objectives and targets, determine future courses of action and facilitate internal and
30 external benchmarking (Gunasekaran et al. 2004). Bond (1999) stated that performance
31 measurement would indicate whether a company should continue with its current strategy or make
32 adjustments.
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35 The precise measurement of benefits and progress regarding KM implementation is of the utmost
36 importance for an organization to ensure that the overall objectives of the KM exercise are being
37 fulfilled. Many organizations are embracing KM **processes**, but few of them are able to implement
38 them successfully to see the benefits.
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41 In the case of public sector performance, the three traditional pillars are innovation, quality of
42 service delivery and operational efficiency of services (Cong & Pandya, 2003). These three important
43 pillars of public sector performance are re-iterated by a collaborative study on government
44 performance by the UAE government in association with Deloitte (TGS, 2013).
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46 **2.2.1 Innovation Performance**

47 Innovation can be defined as a process that directly connects new ideas to the development of a
48 newly introduced product, process, or service (Aboelmaged, 2012). Similarly, West (2002) defines
49 innovation as new or improved methods of producing, creating, and providing services, as well as
50 improving ways in which to work more productively. More specifically, innovation in the public
51 sector can be defined as the 'the introduction of new elements into a public service—in the form of
52 new knowledge, a new organization, and/or new management or procedural skills, which represents
53 discontinuity with the past' (De Vries et al., 2015). This definition also implies that innovation is not
54 merely about generating new ideas, but that such skills also should be exercised into practice.
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Evidence from the literature illustrates the importance of KM in bolstering a firm's innovative capabilities (Chang & Lee, 2007; Tseng & Hung, 2011). For instance, Cantner et al. (2011) have investigated innovative companies and identified that KM is a critical factor contributing to their success. Inkinen et al. (2015) found knowledge management to have a positive impact on innovation performance in the Finnish private sector. Recent studies in developed countries have shown that innovation in the public sector is more important than it may be in the private sector (EPSIS, 2012). Developed countries are using innovation in the public sector as a means to address growing budgetary pressures, and for meeting new societal demands. However, the type of innovations identified within the public sector is in fact quite broad. This review identified several types of innovation. Innovation in terms of service and delivery includes the creation of new public services or changes to existing services (Windrum, 2008; Damanpour et al., 2009) and new or altered ways of supplying public services (Windrum, 2008). Administrative and organizational innovation, according to Aboelmegeed (2012), refers to maintaining effective administrative innovation performance that triggers business growth and encourages better values for firms and societies in a rapidly changing environment. Administrative and organizational innovation can potentially promote redesign and changes in work systems, skill enhancement, management systems, and incentives (Yamin et al., 1997). It also refers to new procedures, policies, management methods, and organizational forms. Such innovation explicitly helps firms deal with the turbulence of external environments, and is a significant driver of long-term business success in dynamic markets (Ussahawanitchakit, 2012). Conceptual innovation includes the introduction of new concepts, frames of reference, and new paradigms that help to reframe the nature of specific problems as well as their possible solutions (Bekkers et al., 2011). According to Windrum (2008), conceptual innovation in the public sector consists of the development of new views and challenges to existing assumptions. Policy innovation on the other hand includes changes to organizational thinking or behavioral intentions (Windrum, 2008), while systemic innovation refers to new or improved ways of interacting with other organizations and alternative sources of knowledge.

2.2.2 Quality performance

Quality in this context is defined as "an essential property of products (goods and services) in which high-quality products are those that meet customer needs, do not fail during use, and pose no threat to human well-being" (Juran, 2004). Quality management, however, involves an integrated approach to achieving and sustaining high-quality output, focusing on the maintenance and continuous improvement of processes and the prevention of defects at all levels and for all functions of the organization, to meet or exceed customer expectations. (Flynn et al., 1994). Governments are increasingly considering ways in which to improve public sector service quality (UKCeMGA, 2007). It is important to note, though, that knowledge is an integral part of the quality management process for a firm to achieve continuous improvement and performance excellence. Cong and Pandya (2003) have emphasized how KM is important for public sector to improve their quality of delivery and decision-making. Understanding the relationship between KM and quality performance has been said to be vital for the public sector (Akdere, 2009). SERVQUAL, a multi-item scale for measuring service quality, is now widely used in the public sector (Parasuraman et al., 1988). For instance, Muktar et al. (2013) have used SERVQUAL to assess quality performance in the Pakistani public sector, while Ilhaamie (2010) has used it to evaluate service quality in the Malaysian public sector.

