
Fusing Knowledge Management into the Public Sector: a Review of the Field and the Case of the Emirates Identity Authority

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Organizations worldwide are showing increasing interest in knowledge management practices to address the contemporary challenges of today's digital age. Knowledge is becoming a critical core asset to sustain competitive advantage and as a vehicle for continuous improvement and innovation. However, most of the developments in the knowledge management field are driven by international organizations or private commercial companies. Considering the impact of knowledge management practices, government organizations have the potential for significant improvements in performance, transformation, and the development of a more responsive citizen-centric government.

This article has two objectives: The first is to provide an overview of knowledge management and highlight the importance of this field of practice, and the second is to provide a case study of the successful implementation of knowledge management in a federal government organization in the United Arab Emirates. This article outlines the adopted approach and framework and elaborates on each of the implemented components. The presented case study and lessons learned are benchmarks for best practices and contribute to the existing experimental cases. This, in turn, should help organizations and researchers to better understand how public sector government organizations perceive and practicing knowledge management, which should enable them to reflect and propose improvements.

Keywords: *knowledge management, organizational excellence, public sector, organizational learning, public sector, competitiveness.*

Introduction

“The control of knowledge is the crux of tomorrow’s worldwide struggle for power in every human institution.” Alvin Toffler

Organizational competitiveness and decision-making capabilities today are very much reliant on the knowledge base. The stronger the knowledge base, the higher the chances of decisions to address the complex and unpredictable forces shaping competitive business conditions (van Winkelen and McKenzie, 2010; Figure 1).

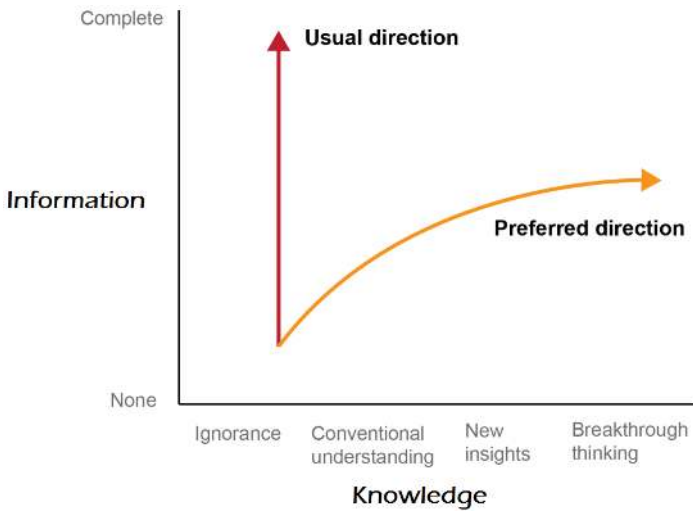


Figure 1: Differences between information and knowledge when making decisions

This requires organizations to capture and streamline all their knowledge and piece it together systematically to create a knowledge pool that can be used to facilitate better and more informed decisions. This

knowledge-based¹ perspective builds upon and extends the resource-based² theory of the firm. Such a knowledge-building approach is based on the view that sustainable success comes predominantly from constructing and consolidating distinctive resources and capabilities (Barney, 1991; Prahalad and Hamel, 1990; Stalk et al., 1992).

Knowledge management concepts have penetrated into many different business functions and processes (Grover and Davenport, 2001). As a disciplined approach, these concepts focus on the various management processes that facilitate finding, identifying, capturing, creating, storing, sustaining, applying, sharing, and renewing knowledge to improve an organization's performance (Gupta and Sharma, 2004; Husain and Nazim, 2013; Nonaka and von Krogh, 2009; Sanchez, 1996).

Knowledge management practices are becoming increasingly imperative for various reasons (Quast, 2013). The three foremost motives are to 1) improve decision-making capabilities, 2) develop learning organizations, and 3) stimulate cultural change and innovation (ibid.). With an increasing awareness and importance of the "knowledge" residing in organizations, there has been a rise in the awareness of the concept, methods, and tools to retain and grow this knowledge (Ahmad and Khan, 2008).

However, existing practices of knowledge management are largely derived by international organizations and private commercial companies. Limited evidence is found on the use of knowledge management at organizational levels and more specifically from developing countries. In light of the potential value of knowledge management practices, such qualitative views and case studies should act as a significant perspective for benchmarking and reflection.

¹ The resource-based view (RBV) sees knowledge as a generic resource that, to some extent, can provide a competitive advantage if, together with other resources, it is expressed in skills and utilized strategically (Barney 1991; Penrose 1959; Grant 1991; Penrose, 1980; Wernerfelt, 1984; Barney, 1991; Grant, 1991; Peteraf, 1993; Makhija, 2003). The resource-based perspective has an intra-organizational focus and argues that performance is a result of firm-specific resources and capabilities (Barney, 1991; Wernerfelt, 1984).

² Knowledge-based (KBV) is viewed as an extension of the RBV of the firm (Grant, 1996; Roos, 1998; Hoskisson et al., 1999; Sveiby, 2001b; Bontis, 2002; De Carolis, 2002; Huizing and Bouman, 2002; Balogun and Jenkins, 2003). KBV considers organizations as heterogeneous entities loaded with knowledge (Hoskisson et al., 1999) that can create productive arrangements that the market, by itself, cannot produce (Demsetz, 1997). According to the KBV, competitive success is governed by the capability of organizations to develop new knowledge-based assets that create core competencies (Pemberton and Stonehouse, 2000).

The purpose of this article is to address this gap. The article provides a pragmatic example of how knowledge management was implemented at one of the most successful organizations in the United Arab Emirates: The Emirates Identity Authority. This article illustrates the implementation approach and framework and how it was linked to achieving organizational objectives and strategic targets. It also outlines some lessons learned that were aggregated during the implementation of knowledge management initiatives. Taking into consideration the fact that governments all over the world have been facing tremendous challenges in the implementation of similar large-scale programs (Al-Khoury, 2011; 2012b), this study also stands as a good example to build upon and benefit from. The case study can also act as a framework with which to develop specific organizational initiatives.

This article is structured as follows. In Section 2, we present the research strategy and the underlying philosophical assumptions as well as the applied research methods. In Sections 3 and 4, we define knowledge and knowledge management and highlight some conceptual underpinnings. In Section 5, we provide an overview of how knowledge management is practiced in the literature review findings and the factors contributing to the development of the field as well as those factors challenging organizations to make the best of such initiatives. In Section 6, the case study is presented and a detailed overview is provided on the followed knowledge management approach. In Section 7, a reflection is made with some key learned lessons. Finally, in Section 8, the article is concluded.

Research Methodology

“Translational research relegates basic science to a back burner...individual curiosity-driven science has been replaced by large consortia dedicated to the proposition that gathering vast amounts of correlative data will somehow provide an answer to life’s fundamental questions.” —Nobel Laureates Joseph Goldstein and Michael Brown

The purpose of this study was to (1) explore the literature to understand the critical role of knowledge management and (2) describe how knowledge management is implemented in government organizations. The research approach followed in this article is a case study. The case study research design has evolved as an ideal tool when a holistic, in-depth

investigation is needed for investigating trends and specific situations (Feagin et al., 1991).

Case studies are tailor-made for exploring new processes or behaviors or ones that are not well understood (Hartley 1994). Moreover, researchers have argued that certain kinds of information can be difficult, or even impossible, to tackle by means other than qualitative approaches, such as case study-based strategies (Sykes, 1990).

The contextual nature of the case study is illustrated in Yin's (1993:59) definition as an empirical inquiry that "investigates a contemporary phenomenon within its real-life context and addresses a situation in which the boundaries between phenomenon and context are not clearly evident."

The case study strategy has been argued to be particularly useful for practice-based problems where the experience of the actors is important and the context of action is critical (Lee, 1989; Galliers, 1991). In addition, the case study approach allows for "thick descriptions" of the phenomena under study (Yin, 1994). Such 'thick descriptions' give the research access to the subtleties of changing and multiple interpretations (Walsham, 1995) that would have been lost in quantitative or experimental strategies (Yin, 1994). The case study approach has also been suggested for projects of a procedural nature extending over a long period of time (Benbast et al., 1987; Yin, 1994; Walsham, 1993; Mitev, 2000b).

As stated, the purpose of this article is to create a better understanding of how knowledge management is being pursued in government organizations. This entailed conducting a detailed study of the context and the processes of implementation and the changes resulting from the implementation process. Such a focus led to the adoption of an interpretive stance that seeks to uncover truth by understanding the phenomena in the real-life context (Walsham, 1995). The selected organization was one of the most successful government organizations in the United Arab Emirates: The Emirates Identity Authority.

Single case studies have been under criticism based on the fact there is little basis for scientific generalization. However, there are several rationales for single case research. The first rationale for is that it represents the critical case in testing a well-formulated theory, and the second may be that a single case may represent an extreme or unique case worth documenting and analyzing. The third rationale is the revelatory case that

exists when a phenomenon not previously accessible to scientific investigation is revealed. We mainly subscribe to the second rationale.

The selection of the organization was based on two issues: accessibility and its renowned international reputation for success. The research design for this study is a descriptive and interpretive case study that is analyzed through qualitative methods. Data collection involved secondary and primary sources. Primary data sources included observation and group discussions that provided face-to-face contact with the social actors in order to explore and probe the responses. Secondary data sources mainly covered publications and technical documentation analysis. The literature review provided an essential content preparation for this research article that helped to provide an overview of the research field and practices and enabled cross-checks between the case studies and literature findings.

Knowledge: What Does It Really Mean?

Knowledge is the only treasure you can give entirely without running short of it. African proverb

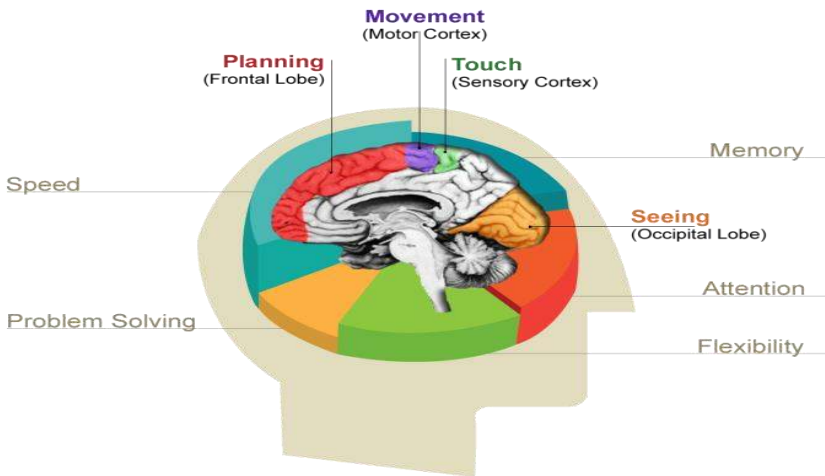


Figure 2: Human brain as a source of knowledge

The first thing that comes across when we refer to knowledge is the wondrous and wonderful information store that we all have in our brains. This is the benchmark, the root, and cause of knowledge. Our brain

processes so much data and information to construct meaning by building relations that make sense of experience (Wittrock, 1992). Such meaning is then used to support our plans of action and response to perceived realities. This, in essence, is what constitutes knowledge.

