

Does size matter? The effects of public sector organizational size' on knowledge management processes and operational efficiency

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Abstract

Purpose – Firm size is an important contingency variable in macro-organizational studies. Several questions arise in relation to knowledge management and organizational size that is critical to both public and private organizations. Unfortunately, despite its significance, all or most of the studies that examined the effects of organizational size' on knowledge management have been in the private sector. This paper aims to empirically study the effects of organizational size on the key knowledge management processes and subsequent operational efficiency derived from its implementation in the public sector.

Design/methodology/approach – A structured country-wide survey of United Arab Emirates public sector organizations was conducted. The 383 completed responses obtained were then analysed to assess the hypothesized differences in the implementation of knowledge management processes (knowledge acquisition, knowledge creation, knowledge capture, knowledge storage and retrieval, knowledge sharing, knowledge utilization) and its impact on the operational efficiency across small and medium, large and very large public sector organizations.

Findings – The results revealed that the extent of implementation of all six knowledge management processes and operational efficiency followed an inverted "V" pattern, in which, both knowledge management processes and operational efficiency was found to increase while transitioning from small and medium entities to large entities, but was found to decrease while transitioning from large to very large entities. In terms of relationships, while all knowledge management processes had a significant positive impact on the operational efficiency of the public sector, the ability to derive operational efficiency from knowledge management processes was found to be the highest for very large public sector organizations.

Practical implications – The novel findings are useful for practitioners and policymakers, especially those overseeing a country's knowledge management initiatives to devise strategies, policies and support mechanisms to ensure public sector organizations, regardless of their size, can implement efficient and effective knowledge management processes to improve their operational efficiency.

Originality/value – The study is arguably the first comprehensive attempt to understand the impact of organizational size on knowledge management in the public sector.

Keywords Knowledge management, Public sector, Public sector organizations, United Arab Emirates, Operational efficiency

Paper type Research paper



1. Introduction

Knowledge management is increasingly becoming critical to public sector organizations as it is to private sector organizations (Al Yami and Ajmal, 2019). A country's transition towards a knowledge-based economy warrants an efficient and effective implementation of knowledge management processes at all government organizations/entities (APO, 2013). However, different public sector organizations/entities have varying sizes. Organizational size is an important contingency variable in macro-organizational studies that can affect an organization's knowledge management strategy, processes and performance (Daud, 2012; Oyoo, 2019). Hence, several questions arise in relation to knowledge management and organizational size that is critical to both public and private organizations. Yet, all or the majority of the studies that have investigated the impact of firm size on knowledge management have been in the private sector (Moffett and McAdam, 2006; Serenko *et al.*, 2007). Our literature search revealed that there exists a significant gap with regard to how organizational size impacts the implementation of knowledge management processes in public sector organizations. Addressing this gap is critical given that all public sector organizations are not created equal in size.

Further, today, public sector organizations are increasingly held accountable for their actions, and therefore, are forced to change their traditional bureaucratic approaches to more managerial ones (Al Yami and Ajmal, 2019). Citizens are expecting the service offered by public sector entities (such as health care, education) to be above or at least at par with private sector organizations. According to Massaro *et al.* (2015), the public sector entities are facing higher pressures for representativeness, accountability and responsiveness than private-sector firms. Moreover, they face scrutiny and budgetary pressure to reduce spending and wastage of resources, without diluting the standards of service. This general lack of "operational efficiency of the public sector" in the face of diminishing budgets is a concern that needs to be addressed (Massaro *et al.*, 2015). Implementation of efficient and effective knowledge management initiatives is now considered as a way forward for public sector entities at various levels such as international government agencies, the federal government, state governments and local government entities at the municipal level to improve its operational efficiency (APO, 2013). For instance, Butler *et al.* (2008) highlighted that knowledge management processes in the public sector would lead to better operational efficiency in the services offered.

But differences in the size of different public sector entities leads to the fundamental question of this study: could the organizational size of public sector entities be a factor in determining the success or failure of knowledge management processes in these entities? The aim of this paper, therefore, is to explore the effects of organizational size on knowledge management processes implementation and its subsequent impact on operational efficiency in the public sector.

Specifically, the study will seek to know the following:

- Firstly, we need to know whether different-sized public sector entities (small and medium entities, large entities and very large entities) differ in terms of the extent of knowledge management process implementation, with the understanding required at the individual process level as it could differ for each. Policymakers and practitioners could then support the implementation-wise deficient organizational-size category for each knowledge management process.
- Secondly, it is important to know from an operational efficiency perspective; whether the operational efficiency derived from knowledge management process implementation differ for different-sized public sector entities. Entities belonging to

a specific size category that are lagging in operational efficiency could then be specifically supported to enable entities to bridge the gap.

- Finally, to better manage knowledge management initiatives, it is critical to understand how individual knowledge management processes have translated into operational efficiency improvements. The weak links that exist between any knowledge management processes and operational efficiency could then be selectively improved.

Hence, we propose the following research questions (RQ) of this study:

- What is the impact of the organizational size of public sector entities on the extent of implementation of knowledge management processes?
- What is the impact of organizational size on the operational efficiency of public sector entities?
- What is the impact of the organizational size of public sector entities on the intricate relationships between knowledge management processes and operational efficiency?

The findings of this study are, therefore, expected to provide significant insights for the concerned authorities/bodies to enact effective strategies and policies to ensure all public sector organizations, regardless of their size, can implement efficient and effective knowledge management processes and achieve their desired operational efficiency targets.

The significance of this study is even more for countries such as the United Arab Emirates (UAE) that are striving towards a knowledge-based economy from an oil-based economy in the wake of declining oil prices ([AlShamsi and Ajmal, 2018](#)). In the Arab ecosphere, the significance of knowledge management is highlighted in the “Arab Knowledge Report 2014”, which highlights a detailed strategic vision associated with the shift towards a knowledge-based economy in the Arab World ([United Nations Development Programme, 2014](#)).

Hence, we have purposefully selected UAE for the investigation because UAE is one of the few countries in the region where different levels of government have supported knowledge management initiatives as part of its own 2021 vision ([DSG, 2014](#)) to transition from an oil-based economy to a knowledge-based economy in the wake of declining oil prices. For example, the establishment of the Mohammed Bin Rashid Al Maktoum Foundation in 2007 with a \$10bn endowment fund is, perhaps, one of the significant government initiatives taken to advance knowledge management in the Arab region ([Al Yami and Ajmal, 2019](#)). The efforts of the UAE towards knowledge management is reflected by the fact that the UAE was ranked first in the Arab world and 42nd overall in the knowledge economy index created by the World Bank ([DSG, 2014](#)). Therefore, the UAE provides a perfect context to compare the knowledge management processes and subsequent operational efficiency of different-sized public sector entities.

Although the results of this study may vary by country, given the fact that most of the underlying characteristics, objectives and operations of the public sector are similar in most countries, especially in the Gulf Cooperation Council countries where there is considerable resemblance in the public sector ([Al Ahbabi et al., 2019](#)), the findings, including the study framework, can be a good starting point for practitioners and policymakers in other countries for implementing knowledge management processes in the public sector.

2. Review of literature and hypotheses development

To date, we have not come across any studies that have investigated the impact of firm size on knowledge management in the public sector. Given that different public sector organizations have different sizes, organizational size could impact knowledge management implementation as each public sector entity is likely to have a different structure and governance mechanisms based on its size. Hence, to examine the impact of organizational size on knowledge management, this study classifies public sector organizations into three, namely, “small and medium entities”, “large entities” and “very large entities”. The following sections discuss each of the knowledge management processes, operational efficiency and their relationships relevant to the public sector.

2.1 Knowledge management processes

Knowledge management processes are vital activities that an organization performs in processing and manipulating its knowledge resources (Holsapple and Joshi, 2000). However, given that there is a lack of agreement on the various components of knowledge management processes, we have reviewed several key studies in knowledge management for establishing a common conceptual base and for ensuring the constructs developed are managerially relevant for the public sector (Cong *et al.*, 2007; McAdam and Reid, 2000; Lawson, 2003; Lee and Choi, 2003). In other words, the key components of knowledge management processes are not directly inherited from other studies; instead, it was carefully synthesized and contextualized based on the authors understanding of knowledge management and the public sector.

The relevant knowledge management processes for the public sector derived from the literature are knowledge acquisition, knowledge creation, knowledge capture, knowledge storage and retrieval, knowledge sharing and knowledge utilization. The definitions of the key knowledge management processes derived from the literature are provided in Table 1.