2.2.3 Operational performance

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3 While various measures comprise operational performance in the public sector, a review of studies
4 conducted by international bodies such as the ECB (2006), the OECD (2007), and the IMF (2008), and
5 others such as Curristine (2007) and Goel et al. (2010) have shown that operational performance
6 within the public sector is mainly aimed at reducing costs and improving both the timeliness of
7 service delivery and productivity. Cong & Pandya (2003) have pointed out that knowledge
8 management increases efficiency and productivity of public sector, and according to Curristine
9 (2007), the public sector must also strive to reduce the service delivery cycle time.

11 **3. Framework development and hypotheses**

12 The main purpose of implementing KM **processes** is that it should improve firm performance. Given
13 the interconnected nature of the KM constructs, understanding the interrelationships are pivotal to
14 comprehend the scope of both the problems and the opportunities associated with KM in the public
15 sector. Theoretical frameworks provide a way to conceptualize these complex relationships. While
16 several studies in the private sector have investigated the relationships between KM **processes** and
17 firm performance (Darroch & McNaughton, 2003; Lee & Choi, 2003; Schulz & Jobe, 2001; Tanriverdi,
18 2005), in the case of public sector, only a limited number of studies that have looked at the
19 relationship between KM processes and performance and that too the focus was more on
20 innovation performance. At present, there is little or no understanding of how KM processes impact
21 quality and operational performance in the public sector. Given that innovation, quality and
22 operational performance are the three pillars of public sector performance, ideally, investment in
23 KM processes should have a positive impact on each of these performances. However, previous
24 studies such as Darroch & McNaughton (2002) and Cantner et al. (2011) have highlighted that
25 different KM processes impact performance differently. Therefore, like several private sector studies
26 (Chong, 2006; Gholami et al., 2013), understanding the impact of individual KM processes on three
27 pillars of public sector performance is critical for public sector practitioners to prioritize the
28 implementation of new KM processes or to reassess their existing KM processes in line with their
29 performance goals. The following relationships are being explored.

35 **3.1 KM processes and innovation performance**

36 While there is only limited understanding on the impact of KM **processes** on innovation performance
37 of the public sector, overwhelming number of studies in the private sector have demonstrated a
38 strong impact of KM **processes** on innovation performance.

39 Lee, Leong, Hew & Ooi (2011) explored the relationship between each of KM **processes** (knowledge
40 creation, knowledge capture and storage, knowledge sharing and knowledge application and use)
41 and innovation performance and found a significant and positive association between each KM
42 **processes** and innovation performance in the Malaysian manufacturing sector. Cantner et al. (2011)
43 in his large-scale empirical investigation found strong evidence of positive relationships between KM
44 **processes** and product and process innovation.

45 Jiang & Li (2009) found significant positive impact of KM **processes** (knowledge creation and
46 knowledge sharing) on the innovation performance (a measure of product innovation, R&D spending
47 and patents) of German firms engaged in strategic alliances with each other. Similarly, Liao &
48 Chuang (2006) found significant positive relationship between KM **processes** (combined) and
49 innovation performance (product innovation and process innovation) among large firms in Taiwan.

50 Ashok et al. (2016) found a positive association between investment in KM **processes** and innovation
51 performance (both radical and incremental innovation) among information technology service firms

in a multi-country study. Kamhawi (2012) found a positive association between KM activities and innovation performance among leading firms in Bahrain. Kiessling et al. (2009) found positive relationship between KM processes and innovation performance among Croatian firms.

Lin (2007) found positive association between knowledge sharing practices and firms' innovation capability among Taiwanese firms. Sáenz et al. (2012) found positive association between knowledge sharing and innovation performance among Spanish and Colombian medium-high and high technology firms. López-Nicolás & Merono-Cerdán (2011) found significant positive impact of knowledge capture and storage on innovation performance among Spanish firms. Darroch (2005) found significant and positive association between knowledge dissemination, knowledge acquisition and innovation performance among firms in New Zealand. Chang & Lee (2008) found knowledge capture and storage to positively impact innovation performance (administrative and technical innovation) among Chinese firms. Gloet and Terziovski (2004) found positive relationship between KM processes and innovation performance when a simultaneous approach of 'soft HRM practices' and 'hard IT practices' are implemented among Australian and New Zealand firms.

Hence, we posit the following hypotheses:

H1A: Knowledge creation will have a positive impact on innovation performance

H2A: Knowledge capture and storage will have a positive impact on innovation performance

H3A: Knowledge sharing will have a positive impact on innovation performance

H4A: Knowledge application and use will have a positive impact on innovation performance

3.2 KM processes and quality performance

Several authors have stressed the importance of knowledge management as a cornerstone in the quality improvement process (Zetie, 2002; Linderman et al., 2004; Akdere, 2009; Loke et al., 2012). For instance, Zetie (2002) highlighted that organization's quality manual is the depository of its process knowledge. Similarly, Lyons et al. (2008) highlighted the importance of KM processes for continuous quality improvement such as planning, execution and evaluation of performance. Some authors have linked quality improvement to specific KM processes such as knowledge creation (Kolesar, 1994).