From an individual perspective, human knowledge is not stored in one single brain area (Supp et al., 2007). Access to knowledge results from the cooperation of several brain areas that jointly build a dynamic brain network (ibid). In an organizational context, knowledge is the product of a similar jointly built network. Knowledge comes from an understanding of the interrelationships between processes that need to be constantly maintained and those relationships are examined and changed as needed (Jones, 2011). It also means that learning processes include anticipating and attending to feedback, creating knowledge from that feedback, and taking action based on that knowledge (ibid.).

There have been many perspectives in which knowledge has been defined in existing literature. Ayer (1956) defines knowledge as a “justified true belief.” O’Dell and Grayson (1998) define knowledge as “information in action.” Davenport and Prusak (1998) define knowledge as “a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experience and information.” They indicated that “it originates and is applied in the minds of knowers.” But “in organizations it often becomes embedded not only in documents or repositories but also in organizational processes, practices and norms” (ibid.).

Let us make this simpler. Knowledge is all about what we know. We know from our interactions, readings, and so on. When we process this and give it a meaning, it becomes information. When information is put into context, it becomes knowledge. This knowledge would normally act a source for further data. Knowledge is therefore seen as a cyclical process as depicted in Figure 3.

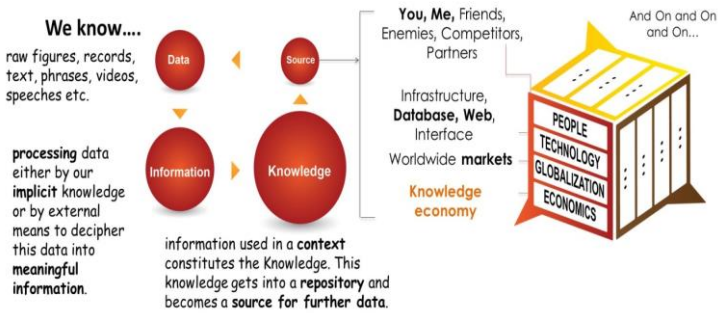


Figure 3: Constituents of knowledge

Experts have sought many to classify knowledge. Figure 4 depicts two of the schema in which knowledge has been sought to be defined. In the first classification, and according to the theory of knowledge, knowledge can be categorized in three ways³: personal, procedural, and propositional (Higgs and Titchen, 1995; Jensen et al., 2007; Russell, 1926). The second classification is based on a philosophical view⁴ that differentiates knowledge as logical, semantic, empirical, and systemic. Essentially what this all means is that knowledge is something we know either inherently or acquired through learning or reasoning.

³ PERSONAL knowledge also referred to as knowledge by acquaintance. This is the kind of knowledge that we are claiming to have when we say things like “I know Mozart’s music.” PROCEDURAL Knowledge: or knowledge of how to do something. People who claim to know how to juggle, or how to drive, are not simply claiming that they understand the theory involved in those activities. Rather, they are claiming that actually possess the skills involved, that they are able to do these things. PROPOSITIONAL Knowledge: the kind that philosophers care about most, is knowledge of facts. When we say things like “I know that the internal angles of a triangle add up to 180 degrees” or “I know that it was you that ate my sandwich”, we are claiming to have propositional knowledge. (<http://www.theoryofknowledge.info>)

⁴ LOGICAL: is the result of the understanding of the relationship of ideas to one another. There are the rules or laws of logic that permit claims to knowledge that are further statements of ideas consistent with the rules and the ideas already accepted. SEMANTIC: is the result of learning the meaning of words. Knowledge of words is knowledge of definitions. Such definitions are set in dictionaries. So bachelors are unmarried males. You know this. People acknowledge this. You can look it up. SYSTEMIC: knowledge of Mathematics and Geometry, which is the result of learning a system of words, or symbols and how they relate to one another and the rules of operating in that system and then any claims made that are consistent with those definitions and rules is called knowledge. EMPIRICAL: comes through our senses. This knowledge is empirical knowledge. Science is the best example of a method for ascertaining the accuracy of such knowledge. Scientific knowledge is a result of the practice of the method: observation, abduction of a hypothesis, careful observation, refinement of hypothesis, deduction of test for hypothesis, testing and experimentation, confirmation or falsification of the hypothesis. (<http://www.theoryofknowledge.info/>)

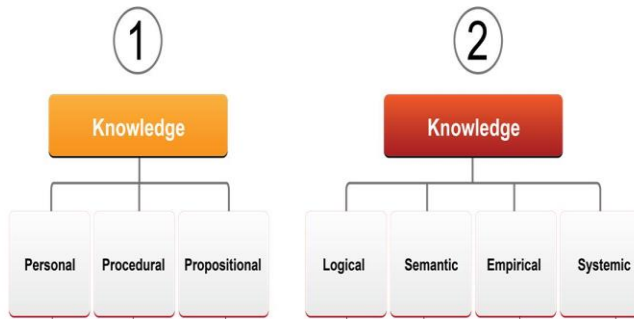


Figure 4: Types of knowledge

In principle, all types of knowledge are viewed as grouped into two primary categories: implicit (tacit)⁵ and explicit⁶ (Gamble and Blackwell, 2001; Koulopoulos and Frappaolo, 1999; Nonaka, 1991; Polanyi, 1966; Tiwana, 2000). See also Figure 5. Explicit means clearly expressed or readily observable, whereas implicit means implied or expressed indirectly. In other words, explicit knowledge is the one that comes from structured data and sources.



Figure 5: The iceberg metaphor describing the relationship between explicit and implicit knowledge

⁵ Tacit Knowledge: Deeply personal experience, aptitudes, perceptions, insights, and know-how that are implied or indicated but not actually expressed—it resides in individuals & teams.

⁶ Explicit Knowledge: Knowledge that is codified and conveyed to others through dialog, demonstration, or media such as books, drawings, and documents.

Implicit knowledge is either inherent knowledge or acquired by reasoning or learning. The complexity of knowledge management is compounded because optimal mechanisms for acquiring knowledge are related to these two types (Chang-Albitres and Krugler, 2005).

Let us elaborate. Figure 6 depicts these two knowledge types in two layers: one at the individual level and another at the organization level. At best, part of the tacit knowledge could be captured and put into a paper format from writings or electronic documents. By contrast, the organization layer of implicit knowledge lies in unstructured, undocumented operations or processes. Procedures that are understood to be followed without documentation constitute implicit organizational knowledge. Thus, the management of implicit knowledge to move to the explicit knowledge is what constitutes knowledge management. The key here is how we capture implicit knowledge and convert it to make it explicit and use it to guide our decisions and improve performance.

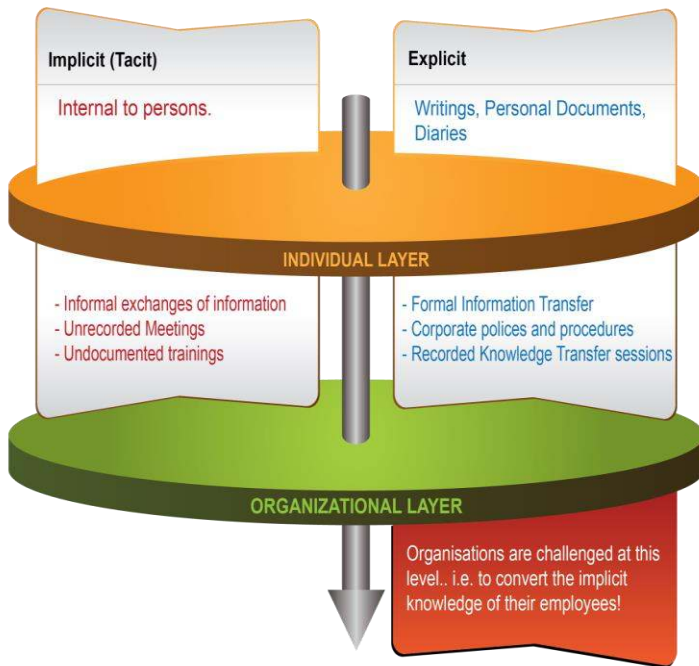


Figure 6: Layers of knowledge

In general, organizations are realizing that intellectual capital⁷, which is widely referred to as corporate knowledge, is a valuable asset that can be managed as effectively as physical assets in order to improve performance (Sharma, 2014). In fact, in the new knowledge economy, the possession of relevant and strategic knowledge and its unceasing renewal enables businesses to gain a competitive advantage (Lee, 2005). This is based on the recognition that knowledge is a key factor of economic development in modern societies as well as human and sustainable development (D'Antoni, 2007; Mansell and Tremblay, 2013).

In 1965, Peter Drucker pointed out that “knowledge” would replace land, labor, capital, machines, and other fixed assets of organizations to become the chief source of production (Drucker, 1965). Indeed, the role of knowledge today has become more vital as the key to the development of a knowledge-based economy and knowledge societies (Asogwa, 2012).

Managing knowledge today is becoming a business imperative for those organizations that want to protect their present, build future opportunities, and stay ahead of the competition (Hadagali et al., 2012). This is elaborated on in the following section as we attempt to define knowledge management.

Knowledge Management: A Growing Science

“In Africa, when an old man dies, it is a library that burns down.” Amadou Hampâté Bâ

Knowledge management in existing literature is defined in a variety of ways. Gartner defines knowledge management as “a discipline that promotes an integrated approach to identifying, managing and sharing all of an enterprise’s information needs. These information assets may include databases, documents, policies and procedures as well as previously unarticulated expertise and experience resident in individual workers.”

Knowledge management is also viewed as a strategy to enable people to develop a set of practices to create, capture, share, and use knowledge to advance (Dalkir, 2011; Drucker, 1998; Garvin, 1998; Hislop,

⁷ Intellectual Capital: Intangibles such as information, knowledge, and skills that can be leveraged by an organization to produce an asset of equal or greater importance than land, labor and capital.

2013; Jennex and Smolnik, 2010; Nonaka, 1998; O'Dell and Hubert, 2011; Pasher and Ronen, 2011; Russ, 2009; Tiwana, 2002).

Let us make this simpler again. As a practitioner, we define knowledge management as a framework of information sharing and dissemination that helps organizations make better decisions, enabling organizational creativity and innovation.

By and large, knowledge management in the corporate world is seen as a moronic activity with buzzwords like optimization, initiative management, key learnings, etc. But is that what knowledge management is all about? In principle, knowledge management focuses on four main components of people, process, technology, and knowledge, as illustrated in Figure 7. This represents the four steps of knowledge management: create/generate, represent/store, access/use/re-use, and disseminate/transfer. A knowledge management initiative to be successful requires consideration and interactions among all of these components (Wickramasinghe, 2006).