Each of these knowledge management processes and its relevance for the public sector are discussed in the following sections.

2.1.1 Knowledge acquisition. This process is oriented towards obtaining/acquiring knowledge (Gold *et al.*, 2001). This includes both internal and external knowledge acquisition. According to Bloodgood (2019), knowledge acquisition is essential for firms to

Constructs	Definition
Knowledge acquisition	This involves the search for, recognition of and assimilation of potentially valuable knowledge, often from outside the organization King (2009)
Knowledge creation	This is the development of new knowledge and know-how – innovations that did not have a previous existence Dalkir (2017)
Knowledge capture	This involves a systematic process of documentation of acquired or created knowledge, know-how, experiences and lessons learned Shafia <i>et al.</i> (2011)
Knowledge storage and retrieval	This involves the preservation of organizational knowledge in such a way it is secure, it is coded and indexed so that it can be retrieved quickly and easily by the users APO (2013)
Knowledge sharing	This refers to the organization's ability to transfer or disseminate knowledge from one person, group or organization to another Lee (2001)
Knowledge utilization	This refers to the organization's ability to use knowledge for a purpose APO (2013)

Table 1.
Knowledge
management
processes definitions

benefit from new understandings. According to the knowledge-based view, innovative firms must leverage their acquisition capabilities to update their knowledge capital regularly to match new environmental conditions (Alguezaui and Filieri, 2010). The organizations' ability to recognize and evaluate pertinent knowledge is key to the acquisition process (Yli-Renko *et al.*, 2001). This is important because, some new knowledge may be flawed, inappropriate or irrelevant for the firm's context (Bloodgood, 2019). It includes gathering knowledge on the best practices internally and externally, as well as those practices that succeeded and failed (Yli-Renko *et al.*, 2001). According to Grimpe and Kaiser (2010), balancing internal and external knowledge acquisition is essential. External knowledge acquisition includes the process of engaging in dialogue with external stakeholders such as suppliers and customers, whereas internal knowledge acquisition involves acquiring knowledge within the organization such as from employees (Lee and Choi, 2003; Yli-Renko *et al.*, 2001).

2.1.2 Knowledge creation. This process is oriented towards the organizations' ability to create new ideas and solutions (Marakas, 1999) not only from scratch but also the reconfiguration of existing pieces of knowledge to create new knowledge (Gold *et al.*, 2001). According to Bhatt (2000), organizations can always put together the pieces of knowledge that exist within using the strategy of "imitation, replication and substitution". According to Nonaka's (1994) dynamic theory of organizational knowledge creation, knowledge creation is an interplay between tacit and explicit knowledge. Therefore, organizations must encourage the exchange of ideas between individuals and groups such as through participative decision-making processes (Locke *et al.*, 1997) or brainstorming sessions (Hutchinson and Quintas, 2008). Also, studies have shown that organizations that encourage employees to work together in a team and organizations that reward employees for new ideas are more efficient at creating new knowledge (Altinay *et al.*, 2008; Chong *et al.*, 2011). Similarly, Dermol (2013) reported that encouraging employees to experiment with new ideas and concepts can boost the knowledge creation process.

For the public sector, knowledge creation is essential, given that governments are often at the forefront of needing to adopt new approaches (APO, 2013). It can take many forms such as the discovery of new techniques and methods for problem-solving, borrowing of ideas or practices externally and contextualizing and integrating them into the organization (Biygautane and Al-Yahya, 2010). However, this process requires collaboration, discussions and articulation of new knowledge among individuals. For example, at Dubai Courts, to foster knowledge creation, judges and employees at the Courts are incentivized to be innovative in handling the cases they deal with (Biygautane and Al-Yahya, 2010). Al-Khourri (2014) highlighted the importance of rewards and employee suggestion system for improving knowledge creation in the case of the Emirate Identity Authority.

2.1.3 Knowledge capture. Studies have shown that even if a firm creates new knowledge, it may not necessarily result in capture (Argote *et al.*, 1990). Therefore, it is important to capture such knowledge and make it available for the organization in the future (Stein and Zwass, 1995). This includes converting tacit knowledge into explicit knowledge by encouraging or coercing employees to document and store their work in the form of reports, procedures and technical know-how. For example, in the case of projects, it is important to document both positive and negative experiences such as reasons for the failure of certain parts of the project (Shafia *et al.*, 2011).

For instance, Lawson (2003) highlighted the importance of having mechanisms in place to patent and copyright new knowledge. Also, organizations should encourage knowledge capture in the form of department reports, meeting minutes, training manuals, handbooks and other means (White and Cohan, 2016). Hari *et al.* (2004) highlighted the importance of

employees documenting their work communications and any new knowledge that is created. Similarly, in the case of retirement of the employee or resignation or termination of employee, if their knowledge is not systematically captured, the organization will not be able to leverage the contributions made by them during their tenure, and also avoid time and resource wastage in recreating knowledge, which is available and in avoiding past mistakes (Shafia *et al.*, 2011).

For the public sector, knowledge capture is important because it is known for its underutilization of knowledge and skills of employees, especially in the region including UAE, Oman and Saudi Arabia (Al-Yahya, 2009). Accordingly, almost half of the available organizational skills and knowledge are not captured and stored. According to Biygautane and Al-Yahya (2010), the “know-how” and “know-what” that employees have gained through the years of experience is not well-recognized, captured or documented in the public sector. This implies that when employees leave the organization, they take with them the valuable tacit knowledge they have accumulated over the years. Increasing efforts are taken by public sector entities to capture and store knowledge. For example, in Dubai police, police officers are strongly encouraged to write about the new cases they have encountered, and how they have solved them. Financial incentives are offered for those employees who regularly write articles (document) about their experiences (Biygautane and Al-Yahya, 2010).

Similarly, in Dubai Aviation, pilots are required to document their experiences and mistakes they make, and to explain how they solved problems (Biygautane and Al-Yahya, 2010). Similarly, in the case of International Enterprise Singapore (IES), a government agency driving Singapore’s external economy, programmes such as storytelling were developed to capture employees’ overseas experiential knowledge (APO, 2013). Emirates Identify Authority in the UAE has used numerous information technology systems to capture knowledge management in real-time (Al-Khouri, 2014).

2.1.4 Knowledge storage and retrieval. Studies have shown that even if a firm capture knowledge, it does not necessarily become available for the organization for future use (Stein and Zwass, 1995). The captured knowledge needs to be codified and stored in such a way that it can become a part of the existing knowledge base of the organization. Now, with increasing advancements in technology, organizations can easily codify, digitalize and securely store knowledge with redundancy (Alavi and Leidner, 2001; Lee and Wong, 2015). Hari *et al.* (2004) highlighted the importance of regularly adding new knowledge in the database, while Chaudhury and Bhattacharya (2004) mentioned the importance of deleting useless and outdated knowledge in the database. Lawson (2003) stressed the importance of having a knowledge database that is easy to access for employees. Effective storage of knowledge facilitates quick retrieval of knowledge with the use of advanced search engine (knowledge mining within the databases) (Al-Khouri, 2014).

In the case of the public sector, it is important that employees document and store knowledge electronically, which is then classified, indexed and stored in an electronic data management system (EDMS). For example, in the case of the Dubai Courts, when a judge finalizes a case and announces the verdict, the judge is required to electronically store the case details and explain how they reached a verdict (Biygautane and Al-Yahya, 2010). According to Al-Khouri (2014), one of the knowledge storage mechanisms used by Emirates Identity Authority (EIA), one of the successful public sector entities in UAE, is mandating reports such as project close-out reports, final research reports, seminar reports, staff experience report and best practices/lessons learned report.

2.1.5 Knowledge sharing. It involves the sharing of both tacit and explicit knowledge. While the latter can be shared in formal, systematic language among employees (Nonaka

and Takeuchi, 1995) such as through the intranet, electronic email and shared databases, the former poses a challenge because tacit knowledge sharing is typically voluntary/non-compulsory (Lin *et al.*, 2008). Therefore, to promote employees' willingness to share tacit knowledge with colleagues, Gore and Gore (1999) mentioned that the interaction, which takes place within a team environment such as collaborative problem-solving provides an excellent platform for efficient externalization of an individual's tacit knowledge into organizational knowledge. Studies have shown that informal meeting sessions, where employees are free to share their knowledge, ideas and information with others (Coyte *et al.*, 2012) and informal face-to-face social interactions can encourage the sharing of tacit knowledge (Chong *et al.*, 2011).