However, despite these studies, empirical evidence on the impact of knowledge management and quality performance is scant in the private sector, let alone public sector. This is mainly because knowledge management and quality management are viewed as unrelated fields (Akdere, 2009). Therefore, like innovation performance, understanding the impact of KM processes on quality performance is important for knowledge management and quality professionals to develop and design effective KM programs in line with the organizational quality goals.

Hence, we posit the following hypotheses:

H1B: Knowledge creation will have a positive impact on quality performance

H2B: Knowledge capture and storage will have a positive impact on quality performance

H3C: Knowledge sharing will have a positive impact on operational performance

H4C: Knowledge application and use will have a positive impact on operational performance

3.3 KM processes and operational performance

Limited studies have looked at the impact of KM processes and operational performance in the private sector have found a positive association between the two. For instance, Fugate et al. (2009) investigated the relationship between KM processes and operational performance among US manufacturing firms and found a significant positive association between the two. Tan & Wong (2015) found a significant and a positive relationship between KM processes and operational performance (measure of cost, time and productivity) using data collected from manufacturing firms in Malaysia. Wang & Wang (2012) empirical investigation found a positive relationship between tacit knowledge sharing and operational performance among-high tech Chinese enterprises. Chen (2016) highlighted the importance of knowledge management on the operational performance in the tourism sector.

While the relationship between KM processes and operational performance is promising for the private sector, the relationship has not been explored previously in the public sector. Hence, we posit the following hypotheses:

H1C: Knowledge creation will have a positive impact on operational performance

H2C: Knowledge capture and storage will have a positive impact on operational performance

H3C: Knowledge sharing will have a positive impact on operational performance

H4C: Knowledge application and use will have a positive impact on operational performance

To summarize, the seven KM constructs (four KM processes and three KM performances) and the twelve hypotheses proposed together form the KM processes-performance framework for the public sector, as shown in Figure 1.

Insert Figure 1

Now that we have developed the framework, the next stage is to validate the proposed framework and test the hypotheses proposed in the study. The survey-based research methodology undertaken to achieve this is explained in the next section.

4. Research Methodology

A survey-based research methodology, the most widely used method within business and management research (Saunders et al., 2016), was undertaken to validate the proposed KM framework and for testing the hypothesis since surveys are an effective tool to capture individual perceptions and for investigating cause and effect relationships (Ghuari and Gronhaug, 2002). Moreover, it allows structured data collection from a large representative sample population, thereby enhancing the generalizability of the findings to a larger population.

The underlying factors within each construct, as given in Table 1, are organized in the form of a survey questionnaire. Each item was measured on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). To ensure the content and face validity, the survey questionnaire was given to six senior managers in the UAE public sector and one senior academic with expertise in knowledge management to review the survey instrument. The review mainly included checking the appropriateness of each item, readability, selection of terminology, clarity and ease of understanding on the intended objective of the question as well as the relevance of the items of the

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3 UAE public sector. Several suggestions were received and based on them appropriate modifications
4 were made to improve the survey instrument, including re-arranging the survey questions and
5 reducing the survey length.
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7 After finalizing the survey instrument, the invitation was sent in the summer of 2016 to various
8 public sector authorities in the UAE to participate in the study. A total of 12 public sector entities
9 across the UAE took part in the survey resulting in 318 responses. Of the 318 responses, 48
10 incomplete responses were removed, leaving 270 valid responses. The demographic details of the
11 survey responses are shown in Table 2.
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18 The study do acknowledge the limitation of only collecting data from 12 public sector entities as it
19 limits the generalizability of findings. However, the fact that most of these public sector entities we
20 surveyed were large umbrella entities comprising of several sub-entities with different functions and
21 performance goals, to some extent enhances the generalizability. For example, the municipality had
22 several sub-entities within, with each having different functions and performance goals such as food
23 safety, environmental, buildings, drainage and irrigation, transportation, and sewage treatment.
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26 However, before proceeding with the analysis, we checked for any potential issues of common
27 method bias (CMB) and non-response bias. CMB is a problem that occurs when one respondent
28 answers all of the self-reported questionnaire involving multiple constructs (Podsakoff et al., 2003).
29 In fact, prior to collecting data, procedural remedies suggested by Podsakoff et al. (2003) such as
30 informing respondents about the data confidentiality and anonymity were used to prompt them to
31 answer as honestly as possible. After data collection, one of the most widely used method to check
32 CMB is Harman's single factor test, to investigate whether any single-factor accounts for the
33 majority of the total variance (Podsakoff et al., 2003). If the majority of the variance (greater than
34 50%) is explained by one factor, then CMB exists. The results of the exploratory factor analysis (EFA)
35 by constraining all items to one factor revealed the total variance was only 36%, demonstrating that
36 CMB was not a major issue in this study. For non-response bias, responses of early respondents
37 were compared to that of late respondents, with the underlying assumption that the opinions of late
38 respondents were representative of the opinions of the theoretical non-respondents (Rogelberg &
39 Stanton, 2007). The t-test revealed no significant difference between the two groups for all the
40 items, indicating that non-response bias was not a problem in this study (Armstrong and Overton,
41 1977).
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46 **5. Analysis and Findings**