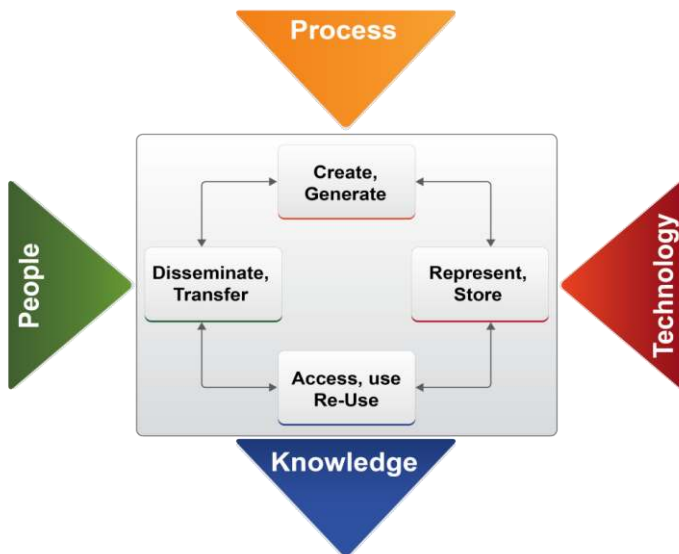


Figure 7: Knowledge management components
Source: Wickramasinghe (2006)

Elaborating further on what was outlined in Section 3 about implicit and explicit knowledge, we must understand that what categorically distinguishes a competitive organization from another is not its explicit knowledge, but rather resides in how effectively it uses its tacit knowledge i.e., the power of its people (Chang-Albitres and Krugler, 2005). Among the core objectives of knowledge management is then to expand the understanding and application of tacit knowledge throughout an organization. See Figure 8.

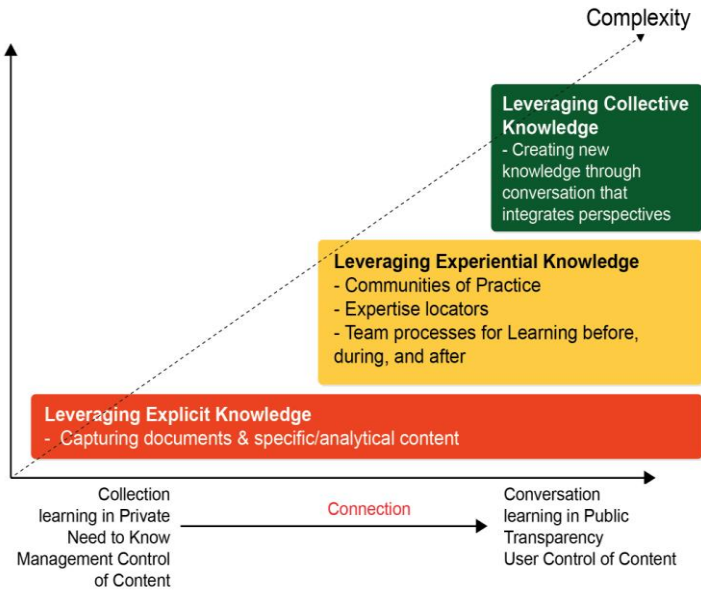


Figure 8: Knowledge management development

Conversely, as shown in Figure 9, tacit knowledge cannot be fully transformed into the explicit form (Mertins et al., 2003). Furthermore, explicit knowledge can only rarely be fully personalized or internalized by an individual. Transfer and personalization of knowledge is the goal of knowledge management, as personalization allows a more thorough transfer of both types of knowledge (Mertins et al., 2003).

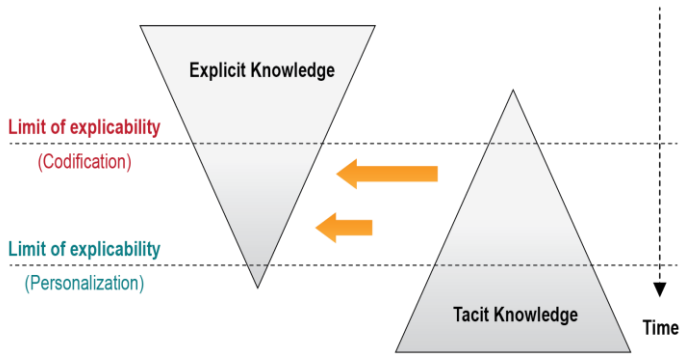


Figure 9: Limits of knowledge explicability
Source: Mertins et al. (2003)

A balance between human-oriented knowledge management and technology-oriented knowledge management is critical for the successful implementation of a knowledge management system (Maier, 2002). To achieve this balance, there is a need to develop a strategy to integrate organizational knowledge into knowledge management tools (ibid.). The relationship between these forms of knowledge management is shown in Figure 10.



Figure 10: Human-oriented versus technology-oriented knowledge management and approaches to integration
Source: Maier (2002)

Successful knowledge strategies depend on whether organizations can link their business strategy to their knowledge requirements (Constantinescu, 2013). This articulation is vital to allocating resources and capabilities for explicating and leveraging knowledge (ibid.). The competitive value of knowledge must be addressed to assess areas of weaknesses. Strategic efforts should be made to close these knowledge gaps to ensure the organization remains competitive. The strategic value of knowledge should be addressed, focusing on the uniqueness and use case of knowledge (ibid.).

So, the thrust of knowledge management is to create a process of valuing the organization’s intangible assets in order to best leverage knowledge internally and externally (Liebowitz, 2000). The idea here is to create a knowledge sharing environment.

Indeed, knowledge management is a practice that needs to be implemented consciously to harness the true benefits of knowledge and its utilization in the organization. The next section provides an overview of how knowledge management is practiced and the factors contributing to the development of the knowledge management field as well as those factors challenging such initiatives.

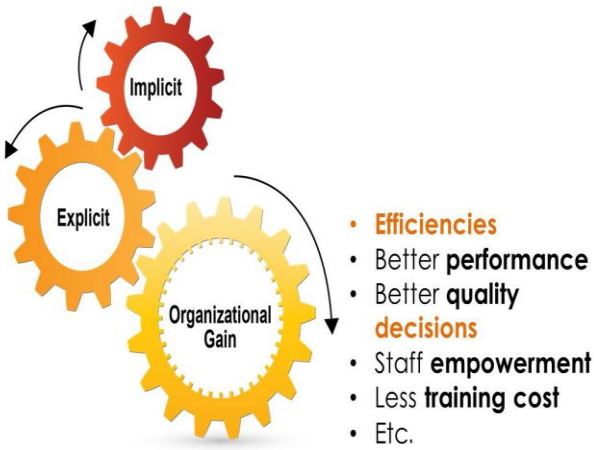


Figure 11: Knowledge transformation

Knowledge Management in Practice

“Knowledge management is not a shrink-wrapped thing in a box, it’s a discipline.” Scott Elliot, Lotus Knowledge Management

Dimensions and Tools

Based on the analysis of some 100 knowledge management initiatives, Skyrme (2002) lists seven recurring levers of common knowledge management practices adopted by the surveyed organizations. These were aimed at strengthening organizational knowledge-building efforts and improving the performance across the organization. Table 1 depicts these seven knowledge levers.

Table 1: Seven Knowledge Levers

Focus area	Description
Customer knowledge	Developing deep knowledge sharing relationships. Understanding the needs of customers. Articulating unmet needs. Identifying new opportunities.
Knowledge-enhanced products/services	Knowledge embedded in products. Surround products with knowledge, e.g., in user guides, and enhanced knowledge-intensive services.
Knowledge in people	Knowledge sharing fairs. Innovation workshops. Expert and learning networks. Communities of knowledge practice. People-focused programs aim to continually improve workforce skills through development.
Organizational memory	Knowing what an organization knows, over space and time, e.g., sharing best practices or recording lessons learned. Directories of expertise. Online documents, procedures, and discussion forums. Intranets.
Knowledge in processes	Embedding knowledge into business processes and management decision making.
Knowledge in relationships (Stakeholders)	Improving knowledge flows between suppliers, employees, shareholders, and community, etc., by using this knowledge to inform key strategies.
Knowledge assets (Business Environment Insights)	Systematic environmental scanning, including political, economic, technology, social, and environmental trends. Competitor analysis. Market intelligence systems.

Source: Skyrme (2002)

Views captured in the existing literature indicate that knowledge management can only be a powerful tool if successfully implemented (Ackoff, 1999; Ahn and Chang, 2004; Anantatmula and Kanungo, 2007; Bali

et al., 2009; Benassi et al., 2002). A study published by the United Nations in 2007 that examined how organizations implemented knowledge management systems found that surveyed organizations have adopted diverse knowledge management solutions to structure, generate, and disseminate knowledge. These are depicted in Figure 12.

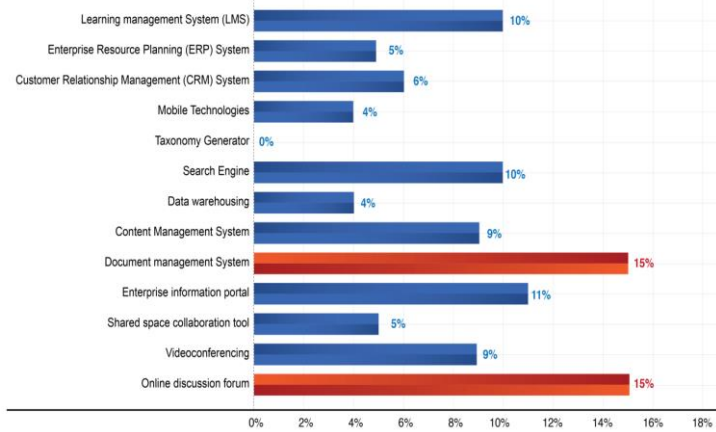


Figure 12: The diverse knowledge management solutions
Source: Yuen (2007)

The above results are validated by a recent study published by the International Competitiveness Network (ICN) publication in 2013 (ICN, 2013). The primary findings are depicted in Figure 13.

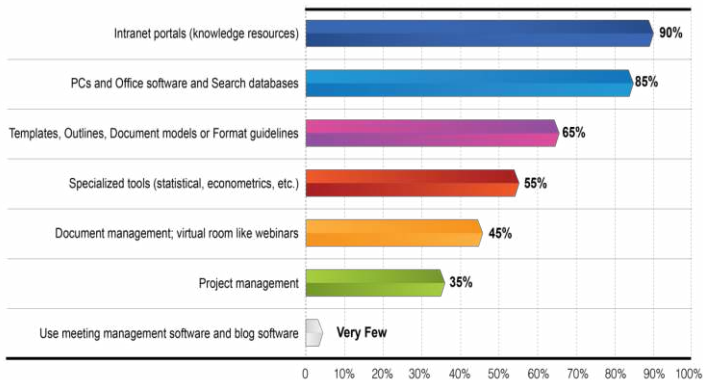


Figure 13: ICN study on knowledge and information sources

Source: ICN (2013)

The ICN report also indicated numerous methods followed by the surveyed organizations for knowledge capture and conversion. This is depicted in Table 2.