To facilitate efficient knowledge sharing, it is important for the organization to use the latest file-sharing system, which is fast and convenient to use (Al-Alawi *et al.*, 2007; Lin, 2007). Organizations should encourage and facilitate employees to share new ideas and knowledge through constructive conversation (Gold *et al.*, 2001; Lawson, 2003). Also, it is important for organizations to share reports and newsletters internally with employees and externally to customers and other external stakeholders, as well as to conduct regular symposiums, lectures, conferences and training sessions to share knowledge (Lawson, 2003). Organizations should also encourage cross-functional teams to promote interdepartmental knowledge sharing (Al-Alawi *et al.*, 2007). He *et al.* (2014) highlighted the importance of team outing and department lunches to encourage informal knowledge sharing.

For the public sector, promoting knowledge sharing is especially important given that the public sector appears to have an embedded culture of not sharing information and knowledge between departments (Bate and Robert, 2002). Even if knowledge sharing is made mandatory, studies have shown that public sector staff is likely to pretend to share knowledge or not share what they think is their more significant or valuable knowledge (APO, 2013). Hence, public sector entities have to come up with innovative ways to promote knowledge sharing. For example, in IES, storytelling is used to share the knowledge and experience of employees (APO, 2013). Dubai police have adopted a Japanese model to promote knowledge sharing in which they have used several mechanisms such as the establishment of cross-organizational and self-managing teams; mandatory weekly employee meeting in the last working day of the week in which employees are required to meet for 2 h to discuss the new techniques they have learned and explained them to the newly joined employees; and organizing regular workshops and lectures for employees to share their experiences and ways in which they dealt with a specific issue (Biygautane and Al-Yahya, 2010).

Dubai Courts also have adopted a very efficient process to share knowledge. For instance, senior judges are required to meet regularly to discuss cases and share their experiences and opinions with others, especially with new judges, to facilitate the skills and expertise of older and more experienced judges to newer ones (Biygautane and Al-Yahya, 2010). In the case of Dubai Roads and Transport Authority (RTA), a state of the art EDMS was created to facilitate the sharing of documents and knowledge among the employees (Biygautane and Al-Yahya, 2011a). RTA also uses mentoring, coaching and informal meetings with external consultants they hired for their projects to maximize knowledge sharing between the external source (consultants) and the employees (Biygautane and Al-Yahya, 2010). In the case of EIA, to facilitate knowledge sharing, they use a "gamified" knowledge sharing process in which employees can earn points for sharing best practices or lessons learned or any content piece they share (Al-Khouri, 2014).

2.1.6 Knowledge utilization. It translates knowledge into action, i.e. using knowledge for decision-making or policy-making. It involves the use and reuse of knowledge in the organization (APO, 2013). Unfortunately, much knowledge remains underused. Knowledge only adds value when it is used for improvement. Organizations, therefore, should encourage employees to use and apply what they know and what they have learned and to use or combine accessible information from the organization's knowledge repository to both solve existing problems and to come up with new products and services to bolster the organization's competitive advantage (Chan and Chao, 2008). Lawson (2003) highlighted the importance of having a mechanism in place to match sources of knowledge to problems. Greiner *et al.* (2007) stressed the need to use knowledge to improve efficiency and competitive advantage. Similarly, Lee and Wong (2015) highlighted the need to encourage employees to apply their knowledge to the development of new products and services or to solve problems. Reagans *et al.* (2016) mentioned the importance of correctly assigning tasks to employees that match their expertise.

As mentioned earlier, the public sector is known for its underutilization of knowledge (Biygautane and Al-Yahya, 2010). According to Al-Yahya (2009), the underutilization levels of knowledge were at 47% in Saudi Arabia, 45% in Oman and 42% in UAE. Therefore, it is crucial for the public sector that employees leverage the knowledge shared with them or access the stored information from knowledge repositories. For example, in the case of Dubai Courts, when judges face a similar case, they examine electronically how previous judges reached a decision on a similar case and build on that (Biygautane and Al-Yahya, 2011a).

However, only minimal studies in the public sector have investigated all or several of the above knowledge management processes. Most of the studies have been mostly fragmented and ad-hoc, investigating only a sub-set of issues in isolation rather than considering all aspects together.

2.2 Operational efficiency

Efficiency is about doing more for less. It involves maximizing outputs such as the volume of services provided, minimizing inputs such as the amount of resources or capital required to produce those services and maintaining or improving quality (Deloitte, 2016; Al-Qubaisi, and Ajmal, 2018). Improving operational efficiency is a core component of any government reform (TGS, 2013). With deep budget cuts, the public sector is now required to improve efficiency at all levels with the most urgent need focused on operational functions (Cisco, 2011). For example, in June 2015, the UK Chancellor announced a total of £4.5bn in cost cutting measures to meet departmental budget targets, with some of the biggest areas of savings coming in operational efficiencies (Capgemini, 2016).

Several aspects make up the operational efficiency in the public sector context. This includes service delivery cycle time, productivity and reduction in day to day organizational expenses as critical measures of operational efficiency for the public sector (Curristine *et al.*, 2007). The other operational efficiency measures identified from the broader literature but relevant for the public sector context are asset utilization (Zhu *et al.*, 2005), lost time due to downtime (Fore and Zuze, 2010) and reduction in departmental project duration (Rusinko, 2007; Zacharia *et al.*, 2009). The other customer-centric measures for operational efficiency are the increase in customer service level (Wang and Wang, 2012) and value generated to customers (Rusinko, 2007; Zacharia *et al.*, 2009).

According to the study conducted by APO (2016) in selected Asian countries on measuring public sector productivity, reduction of turnaround times to complete activities is highlighted as a key factor of operational efficiency. The other essential measures for operational efficiency highlighted in the report include minimizing overall costs, efficient

assets management, labour productivity and customer orientation, such as customer needs, satisfaction and problems (APO, 2016).

As mentioned earlier, UAE, like other governments around the world are continually searching for ways to improve their operational efficiency. This is to avoid wastage of public expenditure and spending and avoid scrutiny from audit bodies, central agencies, expenditure review programmes, political decision makers, media and think tanks (TGS, 2013). The “Organisation for Economic Co-operation and Development (OECD) Government at a Glance 2011” report shows that the operational efficiency of the public sector is on the decline (TGS, 2013). Unfortunately, no comprehensive effort has been taken yet to measure the operational efficiency of the UAE public sector.

The underlying items within each construct for the public sector identified from the literature are summarized in Appendix 1. Though it can be argued that a host of other items could be found in the literature, no other items appeared to be as consistent and relevant in the public sector than those presented in Appendix 1.

2.3 Public sector firm size

The questions that arise in relation to knowledge management and organizational size for private sector organizations are also relevant for the public sector organizations. Unfortunately, despite its significance, all or most of the studies that examined the effects of organizational size’ on knowledge management has been in the private sector. Further, our literature search in Scopus database revealed that there exists a significant gap in understanding the effects of public sector organizational size’ on knowledge management processes. Addressing this gap is critical for ensuring knowledge processes are implemented effectively across all public sector entities regardless of their size and that they are able to achieve the desired operational efficiency gains.

The most common measure for firm size categorization is the number of people employed (OECD, 2020). However, unlike the private sector, we have not come across any clear categorization of public sector firms as small, medium, large and very large based on size. We used the popular classification proposed by OECD for categorizing enterprises as small and medium enterprises (SMEs) (less than 250), large (251–500) and very large (greater than 500) (OECD, 2020). Based on this criteria, it is clear that public sector organizations are of different sizes across federal, state-level and semi-government organizations. Also, differences in size could exist between new and established public sector entities. Also, restructuring of public sector entities such as merging of two public sector entities to create a large entity or creation of a new small public sector entity or breaking a large public sector entity to smaller entities, impacts organizational size. For example, in the wake of COVID-19 pandemic, UAE Government is considering merging government entities for making them more “agile and swift” in decision-making (Reuters, 2020).