47 The first phase of framework validation is checking the convergent and discriminant validity of the
48 constructs.
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50 **5.1. Convergent validity:**

51 The unidimensionality of each of the seven constructs was tested using first-order confirmatory
52 factor analysis (CFA). The CFA was conducted separately for KM processes and firm performance.
53 The results as seen in Table 3 and Table 4, indicate a strong convergent validity. The confirmatory
54 factor loading (which indicate the correlation between the individual items and the corresponding
55 construct) of all items except one (OP1) were well above 0.5 and significant at $p < 0.001$,
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demonstrating strong convergent validity (Anderson & Gerbing, 1988). The one item in operational performance that failed to load was excluded from further analysis. Importantly, the overall model fit (χ^2/DF) and goodness of fit indices (CFI; TLI; RMSEA) were all near the acceptable range (Bagozzi & Yi, 1988), further validating the unidimensionality of the constructs. Also, the average variance extracted (AVE) was greater than 0.50, indicating strong convergent validity (Fornell & Larcker, 1981).

 Insert Table 3

 Insert Table 4

5.2. Discriminant validity

The discriminant validity test is conducted to ensure that items representing different constructs are not related to each other. In other words, correlation of items representing different constructs should be low. Table 5-6 shows the pair-wise correlation between the items for KM processes and performance. The results indicate that the inter-correlation between the constructs was less than suggested threshold of 0.85 (Kline, 2005). Furthermore, the square root of the AVE exceeded each pairwise correlation between the constructs (Fornell & Larcker, 1981). The results imply strong discriminant validity.

5.3. Test for Reliability of the constructs

Reliability is a measure of internal consistency. The most accepted measure for reliability is Cronbach's alpha (Cronbach, 1951). The coefficient alpha ranges from 0 to 1, in which a high score indicated high reliability. The acceptable threshold for reliability is 0.70 (Nunnally & Bernstein, 1994). The reliability scores of each of the seven constructs are provided in Table 5-6. The results demonstrate strong reliability for all of the constructs.

 Insert Table 5

 Insert Table 6

5.4. Descriptive Statistics

The relative importance of each construct is understood using descriptive statistics. The combined mean (\bar{X}) and standard deviation (SD) of the constructs are shown in Table 5-6. As seen in Table 5, for KM processes, the implementation is moderate, with \bar{X} ranging from 3.62 to 3.93 with knowledge capture and storage (KMCS) receiving the lowest score, while knowledge creation (KMC) received the highest score. Again, a high degree of variability of KM processes implementation shows that the implementation is not consistent. In addition, the fact that none of the KM processes scored above 4.00 shows that respondents in general agree that there is significant room for improvement in KM processes in the public sector. Finally, concerning firm performance, the \bar{X} ranged from 3.46 to 3.92, with quality performance receiving the highest score. However, both quality performance (SD=1.75) and innovation performance (\bar{X} =3.59; SD=1.96) had high variability. In the case operational performance, though the performance is moderately low (\bar{X} =3.46), the SD is also relatively low (SD=1.10) indicating consistency in the responses.

Now that the seven first order constructs have been validated, we can proceed to testing the hypotheses proposed in the study. The results of the hypotheses tests are explained in the next section.