Table 2: Methods used by organizations to capture internal knowledge

Methods for capturing explicit and tacit knowledge	Type of Knowledge	% of organizations
Close-out reports, final research reports, internal seminars	Explicit	80%
Capturing achieved as a by-product of our work	Explicit	70%
Staff document experiences and make them accessible	Explicit/Tacit	65%
Communities of practice/expertise groups	Tacit	50%
Best practices database/lessons learned databases	Explicit/Tacit	50%
Staff expertise database	Tacit	20%
Knowledge development teams	Tacit	5%

Source: ICN (2013)

Strategy and Measurement

Despite such positive outlooks, the field study established that more than half of these organizations do not have a defined knowledge management strategy and that less than 12% of these organizations had their knowledge management strategies linked to an overall corporate strategy (Turner and Minonne, 2010). This finding is also confirmed by many other studies (see, for example, ICN, 2013; Akhavan et al., 2005; Benassi et al., 2002; Garcia-Perez and Ayres, 2009; Pettersson, 2009; Weber, 2007).

In a more recent study, an ICN survey confirmed the above findings and indicated that 56% of the organizations did not have a transparent knowledge management strategy within their organizations, and for the few that did, they tended to have a set of processes and an electronic systems rather than a defined strategy.

The interesting fact is that, in most of the above surveys, half of the organizations actively engaged in knowledge management practices admitted to being unable to judge their performance because they have had few or no measurement tools and lacked the appropriate skills to develop them (ICN, 2013; Turner and Minonne, 2010).

Talking about measurement, a study by APQC found that many organizations simply look at things like overall growth, profit, and new product sales to evaluate whether or not knowledge management has made an impact (APQC, 2003). While these are certainly important, they are highly unlikely to be influenced solely by knowledge management activities and therefore make poor metrics (ibid.). A further problem found by the same study was that such outcome measures are all lagging indicators and it might take several years for the sharing of knowledge to impact them.

Strategists also warned organizations to avoid falling into the trap of measuring knowledge management by counting teams, meetings, databases, website hits, or similar meaningless things that are easy to quantify and report (Chatzkel, 1998; Chen et al., 2009; Huang et al., 2007; Lee et al., 2005; Mitchell and Boyle, 2010; Mohamed et al., 2013; Skyrme, 2003; Sveiby, 1997; Wen, 2009). But they need to focus most of their metrics on real results that can be attributed to knowledge management (ibid.).

The literature of knowledge management is of the belief that measurement is fundamental and must be clearly articulated to drive continuous performance improvement, be it related to resource use, environmental impact, or financial performance (Knoco, 2008). This implies the measurement must be closely linked with performance management and, in particular, with metrics and benchmarking and with target setting (ibid.). These three components should then constitute a management framework for enabling continuous improvement through knowledge management, as depicted in Figure 14.

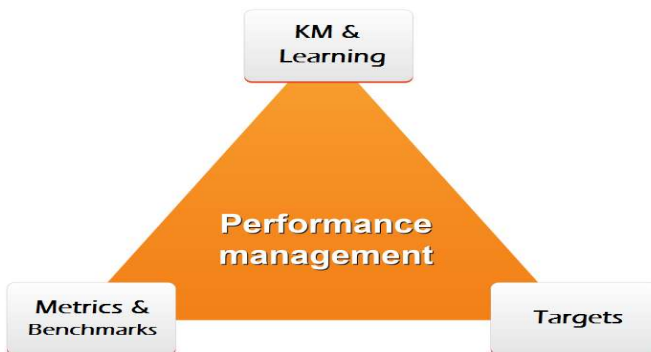


Figure 14: Continues improvement of knowledge management
Source: Knoco (2008)

Benchmarking indeed is seen as an important activity to determine the effectiveness of the followed approach and to learn from other leading practitioners (Nonaka and Takeuchi, 1995; Hedlund, 1994). However, it is interestingly noted in the existing literature that, although Western business organizations are, to a great extent, actively involved in benchmarkings, it has been of lesser significance in organizations in developing countries (Al-Athari and Zairi, 2001; APQC, 1996; O'Dell et al., 1999).

One explanation for this could be that knowledge management has been a recognized domain of practice in developed countries for more than a decade (Okunoye et al., 2002). In developing countries, it was not until knowledge management matured and became seen as almost essential for the continued existence and survival of organizations before any attention was being paid to it (Okunoye et al., 2002).

Barchan (1997) has cautioned that even though measurement is essential in knowledge management, it is better not to just jump on the bandwagon without giving proper thought to what appropriate measures will be used. He stressed that it is pertinent to create an internal understanding of what the intangible assets are and what they mean to the overall performance of an organization (Barchan, 1998, 1999, 2000). It is widely recognized in the existing literature that the lack of effective knowledge management measurement constructs is a key reason for the lack of empiricism in the field (Ahmed et al., 1999; Bontis, 2001; Darroch, 2003; Housel and Bell, 2001; Dzinkowski, 2000; Lev, 2001; Sveiby, 2002; Turner and Minonne, 2010; Wang and Ahmed, 2004).

Again, and despite all of this, organizations by and large have been facing difficulties in measuring the benefits of their knowledge management practices at least in quantifiable terms. Knowledge management in numerous surveyed organizations was seen as a supportive activity to other organizational initiatives (EIU, 2009; Grover and Davenport, 2001; O'Riordan, 2005).

Alber (2004) argues that rather than using abstract return on investment (ROI) calculations that are too easily manipulated by project proponents, it is preferable to use measures that closely track a firm's business and the interests of clients. Leverage, effective rate, and profit components are such measures.

Such views opened the room for more subjective interpretations of the term value. With such perspectives, knowledge management in the

existing literature is reported to lead to delivering a wide range of benefits, e.g., better customer experience, followed by notably better performance, enhancing new staff's capabilities, and better quality decisions (ICN, 2013). Other benefits reported included enhanced institutional memory, improved internal communication, and more successful transfer of knowledge. The top benefits are depicted in Table 3 with weighting accorded to each.

Table 3: Reported impact of KM practices

Benefit Areas	% of Organizations reporting a particular benefit
Efficiencies (not duplicating work)	25%
Better Performance	20%
Better Quality Decisions	17%
New People becoming Self-Sufficient More Quickly	18%
Staff Empowerment	7%
Faster Case Life Cycle	8%
Less Training Cost per Employee	3%

Source: ICN (2013)

Other studies indicated large revenue gains and efficiency improvements from knowledge management in numerous major organizations. A few examples are depicted in Table 4.

Table 4: Knowledge Management Value

Organization	Knowledge Management Benefits
Ford Motor	Accelerated the concept-to-production time from 36 months to 24 months. The flow on value of this has been estimated at US\$1.25 billion (Stewart, 2000).
Dow Chemical	Saved \$40 million a year in the re-use of patents (Skyrme, 2002a).
Chase Manhattan	One of the largest banks in the U.S. used customer relationship management knowledge management initiatives to increase its annual revenue by 15% (Rollo, 2002).
Glaxo Wellcome	Focusing on shareholder value and a better understanding of the value of its R&D pipeline has significantly increased its share price over the last few years (Skyrme, 2000).
Texas Instruments	Saved the \$500 million cost of new plant by leveraging internal knowledge and best practices (O'Dell and Grayson, 2000a).
Chevron	Saved millions through sharing practices across its refineries and other business units (O'Dell and Grayson, 2000b)
Silicon Graphics	Reduced sales training costs from \$3 million to \$200,000 by managing its product information communications process

	(Manasco, 1997).
Kaiser Permanent	One of its branches (the Northwest Region) was able to implement an open access program six to 12 months faster than predicted by transferring in a best practice from another region (APQC, 1996).

Intellectual Assets/Capital

As indicated, in the real world of practice, knowledge management value is very much perceptible and differs from one organization and industry to another. Indeed, no ROI value measurement is one-size-fits-all (Nadeem, 2005). Therefore, value is computed using various parameters other than what we outlined above. One of the increasingly popular parameters being measured is intellectual assets/capital (Kidwell et al., 2000; Saint-Onge, 1996; Hubert, 1996; Lynn, 1998; Manasco, 1997a; Skyrme, 2002c; Ulrich, 2000).

Gartner researchers believed in 2003 that intellectual capital would be the primary way that businesses measured their value (Seubert et al., 2001). The present market economy is orientated mainly to the expressing of direct financial revenues, but there is growing force for expressing not tangible capital since it is part of the market value of the subject (Antosova and Csikosova, 2011).

This reminds us of the remarkable case in 1995 when IBM bought Lotus for US\$3.5 billion—14 times its book value (Rylatt, 2003). This signaled that marketplaces put immense importance on the value of intangible assets, such as intellectual property and know-how, to speculate on the likely success of a business (ibid).

There are various approaches to the measurement of intellectual capital. Some of the known monetary values arising from knowledge management are presented in Figure 15. These are as reported in Deutsche Bank’s Research Report on Knowledge Assets published in 2013.

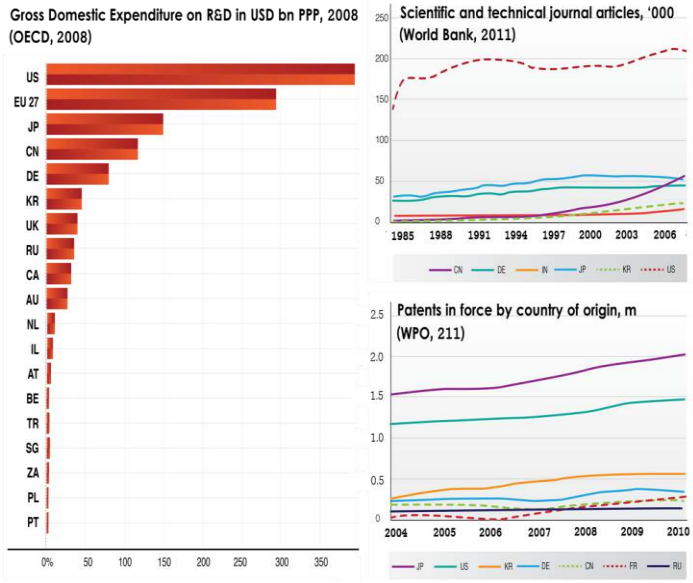


Figure 15: Value of knowledge management
Sources: World Bank (2011), WIPO (2011), and OECD (2008)

Critical Success Factors

On a different angle, knowledge management initiatives similar to other practice fields have been facing other challenges. Some early figures pointed that up to 84% of all knowledge management programs fail (Lucier and Torsiliera, 1997).

Yuen (2007) indicates that some of the primary reasons for knowledge management failure are due to two main reasons:

- 1) Ownership of the knowledge management initiative and its implementations is largely passed to IT departments.
- 2) Lack of awareness and lack of time allocated to knowledge management practices that can be interpreted as a lack of awareness of knowledge management’s importance.

Frost (2014) discovered several reasons by analyzing the root causes of failed initiatives across various organizations where knowledge management was being implemented. His analysis is very thought-

provoking and provides pointers to what organizations should be doing for harnessing the true benefits of knowledge management (Table 5).