2.4 Firm size impact on knowledge management and operational efficiency

2.4.1 Firm size impact on knowledge management processes. As mentioned earlier, we have not come across any studies that have investigated firm size impact on knowledge management in the public sector anywhere, let alone UAE. Limited evidence from the literature from the private sector that looked at firm size impact on knowledge management has reported mixed findings. For instance, Štrach and Everett (2006) reported that organizational size positively influences knowledge distribution. On the contrary, Serenko *et al.* (2007) in Canada found that, as the size of an organizational unit increases, the effectiveness of internal knowledge flows dramatically diminishes and the degree of intra-organizational knowledge sharing decreases. Similarly, Connelly and Kelloway (2003) found a negative relationship

between organizational size and knowledge sharing. However, a comparative study by [Xu et al. \(2005\)](#) between large organizations and SMEs in Australia found no difference in the knowledge management implementation across different-sized firms. This is echoed in the findings of [Kruger and Johnson \(2013\)](#) on South African firms, who found no significant difference in knowledge management between organizations of different sizes.

Overall, evidence from the limited studies shows that organizational size has a nuanced impact on the implementation of knowledge management processes with studies reporting greater, lesser and equal levels of implementation at different-sized firms. Given the lack of consensus in the literature with regard to the impact of firm size on knowledge management processes, we have explored meta-reasons from the broader organizational literature to hypothesize the impact of firm size on knowledge management processes. The two main meta-reasons that could affect the implementation are as follows:

2.4.1.1 Greater resources for large firms' *vis-à-vis* smaller firms. From a resource-based view (RBV) perspective ([Barney, 1991](#)), it could be argued that greater resources of large firms with regard to financial resources, human resources, capabilities and technical and managerial know-how could lead to greater implementation of knowledge management processes that are both resource and time intensive. Further, smaller firms may also suffer from a lack of specialist professionals, given that employees in smaller firms often perform multiple roles ([Kostka et al., 2013](#)). On the contrary, the greater size of large firms facilitates the division of labour and specialization ([Earnhart et al., 2014](#)). In other words, large firms have the advantage of "discretionary slack", the opportunity for managers to use excess time and resources for the implementation of knowledge management processes over smaller firms, who may refrain from allocating their rare and limited resources towards knowledge management processes. In other words, from an RBV standpoint, "liabilities of smallness" is a deterrent to knowledge management processes.

2.4.1.2 Greater simplicity, flexibility and innovation propensity of smaller firms *vis-à-vis* larger firms. Smaller firms' have advantages over larger firms because of their simplified and faster decision-making process, greater structural and strategic flexibility, creativity and greater innovation propensity ([Dean et al., 1998](#); [Noci and Verganti, 1999](#); [Darnall et al., 2010](#)). Also, smaller firms are less bureaucratic than larger firms, and therefore, have the advantage of greater internal coordination and communication to implement knowledge management processes and are poised to innovate in ways that larger firms cannot ([Darnall et al., 2010](#)). On the other hand, large firms are more bureaucratic, and therefore, suffers from "organizational inertia" ([Aldrich and Auster, 1986](#)), which impedes their creativity and innovation ability, and therefore, are reluctant to adopt practices they are less familiar with that might disrupt their status-quo ([King and Shaver, 2001](#); [Grant et al., 2002](#)).

Based on the meta-reasons mentioned above, it could be argued that knowledge management processes, namely, knowledge acquisition, knowledge creation and knowledge capture, will be higher for large firms *vis-à-vis* smaller firms given their greater resources and economies of scale and scope. However, it could be argued that knowledge storage and retrieval, knowledge sharing, knowledge utilization will be greater for small firms' *vis-à-vis* large firms given their structural simplicity, strategic flexibility and greater creativity and innovation propensity. Hence, we make the following hypotheses:

- H1a. Knowledge acquisition will be greater for large public sector entities *vis-à-vis* small and medium public sector entities.
- H1b. Knowledge acquisition will be greater for very large public sector entities *vis-à-vis* large public sector entities.

- H1c.* Knowledge acquisition will be greater for very large public sector entities vis-à-vis small and medium public sector entities.
- H2a.* Knowledge creation will be greater for large public sector entities vis-à-vis small and medium public sector entities.
- H2b.* Knowledge creation will be greater for very large public sector entities vis-à-vis large public sector entities.
- H2c.* Knowledge creation will be greater for very large public sector entities vis-à-vis small and medium public sector entities.
- H3a.* Knowledge capture will be greater for large public sector entities vis-à-vis small and medium public sector entities.
- H3b.* Knowledge capture will be greater for very large public sector entities vis-à-vis large public sector entities.
- H4a.* Knowledge storage and retrieval will be greater for small and medium public sector entities vis-à-vis large public sector entities.
- H4b.* Knowledge storage and retrieval will be greater for large public sector entities vis-à-vis very large public sector entities.
- H4c.* Knowledge storage and retrieval will be greater for small and medium public sector entities vis-à-vis very large public sector entities.
- H5a.* Knowledge sharing will be greater for small and medium public sector entities vis-à-vis large public sector entities.
- H5b.* Knowledge sharing will be greater for large public sector entities vis-à-vis very large public sector entities.
- H5c.* Knowledge sharing will be greater for small and medium public sector entities vis-à-vis very large public sector entities.
- H6a.* Knowledge utilization will be greater for small and medium public sector entities vis-à-vis large public sector entities.
- H6b.* Knowledge utilization will be greater for large public sector entities vis-à-vis very large public sector entities.
- H6c.* Knowledge utilization will be greater for small and medium public sector entities vis-à-vis very large public sector entities.

2.4.2 Firm size impact on operational efficiency. We expect greater operational efficiency at larger firms, given that large firms *vis-à-vis* smaller firms will have clearer specifications of goals, use of more formalized organizational procedures and performance measures and greater access to resources to monitor, report and control performance (Vijayvargy *et al.*, 2017). Previous studies have shown that the use of performance indicators to track and monitor performance is more profound at larger firms than at smaller firms (Henriques and Sadorsky, 2006). Further, large firms generally have more resources to invest in performance measurement systems as part of their administratively-oriented control strategy for the evaluation of managerial performance (Henri and Journeault, 2008). Hence, we propose the following hypotheses:

- H7a. Operational efficiency will be greater for large public sector entities vis-à-vis small and medium public sector entities.
- H7b. Operational efficiency will be greater for very large public sector entities vis-à-vis large public sector entities.
- H7c. Operational efficiency will be greater for very large public sector entities vis-à-vis small and medium public sector entities.

2.5 Firm size impact on the relationship between knowledge processes and operational efficiency

As the high extent of knowledge management processes does not necessarily contribute to high performance, assessing the relationships between knowledge management processes and operational efficiency is important to understand how much variance in operational efficiency is explained by each knowledge management processes. This would help practitioners and policymakers to gauge the efficiency and effectiveness of their knowledge management processes in line with their operational efficiency goals.

Studies have shown that knowledge management processes can improve the operational performance of public sector firms (Al Yami and Ajmal, 2019). For instance, knowledge management initiatives have improved the internal efficiency and productivity of the Dubai Water and Electricity Authority and Dubai Courts (Biyyautane and Al-Yahya, 2011). Also, the Malaysian Agricultural Research and Development Institute has significantly improved productivity through the implementation of knowledge creation, knowledge sharing and knowledge capture and storage (APO, 2013). These technologies are then shared with farmers to improve their productivity in farming, and employees are also encouraged to document and share their expertise and knowledge through journal publications. In the case of the Korean Customs Service, effective knowledge management initiatives facilitated the organization to achieve savings of 500 million (in local currency) by developing an active recycling programme for counterfeit shoes, as well as reduce travelers' luggage clearance time from 50 min in 1998 to 28 min in 2010 through the implementation of an advanced customs and logistics system (APO, 2013).

Unfortunately, little is known with regard to the firm size influence on the relationship between knowledge management and operational efficiency in any sector, let alone in the public sector. However, looking at the generic literature on the relationship between knowledge management processes and performance outcomes derived from it, a recent study by Oyoo (2019) found that firm size moderates the relationship between strategic knowledge management practices and non-financial performance. In other words, the study found the relationship to be stronger for large firms *vis-à-vis* smaller firms. However, Daud (2012) found a more nuanced impact of firm size on the relationship between knowledge management processes and firm performance. The study on the relationship between knowledge management and firms' financial and non-financial performance shows knowledge acquisition is the main contributor to financial performance for SMEs, while knowledge application is the main contributor for large firms. For non-financial performance, the study found that knowledge application is the main contributor for SMEs while knowledge conversion is the main contributor for large firms (Daud, 2012).