5.6. Structural equation modeling and hypotheses test results

Structural Equation Modeling (SEM), a statistical technique for representing, estimating, and testing hypothesized relationships (Rigdon, 1998), was used for this study. Several studies in KM has previously used SEM to assess the causal relationships such as between KM processes and performance (Gholami et al., 2013). The main advantage of SEM over other approaches is that it can test relationships between unobserved latent constructs (Lei & Wu, 2007). Although there are no strict guidelines on the sample size for SEM, the minimum sample size recommended by researchers is approximately 200 (Kline, 2005; Lei & Wu, 2007), though a sample size of 100-150 with no missing values was found to provide valid results (Muthén & Muthén, 2002; Tinsley & Tinsley, 1987; Anderson & Gerbing, 1988). Hence, the final sample size of the study (n=270), comparable to that of other studies such as Gholami et al. (2013) was sufficient for conducting SEM. The strength of the hypothesized relationships and their significance are shown in Figure 2.

 Insert Figure 2

The results indicate that all the 12 hypotheses are supported. Table 7 gives the summary of the hypotheses test results. Regarding the strength of the relationships, standardized path coefficients in the structural equation model with absolute value <0.30 represent small effect, between 0.30 and 0.70 represent medium effect and >.70 represent large effect (Kline, 1998).

 Insert Table 7

The results of H1A, H1B and H1C show that the impact of knowledge creation is highest on innovative performance ($\beta = 0.752$, $p < 0.001$), while the impact is moderate for both quality performance ($\beta = 0.673$, $p < 0.001$) and operational performance ($\beta = 0.571$, $p < 0.001$). This is not

surprising, given that new knowledge creation is more fundamental for innovative performance than for the others. However, there is still scope in the UAE public sector to focus on knowledge creation to improve quality and operational performance. The findings of H2A, H2B and H2C are also similar, revealing that the impact of knowledge capture and storage is highest on innovation performance ($\beta = 0.755$, $p < 0.001$), and moderate for quality performance ($\beta = 0.644$, $p < 0.001$) and operational performance ($\beta = 0.628$, $p < 0.001$). With regards to H3A, H3B and H3C, the results show that the impact of knowledge sharing is strong on both innovation ($\beta = 0.766$, $p < 0.001$) and quality performance ($\beta = 0.730$, $p < 0.001$), while moderate on operational performance ($\beta = 0.614$, $p < 0.001$). Similarly, the results of H4A, H4B and H4C show that the impact of knowledge application and use is strong on both innovation ($\beta = 0.758$, $p < 0.001$) and quality performance ($\beta = 0.708$, $p < 0.001$), while moderate on operational performance ($\beta = 0.617$, $p < 0.001$).

6. Discussions and Conclusions

Although the impact of KM processes on performance was found to vary, i.e., KM processes, was found to have the strongest impact on innovative performance, followed by quality performance and operational performance, the results in general are promising as each of the individual KM processes was found to impact positively on KM performance across all three performance dimensions. The findings are comparable to the findings in the private sector such as Zack et al. (2009) and Al-Ahbab, Singh, Gaur, & Balasubramanian (2017), who investigated the relationship between KM processes and firm performance (combined measure of innovation, quality and operational performance) and Liu et al. (2004) who found a significant positive relationship between KM processes and firm's competitiveness (which include quality performance and innovation performance as sub-measures among others). This implies that KM processes can not only improve the performance of private sector but also public sector. Having said that, the mean values of each of the KM processes (3.62-3.93) and KM performance (3.46-3.93) are in the moderate range, and therefore, there is plenty of scope in the public sector to improve KM processes implementation. The perceived moderate scores of KM processes and performance is not surprising given that it is only recently UAE has started implementing KM processes as part of its long term goal of moving towards a knowledge based economy. More focus is required to improve the extent of implementation, especially those processes that are lagging behind such as knowledge capture and storage (KMCS). More training programs, workshops and seminars on knowledge management processes' implementation as well as leveraging knowledge management processes to foster improvement in innovation, quality and operational performance could help improve the moderate scores received for KM processes and KM performance. Future studies therefore could also look at the antecedents to KM processes such as enablers and barriers impacting KM processes as it would enable the UAE public sector to better leverage the enablers and minimize/eliminate the barriers, leading to higher scores for KM processes and subsequently higher scores for KM performance. Also, increase in the federal level and state level budget allocation for KM could see the perceived mean scores of KM processes and KM performance increasing in the future.

The results provide several practical/managerial implications and theoretical/research implications. The strong and significant impact of KM processes on firm performance is encouraging for the sector and is expected to provide impetus for practitioners and policy-makers to implement KM processes in the public sector. Also, the findings imply that public sector should consider implementing all KM processes instead of focusing solely on one or a few individual KM processes. Although the results of this study may vary by country, given the fact that most of the underlying objectives and operations

of public sector are similar in most countries, especially in the GCC countries, where there is considerable resemblance in the public sector, the findings, including the framework, can be a good starting point for practitioners and policy-makers in other countries for implementing KM processes in the public sector.