Table 5: Root causes for knowledge management failure

Causal Failure Factors	Resultant Failure Factors
Lack of performance indicators and measurable benefits	Lack of widespread contribution
Inadequate management support	Lack of relevance, quality, and usability
Improper planning, design, coordination, and evaluation	Overemphasis on formal learning, systematization, and determinant needs
Inadequate skill of knowledge managers and workers	Improper implementation of technology and improper budgeting and excessive costs
Problems with organizational culture	Lack of responsibility and ownership
Improper organizational structure	Loss of knowledge from staff defection and retirement

Source: Based on Frost (2014)

Ndou (2004) indicated that for successful implementation of knowledge management initiatives, it is imperative to take into account the following six elements:

- (1) Role of leaders and strategy definition
- (2) Change management
- (3) Development of human capital and lifelong learning
- (4) Provision of ICT infrastructure
- (5) Partnership and collaboration
- (6) Policies and legislation

According to Trussler (1998), there are some crucial footsteps that need to be considered for the successful implementation of knowledge management initiatives. Figure 16 illustrates some key building blocks that were acknowledged in successful knowledge management programs.

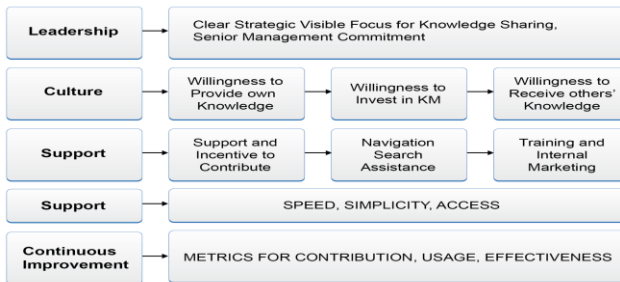


Figure 16: Building blocks for successful knowledge management

Source: Trussler (1998)

Culture was among the most critical issues that have been cited widely as a challenge to knowledge management. Indeed, organizational culture is a critical factor in building and reinforcing knowledge management in organizations (Rai, 2011). Problems besetting knowledge management are seen as problems of structural organization and changes that can be managed by political means (Firestone and McEllroy, 2003). Firestone and McEllroy (2003) found that in successful initiatives, structural changes aligned individual motivational/incentive systems with organizational incentive systems to encourage individuals and teams to collaborate, share knowledge, and leverage the knowledge network (see also Trussler, 1998:18).

Knowledge Management in the Public Sector

Despite such potential, it is widely noted in the current literature that the applications of knowledge management in the provision of public services is not yet widespread (Arora, 2011; Okunoye et al., 2002; Zaharova and Zelmene, 2004). Researchers argue that among the most obvious reasons for such limited application in the public sector are related to the “cultures and contracts which serve to impede rather than support the collaborative and improvement focused culture” (Bureš, 2003; Lekhi, 2007; McDermott and O’Dell, 2001; Milner, 2000).

Supporting such observations, Bate and Robert (2002) refer to a tendency that appears to be an embedded public sector culture of not sharing information and knowledge between departments leading, in turn, to a difficulty in both the creation and maintenance of (a) inter-departmental relationships and (b) the potential to develop “communities of interaction” (see also Erridge and Greer, 2002). Bardzki and Reid (2004) and Bannister (2003) point to the fact that the traditional hierarchical structures in the public sector have been potential causes to hinder the success of knowledge management initiatives as such structures may well support the notion of territory and power.

Nonetheless, global trends point to an opportunity for organizations in public and private sectors to use knowledge management as a key driver towards increasing productivity and building a more user-centric business

models. Opportunities are envisaged to be multifold for governments to enhance processes, improve communication flows, and build an atmosphere of trust, transparency, and openness in decision-making (Al-Bastaki and Shajera, 2014; Bardzki and Reid, 2004; Barquin and Clarke, 2013; Biygautane and Al-Yahya, 2011; Syed-Ikhsan and Rowland, 2004; Young et al., 2013; Yuen, 2007). Riege and Lindsay (2006) list some additional potential benefits of knowledge management that could support the transformation initiatives in public sector:

1. Maximizing efficiencies across all public services by connecting silos of information across different levels of government and across borders
2. Developing new or consolidate outdated systems to improve overall performance and capitalize on a broader, more integrated, and easier accessible knowledge base
3. Improving accountability and mitigating risk by making informed decisions and resolving issues faster, supported by access to integrated, transparent information across all organizational boundaries
4. Delivering better and more cost-effective constituent services such as enhancing partnerships with and responsiveness to the public

Undeniably, effective knowledge management is a catalyst for innovation and the development of new capabilities. Knowledge management for governments as such is no longer a choice but an imperative if their countries' economies have to survive in the unfolding era of privatization, liberalization, and globalization (Misra, 2007).

Developed and emerging market nations like the United States, European Union, India, Japan, and Korea started with specific knowledge development programs and specific working groups designated to enhance the knowledge in the respective countries (EU-UKN, 2013; FKWG, 2012; NKC, 2013; World Bank, 2011). Knowledge in these countries, both at national and organizational levels, plays an increasingly important role in sustainable development.



Figure 17: Increasing global interest in knowledge management

The results that these countries and their organizations have achieved are obvious for us to see. These nations have not become successful by chance. They have consciously and diligently built on their limited resources by garnering all the knowledge and creating conducive environments to enhance their knowledge and build competitive economies. See also Annex-1 and Annex-2 to read more about how Japan and the United States used knowledge management to support societal and economic development.

The review of the literature suggests that knowledge management is indeed a desirable endeavor to foster sustainable development (Sharma et al., 2007). However, it is observed that the key to successful knowledge creation and sharing is complex (ibid.). Therefore, a more complex, holistic, and comprehensive vision and a clearly developmental perspective are needed (UNESCO, 2003). The road, according to many think tanks, still remains to be travelled, but there are positive signs that a culture of sharing will promote a culture of learning that should, in turn, contribute to human and sustainable development (ibid.). By all means, the increasing expectations and demands of citizens for easier and greater access to information will force knowledge management to take its position in the government game.

With this extensive review of existing literature around knowledge management, the first part of this article is completed. In the second part of

this article, a case study of a successful knowledge management implementation is presented. The qualitative nature of the content is perceived to provide a framework with which to develop specific organizational initiatives.

Knowledge Management in Action: The Case of the Emirates Identity Authority

“Too often, people think of knowledge management as a noun. They’re mistaken: KM is a verb, a way of getting work done.” Jeff Angus, KM Magazine

The Emirates Identity Authority (also referred to as Emirates ID) is a federal government organization in the United Arab Emirates (UAE). This authority was established in 2004 to take over the implementation of a national identity management infrastructure from the Ministry of Interior and roll out the project throughout the country. It is responsible for registering all of the country’s population, both citizens and legal residents, and issue smart identity cards to them with digital credentials for use in electronic environments. At present, it has more than 60 service centers across the country with more than 1,400 employees.

This program is part of a global move to revolutionize current identity management systems and support more robust identification and authentication of individuals in physical and virtual environments (Al-Khouri, 2012b). The initiative is viewed as one of the most critical foundation prerequisites for the development of a digital infrastructure that will support the realization of a knowledge economy (Al-Khouri, 2014).

At present, and compared to its international peers, the Emirates ID is considered one of the most successful implementations of identity systems in the world and a benchmark for best practices (INSEAD, 2014). Although it went through some ups and downs in its early stages that obstructed its first strategy cycle to achieve its goals, the transformation initiative taken up by the new management team in the second half of 2009 pushed the organization to accomplish significant results. The Emirates ID was recognized in 2012 as the best government authority in the UAE (Al Makahleh, 2012), as part of a federal excellence scheme that evaluates government organizations based on their performance on EFQM model criteria (SKGEP, 2014).

The ID Authority argues that its use of knowledge management practices and strategies helped to achieve strategic insights and specific experiences that supported overall organizational development and maturity. Figure 18 depicts the knowledge management approach followed at the Emirates Identity Authority. It basically depicts the activities in four main components. The first stage describes what the organization aims to achieve with knowledge management. The second stage represents the players who participated in the journey. The third stage represents how the organization handled the execution part and set the foundational work at the operational level. The why stage represented the actual results that were gained from the knowledge management exercise. The approach was highly iterative and interactive. Each stage is elaborated next.

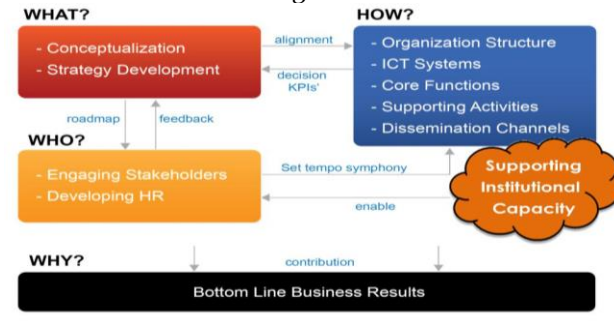


Figure 18: Knowledge management approach at the Emirates ID

Stage 1 (What?): Direction Setting

This stage represented an epistemological starting point at the Emirates ID. The interest of higher management in organizational knowledge prompted to them to think about how to manage knowledge for the organization’s benefit. Thus, knowledge management was addressed from a strategic perspective and within the context of inter-organizational networks to improve organizational performance. This prompted a move from a resource-based view to a knowledge-based view of organizations.

Knowledge management, therefore, was viewed as a strategic resource and capability and was linked to organizational dimensions of improvements of processes and services, business performance, relationships with customers, and organizational and strategic targets and as

a means of superiority, excellence, and competitiveness (Figure 19). The following subsections provide additional descriptions of this stage.

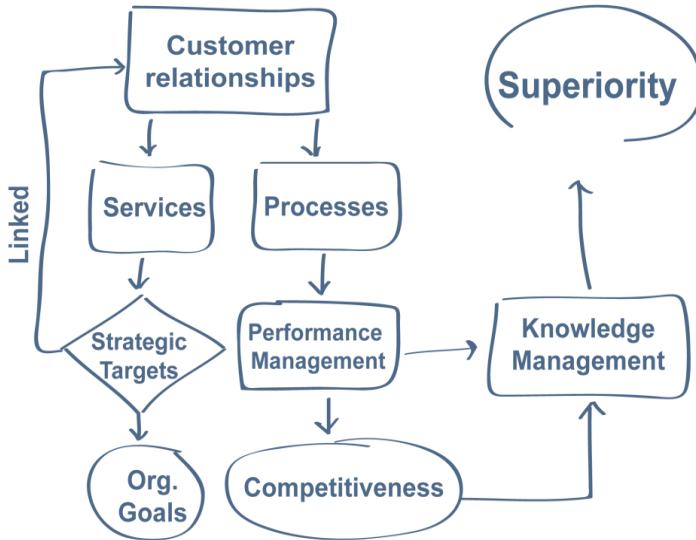


Figure 19: Knowledge management concept at the Emirates ID

6.1.1. EFQM Model

Instead of starting from scratch, the Emirates ID decided to follow the European Framework for Quality Management (EFQM⁸) and use it as guiding principles to develop organizational excellence. The framework supported the organization in consolidating its knowledge base according to the different dimensions of the framework.