Based on the broader organizational literature, it could be argued that the relationship between knowledge management processes and operational efficiency will be greater for large firms *vis-à-vis* smaller firms. This is largely because of the "economies of scale" and "economies of scope" benefits enjoyed by large firms (Gil *et al.*, 2001; Tambunlertchai *et al.*, 2013).

According to [Gil et al. \(2001\)](#), the synergistic effect of economies of scale and scope, and the existence of slack resources are higher for large firms *vis-à-vis* smaller firms. On the contrary, the smaller firms may not have the economies of scale benefits with regard to performance improvements to justify investment in knowledge management initiatives. For instance, for smaller firms, the day to day operational expense reductions may be so insignificant that they provide little incentive to introduce knowledge management initiatives. Hence, we propose the following hypotheses:

- H8a.* Impact of knowledge management processes on operational efficiency will be greater for large public sector entities vis-à-vis small and medium public sector entities.
- H8b.* Impact of knowledge management processes on operational efficiency will be greater for very large public sector entities vis-à-vis large public sector entities.
- H8a.* Impact of knowledge management processes on operational efficiency will be greater for very large public sector entities vis-à-vis small and medium public sector entities.

[Figure 1](#) summarizes the hypotheses mentioned above and constructs considered in this study in the form of a conceptual framework.

3. Research method

A survey-based research methodology was used in this study. The underlying items within each construct identified from the literature ([Table 1](#)) were organized in the form of a self-administered survey questionnaire. A five-point Likert measurement scale ranging from

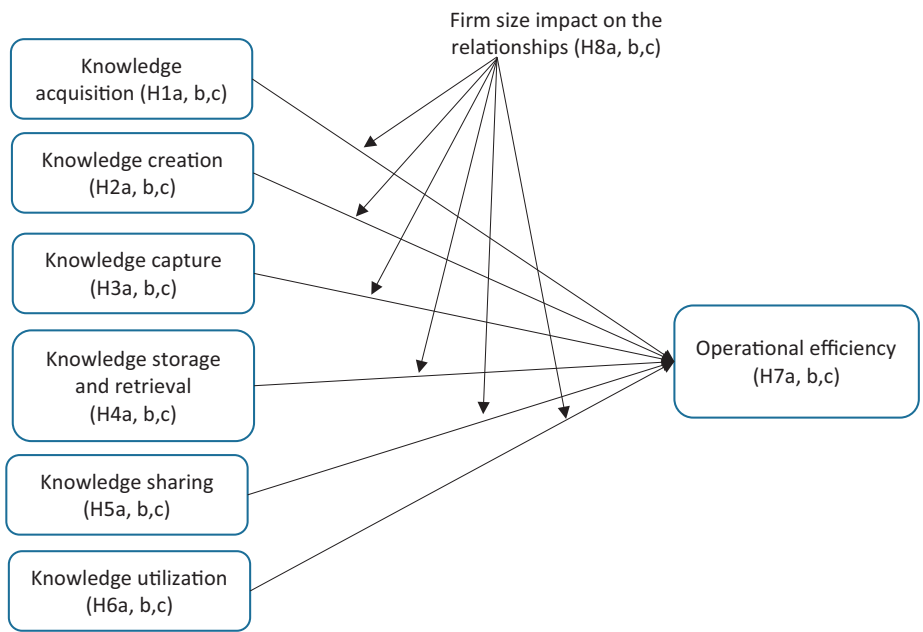


Figure 1.
Conceptual
modelNote: *Mean
score is measured on
a scale of 1–5.

strongly agree (5) to strongly disagree (1) was used to evaluate the main constructs in the study. The survey instrument was then pre-tested with six experts (three academics and three senior employees) in the field. This met the condition outlined by Ghauri and Gronhaug (2002), who recommended that a questionnaire should go through a pre-test of at least three to five respondents. The pre-test process with the participants involved checking the appropriateness of the questions, evaluating the readability/choice of terminology, assuring clarity/ease of understanding, and the relevance of the items in real-world situations. The suggestions from the pre-test respondents were then incorporated into the study. After the pre-test, a pilot test was conducted to identify and address issues that might affect the completion of the final questionnaire during the main study (Dillman, 1978). The pilot survey provided insights into several aspects such as “the time take to complete the survey”, “the response rate”, “the completion rate”, “the questions skipped” and “comments/feedback” for improvement. The insights were useful in the planning and administration of the main survey.

The main survey was administrated for a period of four months starting from December 2018 till March 2019, using Qualtrics, an online survey system. Initially, more than 100 public sector organizations from the Government.ae website was approached to participate in the study (Government.ae, 2019). After getting the necessary approvals, the country-wide survey was sent to 30 public sector organizations in the UAE, which include both federal and state-level entities. Also, efforts were taken to target mid-level to senior-level managers in the organization. A total of 438 responses were received. However, close scrutiny, of the 438 responses, 55 inappropriate responses were removed due to incompleteness, and for having low engagement with the survey (pattern responses with short completion time) leaving 383 valid and usable responses for data analysis. The demographic characteristics of the final responses are shown in Table 2.

As seen in the table, organization size based on employee numbers were recorded. These were classified into small and medium entities (0–250 employees) and large entities (> 250 employees) categories. A comparable split of responses was received with regard to firm size

Demographics	Responses	(%)
<i>Size (employees)</i>		
Less than 250	200	52
251–500	106	28
501–2,000	38	10
Greater than 2,000	39	10
Total	383	100
<i>Respondents experience (in year) in the public sector</i>		
0–2	25	7
3–5	36	9
6–10	67	17
>10	254	67
Total	383	100
<i>Respondents experience (in year) in the current organization</i>		
0–2	79	21
3–5	70	18
6–10	126	33
>10	108	28
Total	383	100.0

Table 2.
Classification of
survey
respondents T

(less than 250 employees – 52%; and greater than 250 employees – 48%). Further, with regard to the experience of the respondents, as seen in the table, 67% had more than 10 years of experience in the public sector and 84% had 6 or more years of experience. This was not surprising given that effort has been taken during data collection to target senior managers. Finally, with regard to the experience of the respondents in the current organization, more than 60% of the respondents have six or more years of experience. Given the wealth of experience of the respondents in the public sector, and in the current organization, the quality of responses, in general, was presumed to be high.

4. Analysis and findings

However, before proceeding with the analysis, we checked for the following to ensure data and construct validity.

4.1 Common method bias

To eliminate common method bias (problem that occurs when one respondent answers all of the self-reported questionnaire involving multiple constructs), prior to data collection, procedural remedies suggested by Podsakoff *et al.* (2003) such as informing respondents about the data confidentiality and anonymity were used to prompt honest answers from the respondents. Harman's single factor test as recommended by Podsakoff *et al.* (2003) post-data collection shown that common method bias was not an issue in this study.

4.2 Non-response bias

To test for non-response bias, responses of early respondents were compared to that of late respondents, with the underlying assumption that the opinions of late respondents were representative of the views of the theoretical non-respondents (Rogelberg and Stanton, 2007). The *t*-test revealed no significant difference between the two groups for all the items, indicating that non-response bias was not a problem in this study (Armstrong and Overton, 1977).

4.3 Construct validity

Convergent validity and discriminant validity were conducted to test the validity of the constructs (four constructs of knowledge management processes and operational efficiency).

Convergent validity was carried out using confirmatory factor analysis (CFA). The results of CFA showed that factor loadings (which indicate the correlation between the individual items and the corresponding construct) of items were well above the recommended threshold of 0.5, thereby demonstrating strong convergent validity of all constructs (Anderson and Gerbing, 1988). The results of the CFA are given in Appendix 2.

Discriminant validity refers to the degree to which measurement items of constructs that theoretically should not be related to each other are, in fact, not related to each other (Trochim, 2006). According to Kline (2005), the correlation of items representing different constructs should be below the upper threshold of 0.85. In this study, the correlation between the items representing different constructs was well below 0.85 in most cases. Also, as seen in Appendix 3, the square root of the average variance extracted (AVE) was either above or comparable with each pairwise correlation between the constructs (Fornell and Larcker, 1981). Both the results show reasonable discriminant validity.

4.4 Reliability of constructs

Cronbach's alpha was used to measure the reliability of the constructs. The reliability scores obtained for all seven constructs were above 0.7, the acceptable threshold for reliability (Nunnally and Bernstein, 1994).

Next, in line with the research questions (*RQ1* and *RQ2*), the impact of firm size on each knowledge management processes and operational efficiency was understood by comparing the results of small and medium public sector entities, and large public entities.