There are several research implications of this study. First, it fills a critical gap in the literature by developing a comprehensive KM framework for the public sector. Researchers have previously highlighted the need for a comprehensive and unified framework, as each of them has addressed only certain aspects of KM (Cong & Pandya, 2003). Hence, the proposed framework in this study is both novel and significant. Second, each of the proposed first-order constructs of the KM framework are validated in this study and hence will be useful for researchers to conduct future investigations. Since construct development and validation is at the epicenter of theory building (Venkatraman, 1989), this study significantly contributes toward the theoretical advancement of KM in general. Also, given the fact that most of the previous KM research in the public sector and in general has focused mainly on developed countries in the west and developing countries in Asia, such as Malaysia and India, this study fills a gap by focusing on the UAE/Middle-eastern region.

However, the study has some limitations. The main limitation of this study is the fact that data was collected only from 12 public sector entities in the UAE, although they had several sub-entities within. Therefore, the impact of KM processes on KM performance may not truly represent the UAE public sector performance. Moreover, given the limited literature on KM processes and performance in the public sector, the findings of this study are only directional at its best.

Future studies with increased participation from more public sector entities is required to enhance the validity and generalizability of the findings, and tease out more managerially relevant implications. The other limitation is the use of perceptual measures to capture KM processes and KM performance, though, in this case, this is justified because of the lack of availability of published processes and performance data. If the data become available, future research can focus on using actual and preferably more objective data on processes and performance. Moreover, the construct proposed needs to be further validated and tested in different contexts. Future studies could use the framework as such or refine/adapt the framework to suit other contexts, including those in the private sector. Overall, given the conceptual comprehensiveness of the proposed framework, it is expected to significantly improve the application of knowledge management in the public sector.

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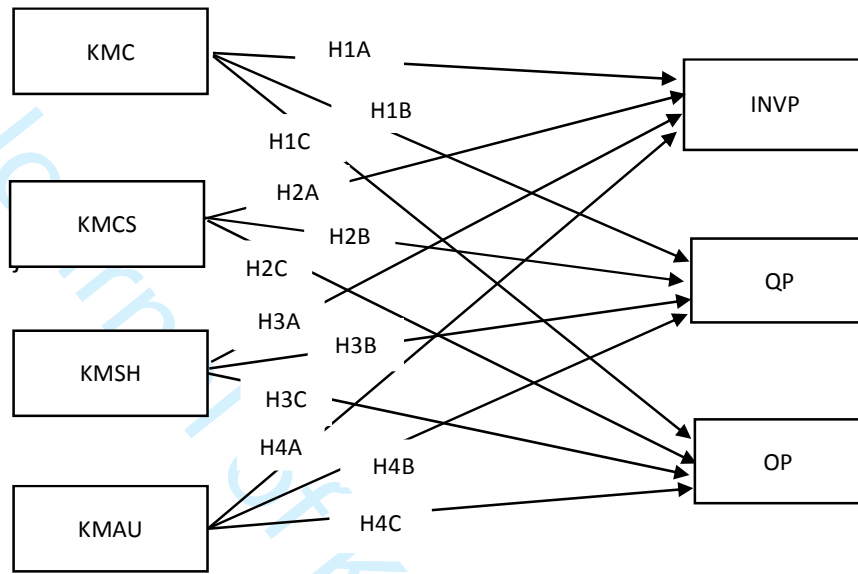
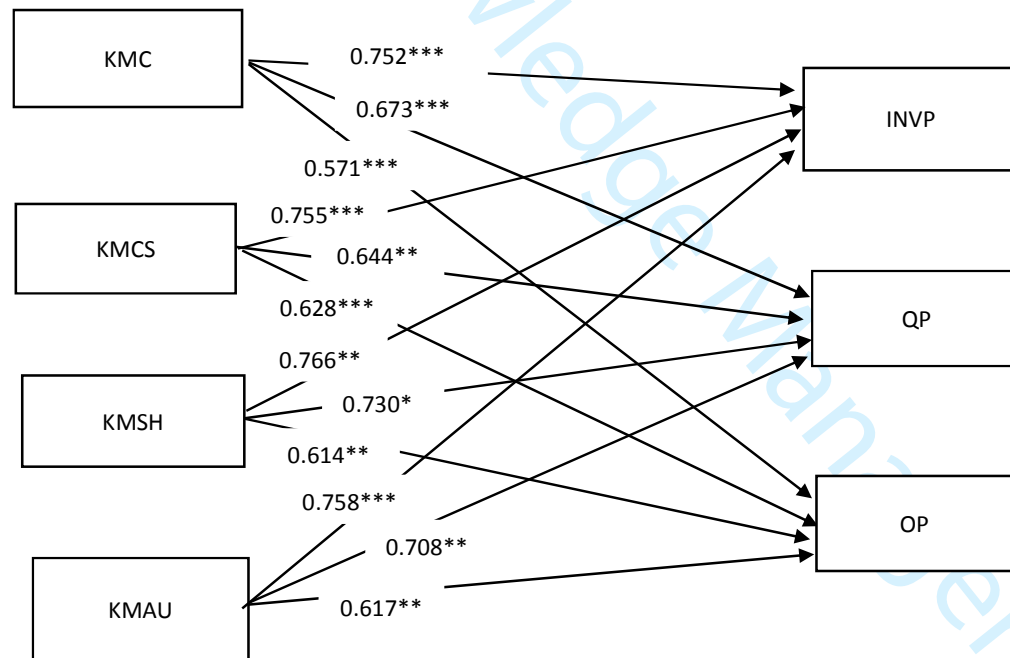