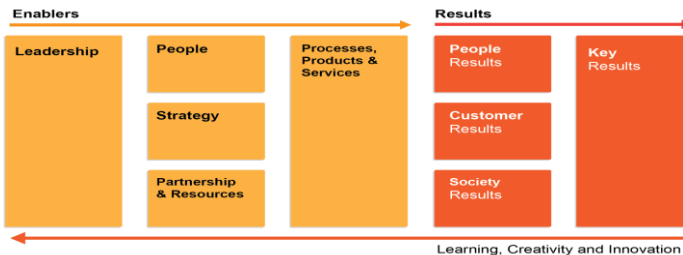


Figure 20: EFQM Model

⁸ The EFQM Excellence Model is a widely used organizational framework in Europe, with about 30,000 organizations using it (EIPM, 2006). In recent years, more countries have started implementing the model, especially across the Middle East and South America.

As depicted in Figure 20, there are nine main criteria in the model that underpin this excellence premise and attempt to cover all organizational activities. These are separated into enablers and results. The enabler criteria are concerned with how the organization conducts itself, how it manages its staff and resources, how it plans its strategy, and how it reviews and monitors key processes: leadership; people, policy, and strategy; partnerships and resources; and processes. The organization's results are what it achieves, and these encompass the level of satisfaction among the employees and customers; its impact on the wider community; and the effects on key performance indicators of people results, customer results, society results, and key performance results.

The Emirates ID sought to build and manage knowledge in each of the nine criteria to achieve the state of excellence in that area. The Authority paid triple-higher attention to three main dimensions in the framework: focusing on results and outcomes rather than outputs, developing human capital, and building an organizational environment to support learning, creativity, and innovation (Al-Khouri, 2012a).

6.1.2. Strategy Development

Emirates ID recognizes that the creation of knowledge is only brought about through the recognition of gaps in an organization's knowledge management practices. This triggered a move to revise its organizational strategy and develop a specific strategy to deal with how the organization will tackle knowledge management and drive innovation. The strategy ensured that knowledge management initiatives were aligned with broader organizational directions, overall strategy, and objectives. This step was also identified by the authority as critical to the success of knowledge management (Oluikpe, 2012). Figure 21 depicts a high level approach followed to develop the strategy.

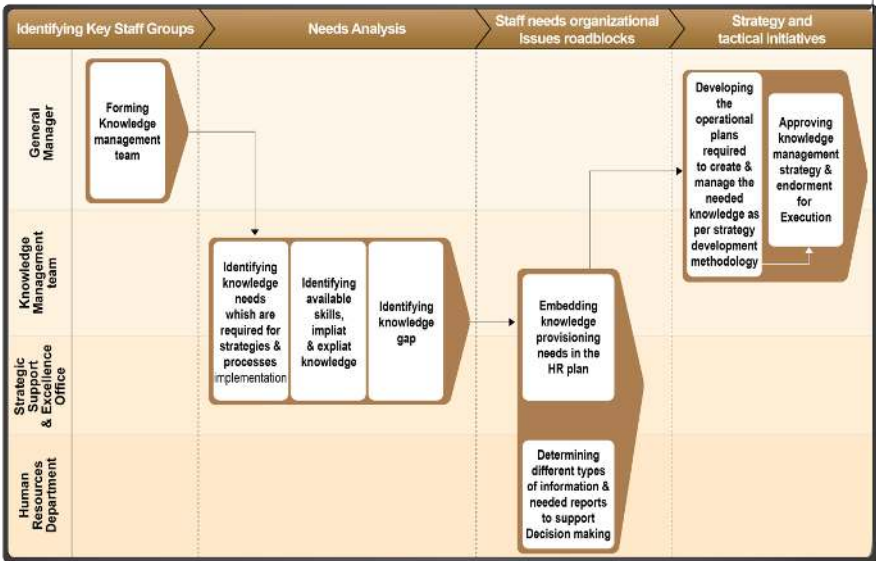


Figure 21: Knowledge management strategy development process

The Emirates ID comprehended that knowledge management is closely related to change management, as the former requires a shift in culture and a fundamental re-organization of the way the organization operates (Klimek et al., 2012; Tobin, 2003). The Emirates ID put in place a high-level changed management plan that showed how to deal and control the organizational productivity during the change stages. See Figure 22.

Different tactics were adopted such as the use of various communication channels, coaching, internal feedback, and reward and recognition schemes that provided powerful incentives for the employees to get involved in the knowledge management activities. These are elaborated in the second and third stages of the approach.

Having agreed on the change management plan, the Emirates ID then moved on to the second stage in its knowledge management approach that dealt with the players in the game: employees, partners, and customers.

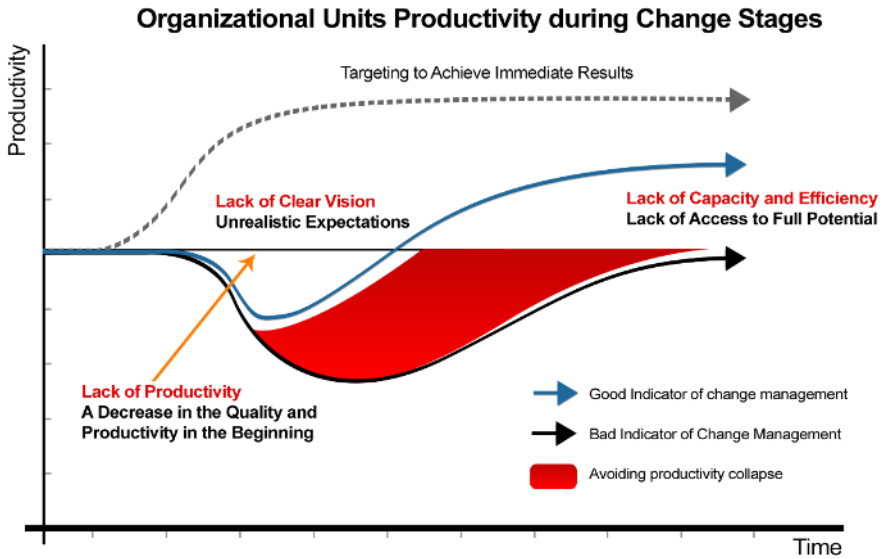


Figure 22: Change management productivity Stage 2 (Who?): Involving the Players

6.2.1. Engaging Stakeholders

The Emirates ID took on many initiatives to engage all key players in its knowledge management journey: employees, partners, customers, Board of Trustees, etc. It organized many workshops and brainstorming sessions to get feedback on how well the organization was doing (also provided feedback for the strategy development phase described in 6.1.2).

Although this was an ongoing activity, it was a starting point for the Emirates ID to assess how knowledge management would affect its abilities to meet its goals; the effectiveness of individuals and teams; and to what extent the organization’s culture, processes, and systems acted as enablers of, or barriers to, good knowledge of management practice (Hulsebosch et al., 2009).

Assessment feedback was grouped according to the nine criteria of the EFQM model. This involved asking for each of the criteria, “How good is the authority and how could it improve?” The two main methods used to capture feedback were questionnaires and workshops. This produced detailed documents describing what it is doing under each of the EFQM

criteria and sub-criteria. This was used as an input to the strategy development phase (described in Section 6.1.2).

6.2.2. Human Capital Development

The foundation, or fundamental cause for strategic success, has to do with people. Decades ago, Peter Drucker recognized that innovation from creative people provides the only assured source of long-term success and competitiveness because every other aspect of an organization can be duplicated by others (1994). The right people must be hired, properly trained, and mentored, and the learning process must become continuous and endless. Peter Senge, in his very influential book, *The Art and Practice of the Learning Organization*, described a healthy organization as one in which a learning culture prevails, fostered both by formal and informal learning and by abundant internal communication via all media (Senge, 1990).

The Emirates ID paid particular attention to developing human capital by supporting employees' skills development. Human resource strategies put in place enabled the Emirates ID to implement various policies for the management of its human resources. This strategy dealt with how the organization selects, recruits, trains, and nurtures its workforce for effective performance and delivery of services. Human resource strategies were largely based on the Investors in People standard⁹.

The Emirates ID also signed several joint cooperation agreements with many universities and training institutions to support its employees' learning. It also offered funding opportunities to those who met set targets of personal development plans. Annual appraisals, promotions, and awards for best performance were based on the fulfillment of individual performance contracts.

This attention reflected positively on the moral, motivation, and retention rates. It also had a positive impact on the efficiency of service delivery and customer care processes, as well as the development of core competencies and capabilities. The application of these different human resource management strategies and standards in the organization has

⁹ Investors in People is a business improvement tool launched in 1991, and administered by UK Commission for employment and skills and supported by the Department for Business, Innovation and Skills.

enabled it to receive numerous national and international recognition and awards in recent years.

As an integral part of its knowledge management strategy, the Emirates IDs revised its human resource management strategies annually to ensure that they enabled the organization and its service centers to manage their managerial activities by coordinating employee-related processes.

Believing that the success of any organization is very much determined by the kind of human resource management strategies it employs (Wolpert, 2001), the Emirates ID had to reshuffle its management teams at different times by rotating them to different jobs and following a lay-off approach to get through some management bottlenecks. Management teams were viewed as key players who should have the skills and charisma to persuade and inspire others towards attaining the objectives and goals of the organization. Management teams at the Emirates ID and across service centers were expected to be the motivators to their co-fellows and employees and offer directions personally and within teams to various departments and divisions. In basic terms, human resource management strategies and tactics played key roles and contributed immensely to redefining knowledge management in the Emirates ID.

This third stage (How?) represented how the knowledge management strategy was executed. This is elaborated in the next section.

Stage 3 (How?): Setting the Tempo Symphony at the Organizational Level

6.3.1. Organizational Re-Structure

Recognizing that successful knowledge management depended upon structures and cultures, the Emirates ID embarked on several organizational re-structuring initiatives and paid particular attention to the element of knowledge ownership. The different organizational structures adopted were designed to ensure the provision of an environment for organizational learning.

The structure was changed three times in five years to align it with the operating model. Organizational restructuring exercises had the fundamental goal of ensuring and facilitating clear, open communication

that enables organizational learning and clarifies accountability for results. Figure 23 depicts the structure in place today.

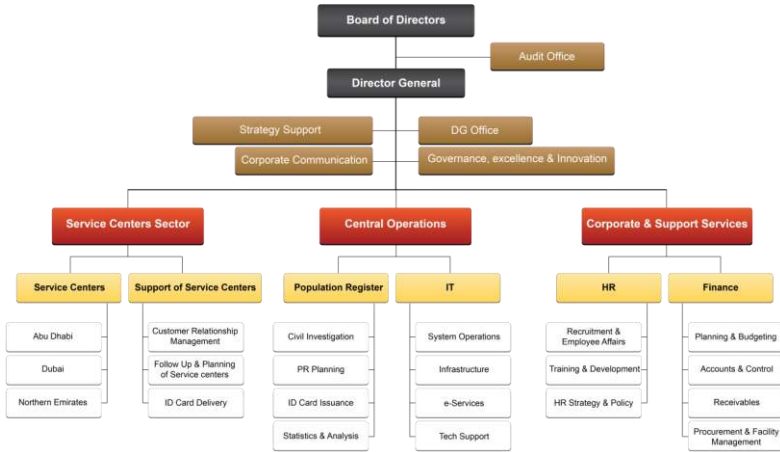


Figure 23: Emirates ID’s organization structure

6.3.2. Policies and Procedures

The Authority developed a set of umbrella policies and procedures to guide decision making and dealing with operational know-how (and know-why). These were aligned with the EFQM model’s criteria. See Figure 24.