Analysis of variance (ANOVA) was conducted to assess the underlying differences in knowledge management processes and operational efficiency between the two size categories. International business machines (IBM) statistical package for the social sciences 24 software was used for the analysis. Table 3 shows the results of ANOVA for *RQ1* and *RQ2*.

Next, in line with *RQ3*, to test the differences in the individual relationships and their corresponding hypotheses, structural equation modelling (SEM) using IBM AMOS 24 software was used to first estimate the structural relationships (standardized path coefficients) across different firm size categories. The standardized path coefficients for the different categories are given in Table 4. Next, to test whether these differences in path coefficients were statistically significant across different-size firms, a multi-group moderation test was used. In this case, Z-score was used to determine the impact of organizational size on the relationships between any two size categories. Previous studies have shown that Z-test is adequate to put into practice of multi-group analysis (Afthanorhan *et al.*, 2014, 2015). The Z-score was computed with the aid of the stats tools package (Gaskin, 2016) using AMOS output of critical ratio of differences in parameters and the unstandardized regression coefficients of the two groups (Afthanorhan *et al.*, 2014). Previous studies in knowledge management have also used a similar approach to identify differences in structural relationships across different categories. For example, Balasubramanian *et al.* (2019) used SEM and multi-group moderation tests to investigate the impact of ownership of public sector organizations (federal, state and semi-government organizations) on the implementation of knowledge management (KM) processes.

Table 4 shows the strength of the relationships (standardized path coefficients) between knowledge management processes and operational efficiency for small and medium, and large public sector categories. The Z-score values greater than 1.96 (p -values < 0.05) shows a significant difference in the relationships between the two size categories (Afthanorhan *et al.*, 2014).

5. Discussion of findings

The findings related to the RQ and associated hypotheses are discussed in this section.

5.1 Impact of firm size on knowledge management processes (research question 1 and associated hypotheses 1–hypotheses 6)

As seen in Table 3, all knowledge management processes implementation were found to be higher for large public sector entities followed by small and medium entities, and very large entities. However, the differences in all the knowledge management processes implementation between small and medium entities and large entities are not statistically significant. Hence, none of the hypotheses *H1a–H6a* is supported. Also, none of the hypotheses *H1b–H6b* is supported. This is because, contrary to the proposed hypotheses, knowledge management process implementation is greater for large entities than very large entities. In fact, for two of the knowledge management processes, namely, knowledge acquisition and knowledge creation, this difference was found to be significant. Also, no

Table 3.
Descriptive statistics
and comparison of
knowledge
management
processes,
operational efficiency
in public sector
entities of different
sizes

Knowledge management constructs	Group 1 – small and medium Size (0–250) (N = 200)		Group 2 – large Size (251–500) (N = 106)		Group 3 – very large Size (>500) (N = 77)		Comparison among three groups			Overall F score	Hypothesis test result
	Mean (1–5)	SD	Mean (1–5)	SD	Mean (1–5)	SD	1 and 2 p-value	2 and 3 p-value	1 and 3 p-value		
Knowledge acquisition	3.97	0.69	4.11	0.69	3.74	0.92	0.224	0.031*	0.069	5.514**	H1 not supported
Knowledge creation	3.76	0.91	3.90	0.79	3.51	1.06	0.422	0.013*	0.101	4.091*	H2 not supported
Knowledge capture	3.84	0.81	3.94	0.76	3.75	0.83	0.625	0.280	0.657	1.173	H3 not supported
Knowledge storage and retrieval	3.56	0.94	3.72	0.84	3.65	0.86	0.269	0.858	0.704	1.257	H4 not supported
Knowledge sharing	3.74	0.83	3.90	0.76	3.75	0.96	0.248	0.999	0.431	1.386	H5 not supported
Knowledge utilization	3.79	0.85	3.85	0.81	3.67	0.93	0.810	0.543	0.321	1.051	H6 not supported
Operational efficiency	3.70	0.75	3.79	0.68	3.63	0.87	0.537	0.767	0.304	1.146	H7 not supported

Notes: Scale 1–5; * $p < 0.05$; ** $p < 0.01$

Notes: Scale 1–5; ^{*}p < 0.05; ^{**}p < 0.01

Structural relationships between knowledge management processes and operational efficiency Leads to	Group 1 – small and medium		Group 2 – large		Group 3 – very large		Comparison among three groups		
	Size (0–250) (N = 200)		Size (251–500) (N = 106)		Size (>500) (N = 77)		1 and 2	2 and 3	1 and 3
	Estimate		Estimate		Estimate		z-score	z-score	z-score
Knowledge acquisition	0.726**		0.647**		0.846**		–0.223	2.046*	0.544
Knowledge creation	0.707**		0.631**		0.845**		–0.158	2.144*	1.214
Knowledge capture	0.723**		0.581**		0.823**		–2.103*	3.312**	1.091
Knowledge storage and retrieval	0.687**		0.617**		0.744**		–0.112	0.919	0.318
Knowledge sharing	0.713**		0.663**		0.816**		–0.171	2.222*	0.998
Knowledge utilization	0.766**		0.670**		0.835**		–0.625	2.088*	0.443
							H8 partially supported		

Notes: * p -value < 0.05; ** p -value < 0.01

Table 4.
Comparison of the
relationships
between knowledge
management
processes and
operational efficiency
in public sector
entities of different
sizes

statistically significant difference in implementation was found between small and medium entities and very large entities, and hence, *H1c–H6c* is not supported. Overall, as seen in [Figure 2](#), the knowledge management processes score (average of individual knowledge management processes) and organizational size follows an inverted “V” pattern, in which, knowledge management processes was found to increase while transitioning from small and medium entities (mean score of 3.77 out of 5.00) to large entities (mean score of 3.89 out of 5.00), but was found to decrease while transitioning from large to very large entities (mean score of 3.67 out of 5.00). Overall, it could be argued that there is plenty of scope for improvement for all public sector entities as none of the firm size category had a knowledge management score above 4.00 on a 5.00 point scale.

The likely reason for this could be that, very large firms are more bureaucratic, and therefore, suffers from “organizational inertia” ([Aldrich and Auster, 1986](#)), which impedes their creativity and innovation ability, and therefore, are reluctant to adopt practices they are less familiar with that might disrupt their status-quo despite having greater resources ([Grant et al., 2002](#)). This implies that small and medium entities and very large entities require more support for improving all their knowledge management processes.

5.2 Impact of firm size on public sector operational efficiency (research question 2 and associated hypothesis – hypotheses 7)

As seen in [Figure 3](#), an inverted “V” pattern is witnessed for operational efficiency as well. Operational efficiency was found to be higher for large public sector entities (mean score of 3.79 out of 5.00) followed by small and medium entities (means core of 3.70 out of 5.00) and very large entities (mean score of 3.63 out of 5.00). However, the difference in operational efficiency between small and medium entities and large entities is not significant. Hence, *H7a* is not supported. Also, *H7b* is not supported. This is because, contrary to the proposed hypotheses, operational efficiency is greater for large entities than very large entities. Also, no significant difference in operational efficiency was found between small and medium