Figure 1: Proposed research framework



Goodness of fit indices: Chi-square/df=3.109; CFI=0.891; TLI=0.910 RMSEA=0.063; ***p<0.001

Figure 2: Model fit and strength of the hypothesized relationships

Table 1 Measurement Items of Knowledge Management for the Public Sector

Constructs and items – KM Processes	Literature Source
Knowledge Creation (KMC): My organization	
Has mechanism for creating and acquiring knowledge from different sources such as employees, customer, business partners and competitors (KMC1)	Lawson (2003)
Encourages and has processes for the exchange of ideas and knowledge between individuals and groups (KMC2)	Lawson (2003)
Rewards employees for new ideas and knowledge (KMC3)	Lawson (2003)
Has mechanism for creating new knowledge from existing knowledge (KMC4)	Lawson (2003)
Knowledge Capture and Storage (KMCS): My organization	
Responds to employees' ideas and documents them for further development (KMCS1)	Lawson (2003)
Has mechanisms in place to capture knowledge from employees, customers and business partners (KMCS2)	Lawson (2003)
Has mechanism in place to patent and copy right new knowledge (KMCS3)	Lawson (2003)
Captured knowledge is codified and is stored in company's knowledge repositories (KMCS4)	Lee and Wong (2015)
Stored knowledge is readily accessible for employees who need it (KMCS5)	Lawson (2003)
Knowledge Sharing (KMSH): My organization	
Sends out timely reports and newsletters to employees, customers and other relevant organizations (KMSH1)	Lawson (2003)
Conducts regular symposiums, lectures, conferences and training sessions to share knowledge (KMSH2)	Lawson (2003)
Employees are encouraged to frequently participate in informal discussions to share knowledge (KMSH3)	Lee and Wong (2015)
Employees use latest files sharing systems to share knowledge efficiently (KMSH4)	Own contribution
Knowledge Application and Use (KMAU): My organization	
Has processes and systems in place for applying knowledge learned from past experiences (KMAU1)	Lawson (2003)
Application of knowledge is enhanced by mechanisms in place that match sources of knowledge to problems (KMAU2)	Lawson (2003)
Employees are encouraged to apply useful proposals/ideas in practice (KMAU3)	Lee and Wong (2015)
Employees are encouraged to apply their knowledge to solve problems (KMAU4)	Lee and Wong (2015)

Table 1 Measurement Items of Knowledge Management for the Public Sector (Continued)

Constructs and items – Public sector performance	
Innovation Performance (INVP): In my organization, there is a high extent of:	
Service innovation (e.g: introduction of a new service; changes to improve an existing service) (INVP1)	Windrum (2008)
Service delivery innovation (new or altered ways of supplying public services) (INVP2)	Windrum (2008)
Administrative and organizational innovation (changes in organizational structures and routines) (INVP3)	Windrum (2008)
Conceptual innovation (developing new views and challenging existing assumptions) (INVP4)	Windrum (2008)
Policy innovation (changes to thinking or behavioral intentions) (INVP5)	Windrum (2008)
Systemic innovation (new/improved ways of interacting with other firms and sources of knowledge) (INVP6)	Windrum (2008)
Quality Performance (QP): In my organization:	
The appearance of physical facilities is in line with the services offered and is visually appealing (QP1)	Parasuraman et al. (1988)
Promise with regards to the service offered are always kept (QP2)	Parasuraman et al. (1988)
The equipment's used are up-to-date (QP3)	Parasuraman et al. (1988)
Customers are always provided with individualized attention (QP4)	Parasuraman et al. (1988)
Customers always feel safe in their transactions with the employees in my organization (QP5)	Parasuraman et al. (1988)
Employees always show willingness to help customers (QP6)	Parasuraman et al. (1988)
Employees always are sympathetic and reassuring to customers with problems (QP7)	Parasuraman et al. (1988)
Operational Performance (OP): In my organization:	
Day to day operational expenses have reduced (OP1)	Cong and Pandya (2003); Curristine et al. (2007)
Employee productivity has increased (OP2)	Curristine et al. (2007)
The service delivery cycle time has reduced (OP3)	Curristine et al. (2007)