For a long time, the role of policy in organizational management has remained vital and is viewed as a mechanism for instituting organizational control over resources (Buchanan and Huczynski, 1997). These policies and procedures were viewed and designed to foster knowledge retention and meet the cognitive orientation in the organization. They therefore went through different iterative review cycles to capture both implicit and explicit knowledge to enhance knowledge retention.

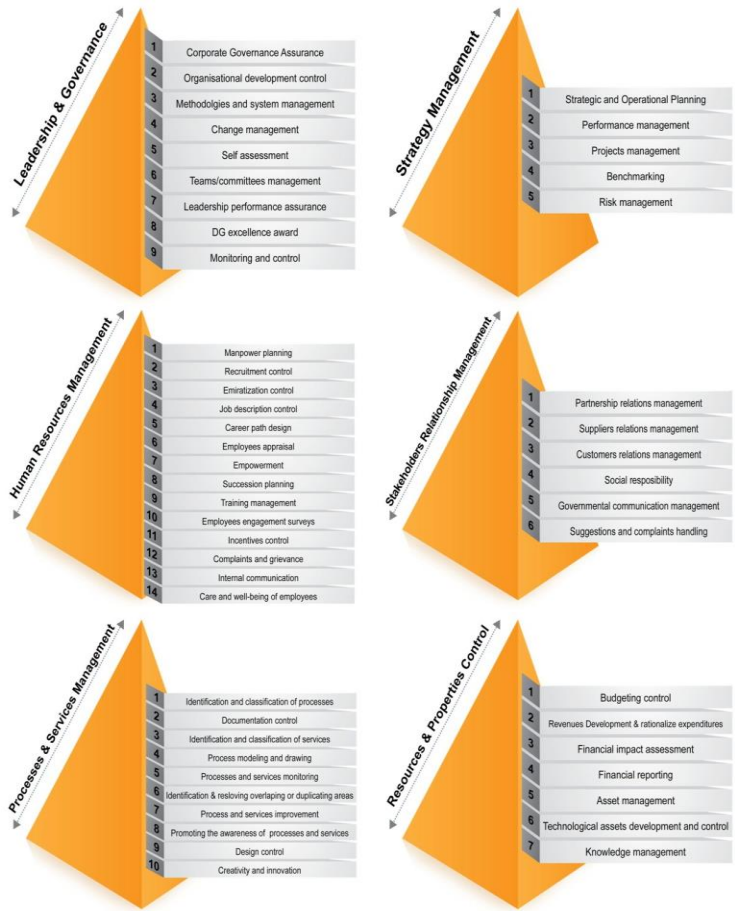


Figure 24: Primary and subpolicies and procedures adopted at the Emirates ID

6.3.3. Performance Management System

Performance in organizations is multidimensional and can be in principle understood across the dimensions of productivity (output), efficiency (output/input), effectiveness (utility, benefit), and quality where the typical measure may focus on teams/groups/units, individuals, and the organization (Kaplan, 2001; Richard et al., 2009).

The Authority tested different performance management systems and it finally decided to follow the balance scorecard (BSC) to measure and monitor performance at individual, departmental, and institutional levels. BSC was viewed as providing a more balanced measurement of organizational strategic performance with both financial indicators and nonfinancial indicators. BSC was also observed as a strategic learning system that can amend business theory and organizational strategy through monitoring corporate performance from its knowledge management activities (Kaplan and Norton, 1996, 2000).

Using employee surveys and analysis of training data, the Authority measured the degree of learning and growth, allowing leaders to assess the potential for long-term success. Although performance data depended largely on subjective interpretation, performance outcomes needed to be continuously re-assessed to ensure that they represented the best business performance with respect to perceived realities.

BSC was also used as a mechanism to store and manage knowledge. Through the management of this knowledge, the Authority was able to measure its performance by giving that knowledge a value. This, in turn, got management to focus on who used such aggregated knowledge to refine their performance measures contained in their scorecard. This then created more knowledge and so the cycle continued. Over time, this intellectual capital was seen just as important as any other piece of capital and asset in the organization (Myles and Jackson, 2004).

6.3.4. Work Environment

“One factor that affects knowledge worker performance that isn’t well understood is the physical work environment—the offices, cubicles, buildings, and mobile workplaces in which knowledge workers do their jobs.” (Davenport, 2005)

The Emirates ID, as part of its organizational transformation, embarked on an initiative to redesign its workplace environments to make employee collaboration and communication easier and heighten productivity. The new work environments featured open spaces, flexible layouts, and functional furniture. The office designs not only promoted transparency but also improved employee satisfaction, utilized space better, and increased overall customer satisfaction. Additional features were added

to the centers such coffee shops, open-access Internet Wi-Fi, parking spaces, etc.

6.3.5. *Knowledge Management and BI Systems*

Information technology and systems can provide effective support in implementing knowledge management (Borghoff and Pareschi, 1997; López et al., 2009). Knowledge management systems refer to any kind of IT system that stores and retrieves knowledge, improves collaboration, locates knowledge sources, mines repositories for hidden knowledge, captures and uses knowledge, or in some other way enhances the knowledge management process (ibid.).

The Emirates ID employed numerous information IT management systems to enable key business functions. These systems ran sometimes in isolation in the beginning and much data consolidation was done manually. A knowledge management system designed to capture and make well-timed information available was imperative. Therefore, the Emirates ID decided to implement business intelligence applications to provide analytical representations of business operations and produce information to help management and employees understand, improve, and optimize business operations.

Furthermore, the Emirates ID moved towards the use of business performance management (BPM) applications that put these measurements into a business context. This helped the Authority to relate the data measurements to business goals and objectives. Putting performance measurements into a business context greatly improved the business decision-making and action-taking.

The decision support systems embedded knowledge management principles that were necessary to achieve intra-organizational knowledge bases as the use of corporate data to derive and create higher-level information and knowledge. They also supported the integration of organizational information to support all departments and end-users and the provisioning of tools to transform scattered data into meaningful business information (Bolloju et al., 2002).

These decision support systems also supported the organization to push decision-making to lower-level functionaries, executives, and workers. This distribution of power, in effect, has had far-reaching implications on the overall performance of the organization.

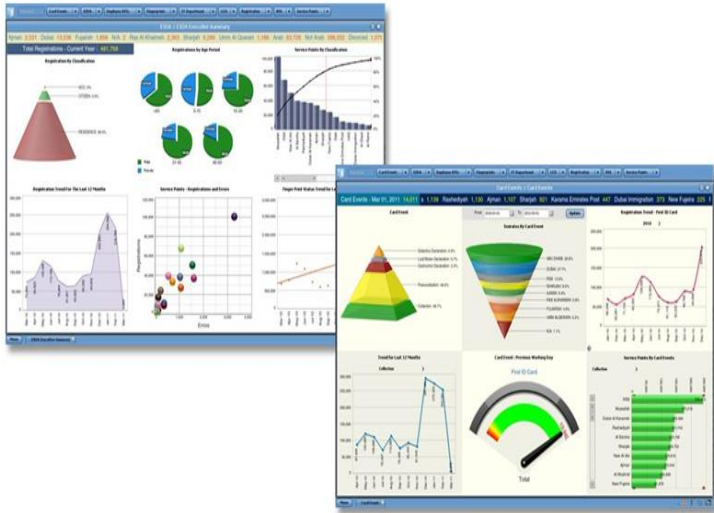


Figure 25: Business intelligence systems at the Emirates ID

6.3.6. Business Process Reengineering

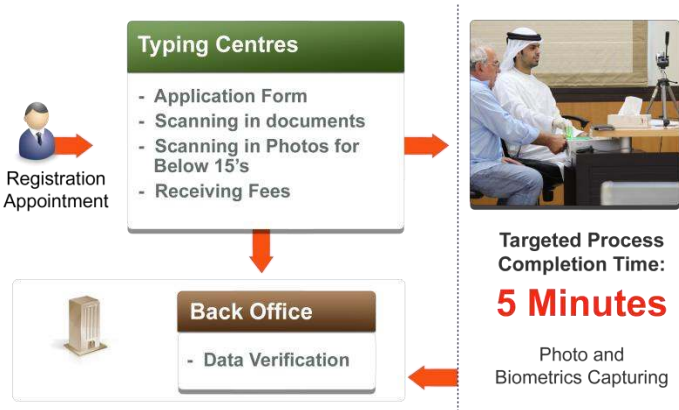


Figure 26: New registration process after BPR at the Emirates ID

The Emirates ID initiated a business processes reengineering (BPR) project that represented fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical performance measures such as cost, quality, service, and speed. This involved the redrawing of organizational boundaries, reconsideration of

jobs, tasks, and skills, and streamlining of operations by eliminating redundant or unnecessary processes.

Using both tacit knowledge of employees through their involvement in the design phases, and available explicit knowledge in documents and procedures, the Emirates ID was able to direct the organizational knowledge towards the standardization and thereafter to the automation of processes. This helped the organization achieve significant results as depicted in Figure 27.

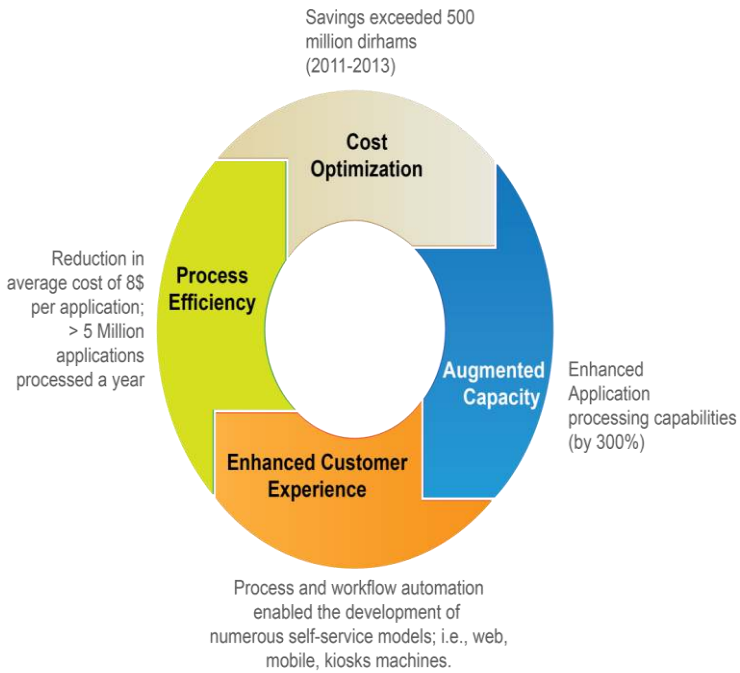


Figure 27: Re-engineering key benefits

6.3.7. Supporting Institutional Development of Knowledge Management Capacity

The Emirates ID also implemented various approaches and activities to support the development of institutional capacity for knowledge management. Some of the important ones are captured and described in the following subsections.