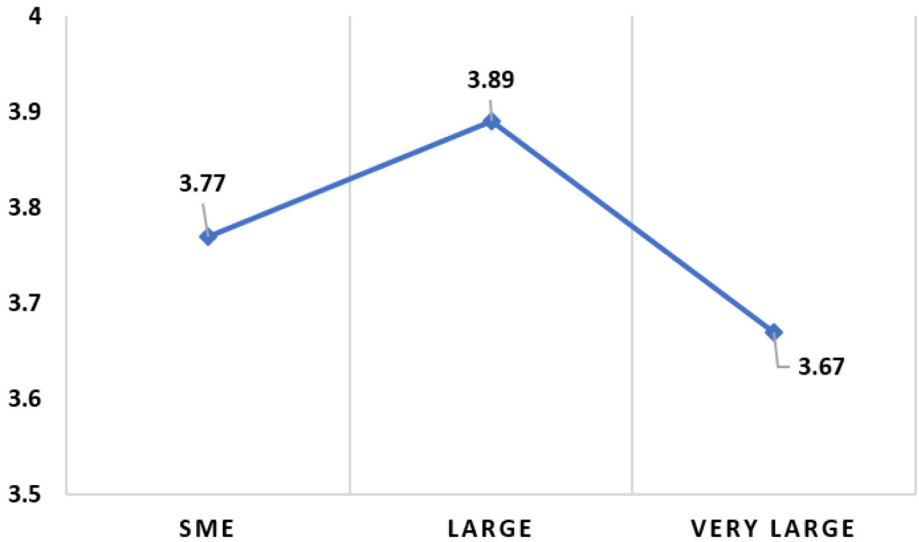
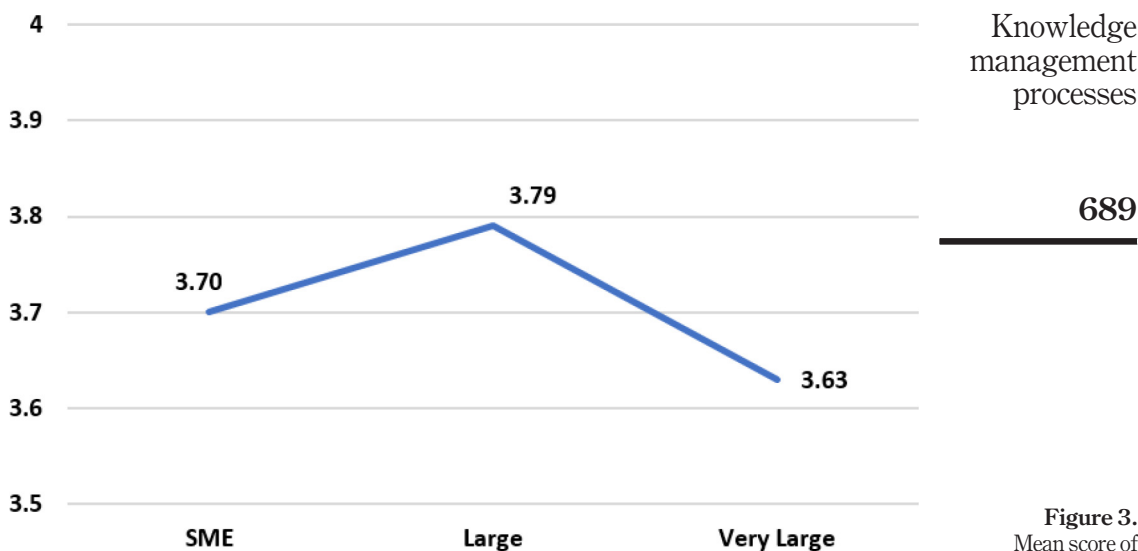


Figure 2.
Overall mean score of
knowledge
management
processes

Note: *Mean score is measured on a scale of 1–5



Note: *Mean score is measured on a scale of 1–5

Figure 3.
Mean score of
operational efficiency

entities and very large entities, and hence, *H7c* is not supported. This implies that, again, small and medium entities and very large entities require more support for improving their operational efficiency. Still, it could be argued that there is plenty of scope for improvement for all public sector entities as none of the firm size category had an operational efficiency score above 4.00 on a 5.00-point scale.

5.3 Impact of firm size on the structural relationships between knowledge management processes and operational efficiency (research question 3 and associated hypotheses – hypotheses 8)

In terms of relationships, as seen in Table 4, regardless of size, all knowledge management processes had a significant positive impact on the operational efficiency of the public sector. The standardized regression coefficient (β) has been consistently moderate to high (ranging between 0.581–0.846) across the different size categories. This further reiterates the importance of knowledge processes for improving operational efficiency. However, in terms of differences in the relationship across different firm sizes, our proposed *H8* is only partially supported. This is because, contrary to our assumption, the structural relationships between all knowledge management processes and operational efficiency were found to be higher for small and medium entities *vis-à-vis* large entities. Hence, *H8a* is not supported. This could be because of small and medium entities simplified and faster decision-making process, greater structural and strategic flexibility, creativity and greater innovation propensity (Dean *et al.*, 1998; Noci and Verganti, 1999; Darnall *et al.*, 2010). On the other hand, as the organizational size increases, very large firms have the advantage of “discretionary slack” and greater opportunities to benefit from operational efficiency from knowledge management processes. The impact of knowledge management processes on operational efficiency was found to be greater for very large public sector entities *vis-à-vis* large public sector entities. Therefore, *H8b* is supported with the exception of knowledge

storage and retrieval. Finally, no significant difference was found in the strength of the relationship between the knowledge management process and operational efficiency between small and medium entities, and large entities. Hence, *H8c* is not supported. In sum, the ability to derive operational efficiency from knowledge management processes was found to be the highest for very large public sector organizations followed by small public sector organizations.

6. Implications and conclusions

Today, knowledge management initiatives for the public sector is no longer a choice but an imperative if the respective country wishes to stay competitive globally (Misra, 2007). Given that all public sector organizations regardless of their size, are under increasing pressure from society to innovate, reduce spending and maintain or enhance the quality of services provided to citizens, this study is timely and is expected to enhance the application of knowledge management processes and subsequent operational performance in the public sector. Given that none of the previous studies have assessed the impact of firm size of public sector organizations on the knowledge management processes and subsequent operational efficiency, the findings of this study are both novel and significant.

The study has several implications. In terms of practical implications, the results show the extent of implementation of all six knowledge management processes, and operational efficiency follows an inverted “V” pattern, in which, both knowledge management processes and operational efficiency was found to increase while transitioning from small and medium entities to large entities, but was found to decrease while transitioning from large to very large entities. This shows that as size increases from large to very large, the greater rigidity and organizational inertia of very large firms could stifle the implementation of knowledge management processes and their ability to achieve operational efficiency. On the other hand, relatively lower knowledge management processes of smaller firms could be attributed to smaller firms lack of know-how, and the fact that they are resource disadvantaged.

Practitioners and policymakers in the UAE and elsewhere overseeing national-level knowledge management initiatives must provide extra attention to ensure very large public sector entities are implementing knowledge management processes at the same level that of other entities. Similarly, with regard to operational efficiency, again, both small and medium public sector entities and very large public sector entities are behind large entities, and hence, require strategic intervention to improve their efficiency.

Finally, with regard to the relationships between knowledge management processes and operational efficiency, the findings in general shows that knowledge management processes can improve the operational efficiency of public sector organizations, and therefore, should provide an impetus for all public sector organizations regardless of their size to implement knowledge management processes to improve operational efficiency. However, the ability to derive operational efficiency from knowledge management processes was found to be the highest for very large public sector organizations followed by smaller organizations. The likely explanation for a stronger relationship between knowledge management processes and operational efficiency is because very large firms tend to have slack resources, a more administratively-oriented control strategy, which means more structured activities, more formalized communication and greater use of standardized information for evaluating knowledge management processes and its effectiveness as a part of organizational routines. On the other hand, the relatively greater or comparable relationship between knowledge management processes and operational efficiency for small and medium organizations to that of large organizations is likely because they are nimble with simpler decision-making processes and greater flexibility and propensity for innovation.

Overall, the differences identified in this study across public sector organizations of different sizes is important for practitioners and policymakers to make prioritized actions, strategies and policy interventions to ensure the success of knowledge management initiatives, and that knowledge all management processes are achieving the desired operational efficiency goals across all different government entities regardless of size. The findings also have implication when merging two public sector entities to create a large entity or creating a new small public sector entity or breaking a large public sector entity to smaller entities, as these decisions will decide their entity size, which, in turn, will influence their knowledge management processes and operational efficiency.

While this quantitative investigation was able to understand the impact of organizational size on knowledge management processes and operational efficiency, the study was unable to explain the “why” and “how” aspects with regard to the differences identified in the study. An in-depth qualitative investigation is required to unearth the reasons for this difference among different public sector entities.

In terms of research contribution, this study is arguably the first comprehensive attempt to understand the influence of firm size on knowledge management process in the public sector domain. The study, therefore, fills the theoretical and empirical void in the literature. Researchers in the UAE and elsewhere could use the study framework and survey instrument to assess the current state of KM processes, operational efficiency and the relationship between them.

In terms of theoretical implications, the study raises an important question of “does the size of public sector entity matter”? Given the difference in size among federal, state-level and semi-government organizations, management initiatives such as knowledge management, may not be equally effective unless the size implications are understood and accounted for. The study findings to some extent, support the notion that public sector entity size does matter in the implementation of management practices such as knowledge management and the performance benefits/outcomes realized from its implementation. The findings from this study are expected to generate significant interest within the research community and among practitioners to explore further the impact of firm size on public sector management.