Table 2: Demographic details of respondents

Classification	Responses	Percentage
<u>Firm ownership</u>		
Federal government entity	92	34%
Local government entity	134	50%
Semi-government entity	44	16%
Total	270	100%
<u>Headquarters of the organization</u>		
Abu Dhabi	236	87%
Dubai	31	12%
Others	3	1%
Total	270	100%
<u>Number of employees</u>		
Less than 250	159	59%
251 to 500	63	23%
501 to 2000	26	10%
2001 to 5000	5	2%
>5000	17	6%
Total	270	100%

Table 3: First order-confirmatory factor analysis result for KM processes

Constructs and Items	Standardized regression weight	S.E.	t-value
<u>KM Creation (KMC)</u>			
KMC1	0.721		Initially constrained to 1
KMC2	0.812	0.089	13.175***
KMC3	0.743	0.107	11.683***
KMC4	0.872	0.093	13.717***
<u>KM Capture and Storage (KMCS)</u>			
KMCS1	0.754		Initially constrained to 1
KMCS2	0.762	0.078	12.614***
KMCS3	0.675	0.087	10.803***
KMCS4	0.770	0.087	12.153***
KMCS5	0.784	0.086	12.572***
<u>KM Sharing (KMSh)</u>			
KMShar1	0.742		Initially constrained as 1
KMShar2	0.776	0.088	13.017***
KMShar3	0.798	0.090	13.353***
KMShar4	0.770	0.083	12.858***
<u>KM application and use (KMAU)</u>			
KMAU1	0.863		Initially constrained as 1
KMAU2	0.901	0.050	20.956***
KMAU3	0.807	0.053	16.341***
KMAU4	0.813	0.052	16.659***
Goodness of fit indices: Chi-square/df=2.819; CFI=0.922; TLI=0.946; RMSEA=0.66			
***p<0.001			

Table 4: First order-confirmatory factor analysis result of public sector performance

Constructs and Items	Standardized regression weight	S.E.	t-value
<u>Innovation Performance</u>			
INVP1	0.837		Initially constrained to 1
INVP2	0.873	0.055	18.525***
INVP3	0.836	0.058	17.222***
INVP4	0.918	0.052	20.266***
INVP5	0.872	0.055	18.502***
INVP6	0.911	0.054	19.983***
<u>Quality Performance</u>			
QP1	0.625		Initially constrained to 1
QP2	0.745	0.118	10.289***
QP3	0.722	0.124	10.054***
QP4	0.829	0.114	11.134***
QP5	0.847	0.110	11.306***
QP6	0.869	0.102	11.507***
QP7	0.873	0.112	11.539***
<u>Operational Performance</u>			
OP1	0.390 ^a		Initially constrained as 1
OP2	0.911	0.440	5.672***
OP3	0.530	0.254	5.312***
Goodness of fit indices: Chi-square/df=2.941; CFI=0.964; TLI=0.973; RMSEA=0.041			
***p<0.001; ^a Failed to load (loading <0.5)			

Table 5: Mean, standard deviation, reliability, AVE and correlation for KM processes

Construct (No. of items)	Mean (\bar{X})	SD	Cronbach's alpha	AVE	KMC	KMCS	KMSh	KMAU
KMC (4)	3.93	1.47	0.864	0.62	-	0.63**	0.61**	0.66**
KMCS (5)	3.62	1.64	0.865	0.56	0.63**	-	0.69**	0.67**
KMSh (4)	3.83	1.57	0.854	0.60	0.61**	0.69**	-	0.74**
KMAU (4)	3.85	1.54	0.911	0.72	0.66**	0.67**	0.74**	-

**p<0.01

Table 6: Mean, standard deviation, reliability, AVE and correlation of public sector performance

Construct (No. of items)	Mean (\bar{X})	SD	Cronbach's alpha	AVE	INVP	QP	OP
INVP (6)	3.59	1.96	0.951	0.77	-	0.62**	0.45**
QP (7)	3.92	1.75	0.918	0.63	0.62**	-	0.48**
OP (3)	3.46	1.10	0.711	0.55	0.45**	0.48**	-

**p<0.01