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Further reading

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Knowledge management processes	References
<i>Knowledge acquisition</i>	
My organization actively gather information on the best practices and trends in the sector (KACQ_01)	Gold <i>et al.</i> (2001), Jantunen (2005)
My organization actively gather information on their competitors (KACQ_02)	Lee and Yang (2000), Gold <i>et al.</i> (2001); Lee and Choi (2003)
My organization actively gather information from all departments (KACQ_03)	Gold <i>et al.</i> (2001)
My organization actively gather information on the internal operations (such as what succeeded and what failed) (KACQ_04)	Gold <i>et al.</i> (2001)
My organization actively gather information on the market/ customer needs (KACQ_05)	Yli-Renko <i>et al.</i> (2001); Lee and Choi (2003)
My organization encourages employee suggestions and feedback (KACQ_06)	Lee and Choi (2003)
My organization encourages customer suggestions and feedback (KACQ_07)	Yli-Renko <i>et al.</i> (2001)
<i>Knowledge creation</i>	
My organization rewards employees for new ideas and knowledge (KCRT_01)	Lawson (2003)
My organization facilitates the development of new ideas through constructive dialogue among employees (KCRT_02)	Alavi and Leidner (2001), Parjanen (2012)
My organization encourages employees to experiment with new ideas and concepts (KCRT_03)	Dermol (2013)
My organization has mechanisms in place to evaluate the value of new ideas and concepts (KCRT_04)	Gold <i>et al.</i> (2001)
My organization has mechanisms in place to combine existing and new concepts in a meaningful way (KCRT_05)	Gold <i>et al.</i> (2001); Lawson (2003)
<i>Knowledge capture</i>	
In my organization, existing knowledge is captured in the form of department reports, meeting minutes, training manuals, handbooks, etc. (KCAP_01)	White and Cohan (2016)
In my organization, employees are required to document their work (KCAP_02)	Hari <i>et al.</i> (2004)
In my organization, mechanisms are in place to capture employee work documents and communications (KCAP_03)	Hari <i>et al.</i> (2004)
In my organization, any new knowledge is documented in written form (KCAP_04)	Hari <i>et al.</i> (2004)
In my organization, mechanisms are in place to patent and copyright new knowledge (KCAP_05)	Lawson (2003)
<i>Knowledge storage and retrieval</i>	
In my organization, captured knowledge is codified and is stored in the company's knowledge repositories (KS&R_01)	Alavi and Leidner (2001); Lee and Wong (2015)
In my organization, advanced databases are used for storage (KS&R_02)	Alavi and Leidner (2001)
In my organization, new knowledge is regularly added to the knowledge database (KS&R_03)	Hari <i>et al.</i> (2004)

(continued)

Table A1.
Constructs and items
identified from the
literature

Knowledge management processes	References
Organizations regularly delete useless and iterative knowledge in the database (KS&R_04)	Chaudhury and Bhattacharya (2004)
Employees can access the database and repository conveniently (KS&R_05)	Lawson (2003)
<i>Knowledge sharing</i>	
My organization uses the latest files sharing systems to share knowledge efficiently (KSHR_01)	Al-Alawi <i>et al.</i> (2007), Lin (2007)
My organization facilitates creative and constructive conversation among employees (KSHR_02)	Gold <i>et al.</i> (2001)
My organization employees are encouraged to share their new ideas and concepts with others (KSHR_03)	Lawson (2003), Al-Alawi <i>et al.</i> (2007)
My organization sends out timely reports and newsletters to employees, customers and other relevant organizations (KSHR_04)	Lawson (2003)
My organization conducts regular symposiums, lecturers, conferences and training sessions to share knowledge (KSHR_05)	Lawson (2003)
My organization cross-functional teams from different departments are created to facilitate knowledge sharing (KSHR_06)	Al-Alawi <i>et al.</i> (2007)
My organization encourages team outing, department lunches, etc. to encourage informal knowledge sharing (KSHR_07)	He <i>et al.</i> (2014)
<i>Knowledge utilization</i>	
My organization has mechanisms in place to match sources of knowledge to problems (KUTL_01)	Lawson (2003)
My organization has mechanisms in place to correctly assigns tasks to employees that match with their expertise (KUTL_02)	Reagans <i>et al.</i> (2016)
My organization use knowledge to respond to the changing competitive environment (KUTL_03)	Greiner <i>et al.</i> (2007)
My organization use knowledge to improve efficiency (KUTL_04)	Greiner <i>et al.</i> (2007)
My organization is not reluctant to use new knowledge into product/services (KUTL_05)	Lee and Wong (2015)
My organization employees are encouraged to apply their new ideas into practice (KUTL_06)	Lee and Wong (2015)
My organization employees are encouraged to apply their knowledge to solve problems (KUTL_07)	Lee and Wong (2015)
<i>Operational efficiency</i>	
Service delivery cycle time has reduced (OPRE_01)	Curristine <i>et al.</i> (2007)
Utilization of assets has improved (OPRE_02)	Zhu <i>et al.</i> (2005)
Time lost due to maintenance/repair (downtime) has reduced (OPRE_03)	Fore and Zuze (2010)
Duration of departmental projects has reduced (OPRE_04)	Rusinko (2007); Zacharia <i>et al.</i> (2009)
Day to day organizational expenses has reduced (OPRE_05)	Cong and Pandya (2003), Curristine <i>et al.</i> (2007)
The employee productivity has increased (OPRE_06)	Curristine <i>et al.</i> (2007)
Customer service level has been improved (OPRE_07)	Wang and Wang (2012)
Value generated to our customers has increased (OPRE_08)	Rusinko (2007); Zacharia <i>et al.</i> (2009)

Table A1.

Appendix 2. Results of confirmatory factor analysisKnowledge
management
processes

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Constructs and items	KACQ	KCRT	KCAP	KS&R	KSHR	KUTL	OPRE	SUSD
<i>Knowledge acquisition (KACQ)</i>								
KACQ_01	0.76							
KACQ_02	0.60							
KACQ_03	0.78							
KACQ_04	0.81							
KACQ_05	0.75							
KACQ_06	0.83							
KACQ_07	0.85							
<i>Knowledge creation (KCRT)</i>								
KCRT_01		0.82						
KCRT_02		0.90						
KCRT_03		0.91						
KCRT_04		0.90						
KCRT_05		0.91						
<i>Knowledge capture (KCAP)</i>								
KCAP_01			0.80					
KCAP_02			0.73					
KCAP_03			0.82					
KCAP_04			0.89					
KCAP_05			0.77					
<i>Knowledge storage and retrieval (KS&R)</i>								
KS&R_01				0.86				
KS&R_02				0.87				
KS&R_03				0.93				
KS&R_04				0.84				
KS&R_05				0.84				
<i>Knowledge sharing (KSHR)</i>								
KSHR_01					0.85			
KSHR_02					0.89			
KSHR_03					0.86			
KSHR_04					0.79			
KSHR_05					0.74			
KSHR_06					0.80			
KSHR_07					0.72			
<i>Knowledge utilization (KUTL)</i>								
KUTL_01						0.82		
KUTL_02						0.86		
KUTL_03						0.90		
KUTL_04						0.92		
KUTL_05						0.84		
KUTL_06						0.91		
KUTL_07						0.89		
<i>Operational efficiency (OPRE)</i>								
OPRE_01							0.67	
OPRE_02							0.78	
OPRE_03							0.69	
OPRE_04							0.71	
OPRE_05							0.72	
OPRE_06							0.88	
OPRE_07							0.82	
OPRE_08							0.87	

Table A2.
First order-
confirmatory factor
loadings of
knowledge
management
processes and
operation efficiency

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Table A3.
Average variance
extracted (AVE) and
correlation between
constructs

Construct	Square root of AVE	KCRT	KCAP	KS&R	KSHR	KUTL	OPRE	SUSD
KACQ	0.79	0.78	0.75	0.68	0.76	0.77	0.74	0.75
KCRT	0.89	–	0.79	0.71	0.81	0.82	0.73	0.76
KCAP	0.81		–	0.82	0.83	0.85	0.71	0.74
KS&R	0.87			–	0.79	0.78	0.67	0.69
KSHR	0.81				–	0.89	0.72	0.77
KUTL	0.88					–	0.76	0.82
OPRE	0.77						–	0.83

Note: All correlations significant at $p < 0.01$

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