6.3.7.1. Emirates Centre for Organizational Learning

The literature asserts that the knowledge management paradigm lies beyond the organizational learning boundary (Nevis et al., 1998). Besides, the increasing importance of knowledge assets or intellectual capital suggests an intensifying need for individuals and organizations to increase their store of knowledge (ECTQM, 2003). To increase stores of knowledge, organizations then need to learn continuously (Aubrey and Cohen, 1995). Thus, the concept of organizational learning is regarded as an essential element of knowledge management.

The Emirates Centre for Organizational Learning (ECOL) was established to support the building of institutional knowledge and creativity. The center considers knowledge management a cornerstone for organizational learning. ECOL adopts a five-category classification of knowledge management functions as depicted in Table 6.

Table 6: ECOL knowledge management classification

KM Function	Description	How ECOL contributes to KM implementation at Emirates ID
Intermediation:	Knowledge transfer between knowledge producers and knowledge consumers. Simply it is matchmaking between providers and seekers in order to have efficient transfer.	<ul style="list-style-type: none"> • Finding, gathering, filtering, and mapping knowledge to be transferred. • Identifying relations among building blocks of knowledge. • Identifying the knowledge flow routes throughout the Emirates ID and with its stakeholders.
Externalization:	Transform explicit knowledge into tacit knowledge (as indicated earlier), which can help in continuous improvement, open innovation, and market intelligence.	<ul style="list-style-type: none"> • Emirates ID have almost covered this function. ECOL conducts health checks to ensure that the Explicit Knowledge Portal is being maintained, updated, and revised.
Internalization:	It is a kind of reversal process for the previous function where knowledge is extracted from various sources and communicated to the knowledge seekers.	<ul style="list-style-type: none"> • Developing new knowledge through abstracting relevant knowledge that matters to Emirates ID and its stakeholders. • Ensures understanding and learning through awareness campaign and professional formal training.

Cognition:	Exploitation of knowledge in making informed decisions.	<ul style="list-style-type: none"> • Enables and monitors the actions and decisions being made using the available knowledge. • Adding its analysis and value to information to create knowledge.
Measurement:	Measuring all activities and investments that have been put into managing the other four functions.	<ul style="list-style-type: none"> • Provides instruments to measure knowledge provision, consumption, utilization, and effectiveness.

6.3.7.2. Knowledge Libraries

The Emirates ID also supports knowledge management by creating physical knowledge repositories; i.e., libraries that store knowledge and information in a documentary form. The main library is located at the head office (named the Excellence Centre and referred to as Organizational Memory), and several others geographically distributed across its centers named Knowledge Corners. These libraries basically store all explicit knowledge generated within the organization (structured internal knowledge), such as policies and procedures, reports, memos guidelines, minutes of meetings, etc., and other types of knowledge acquired from external sources (competitive intelligence), including books, journal articles databases, external reports, government information, etc. These libraries are also equipped with digital discussion databases that store “know-how” representing informal, internal, and tacit knowledge.

6.3.7.3. Web Portal: Massive Knowledge Repository

Among the very critical success factors for knowledge management is determined by how well the organizations represent, store, process, and disseminate knowledge. Here, the emphasis is on connectivity, access, and transfer. We have already pointed out some of the technologies employed at the Emirates ID in an earlier section (Section 6.3.5). In addition, the Emirates ID has put in place a web-based, single-window platform to disseminate knowledge, a knowledge portal hosted on internal networks (Intranet), and a web portal accessible by public (Internet).

These two content management-based channels also embed tools to enable employees and customers to broadcast their suggestions and/or

problems. The Emirates ID actively shares information on its portals and Intranet sites and encourages people to actively contribute to its knowledge base. CRM, risk management, and feedback systems provided the Authority with analytical data that enabled it to reach better decisions in organizational growth powered by the learning that these systems generated.

In general, data are organized in categories to facilitate knowledge storage and easy access to the content, and an advanced search engine facilitates knowledge mining within the databases. Various computer-backed visualization systems are also in use for enabling advanced analytics, business intelligence, data management, and predictive analytics.

6.3.7.4. Gamification for Knowledge Transfer

Gamification is the use of game mechanics and psychology to drive a specific set of desired behaviors within a target audience (Trees, 2013). The use of gamification is widely gaining popularity as it is argued to have helped successful organizations accomplish their knowledge management objectives through recognizing and rewarding staff members who demonstrate the desired collaborative behaviors.

Similarly, the Emirates ID introduced gamification on different levels on the assumption that people will be motivated to advance or “win” in the context of the game.

One example was the embedding of a “car race” concept into the back-office data audit application screens. Every day, employees choose a car that they would like to enter the race with. The system shows the performance of all employees based on their speed and quality of audited applications in the form of cars racing with each other. All employees were able to see and compare their performance with their colleagues from all over the country. The best performing employees (cars) are recognized each month with awards and prizes. This had a significant impact on the overall performance of staff that pushed employees to collaborate and learn from each other how to improve their individual performances. Figure 28 depicts a screen shot from the back-office system.



Figure 28: Back-office application form

Another example of “gamified” knowledge management was linked to the suggestions system where employees received competitive scores called KODO points based on the number of suggestions they made. The more feasible the suggestion, the higher the score. Employees also earn points for each best practice, lesson, or content piece they share. Different point totals are assigned for each KM-related activity from sharing a best practice to writing a blog post on the website or answering a discussion forum question.

Employees who reach certain point thresholds are awarded appreciation certificates and badges to display on their internal networking profiles. Those with the highest number of KODO points can, at any given time, convert their points into prizes like iPads, smart phones, etc.

The Emirates ID also extended this approach to take a more expansive view of gamification by embedding elements of game design and mechanics into a variety of virtual and in-person employee engagement activities (e.g., some weekly management meetings are held in different environments such as football stadiums, snookers tables, etc.). This was further expanded to add gamification to the Authority’s web portal and customer service interactions, e.g., ASK Hamad, a cartoon character who interfaces with customers and answers questions online on twitter and the web portal.

The Emirates ID also uses gamification to capture organizational knowledge in short cartoon videos and pass them to both employees and customers to enhance their awareness of work-related processes and procedures. This proved to be a more effective mechanism to engage people and offer them the opportunity to reflect and refine work elements.

6.3.7.5. Knowledge Documentation

Part of its overall efforts to develop more a conducive work environment that is based on the principles of effective knowledge creation, transfer, and use, the Emirates ID paid considerable attention to raising the awareness of knowledge management by documenting and sharing knowledge. It launched internal competitions and awards for contributions to the organization's structured knowledge base. This resulted in a large database of documented knowledge including lessons learned and best practices.

6.3.7.6. R&D

The Emirates ID recognized the relationship between knowledge capital and research and development (R&D) and as a process to foster knowledge for developing innovation. It thus supported its staff to engage in research activities through different incentive schemes.

Through collaboration with many scientific institutions, the Emirates ID published more than 100 journal articles and magazines between 2009 and 2014. These exploratory nature and action-based research studies carried out by the Emirates ID yielded in the development of several novel knowledge intellectual capital/properties that helped to shape its core functions and corporate excellence practices.

The Emirates ID today is renowned for its contributions to the existing body of knowledge in both technical and organizational practices. The Emirates ID's scientific publications have been widely quoted by researchers and governments, were included in 2012 in United Nation's Library in New York and Washington, and were described as "valuable work."

6.3.7.7. Supporting Knowledge Societies

The Emirates ID has been actively participating in the organization of international conferences and workshops to support the development of knowledge societies. These events promoted the establishment of a network of organizations in the industry and supported the flow of, and access to, data, information, best practices, and new knowledge. They also represented a good opportunity to build an international consensus on the newly required norms and principles and to keep pace with innovations. The direct outcome of these events also supported the organization in leapfrogging knowledge development stages and addressing organizational development priorities.

6.3.7.8. Benchmarking and Knowledge Sharing

According to Watson (1994), benchmarking is a business practice that stimulates process improvement by determining best practices across organizations through performance measurement, thereby helping understand these factors that enable the higher performance of leading organizations. In a similar vein, Camp (1989) defines benchmarking as the search for industry best practices that will lead to superior performance. The Emirates ID uses benchmarking approach to continuously assess its state of knowledge and to focus on necessary improvements.

The Emirates ID has also contributed to knowledge development through its active membership in international knowledge associations. It also participated in the preparation and review of several national and international standards and frameworks that are used today for benchmarking.

6.3.7.9. Following standards

To avoid re-inventing the wheel, the Emirates ID decided to adopt international standards and codes of practice in different technical and management fields. This was based on its management belief that adherence to such standards would ensure that its functional processes meet the requirements and are consistent with the industry codes of practice.

These included standards serving quality management, customer service, IT processes, social responsibility, and other functional areas of business. These standards also offered concepts, principles, guidelines, and criteria for establishing, maintaining, and improving the processes by which the Authority defined and achieved its goals. They also helped streamline processes and establish guidelines that were followed by every employee to execute their tasks. These standards and systems helped the Emirates ID in the collection and maintenance of knowledge through a standardization process.

6.3.7.10. International Awards for Innovation and Best Practices

The Emirates ID instituted several awards for excellence in organizational learning as well as for innovation. These awards go a long way in promoting organizational excellence and serve as major motivational factors and accord recognition to the achievers. The awards typically invite ideas and research papers in different fields of practice (in identity management and corporate excellence). Received articles are then added to the knowledge repository. Reported gains were multifold as they were used to challenge existing approaches and thereby improving them.

Having said that, the next stage explains how knowledge management value is interpreted at the Emirates ID.

6.4 Stage 4 (Why?): Bottom-Line Business Results

Since its establishment in 2004, the Emirates ID faced numerous challenges to fulfill its purpose and objectives (Al-Khoury, 2007; 2011). The application of knowledge management at the Emirates ID focused on enhancing the performance of the Authority in delivering its core objectives. It also acted as a guide to help employees acknowledge their importance in the organization and provided them the means to aggregate their knowledge and link it with the organization's overall objectives. The iterative nature of knowledge management processes played a key role in enhancing communication effectiveness.

In essence, the scope of this knowledge management endeavor was regularly assessed to serve the goals and aspirations of the Authority. This has enabled it to satisfactorily solve various issues related to conflict areas,

organizational practices and conduct, as well as the making of more informed decisions. Knowledge management processes supported the revisions carried out to redefine job descriptions, procedures and work processes, and organizational restructuring. With the balanced scorecard approach adopted at the Emirates ID, the results of the data analysis revealed sufficient evidence to establish a correlation between knowledge management, organizational culture, organizational learning, and pursued organizational outcomes.

6.4.1. Strategy Fulfillment

The overall strategic framework and the use of knowledge management at the Emirates ID have enabled it to cultivate enormous productivity and achieve its strategic targets. As depicted in Figure 29, the Emirates ID achieved 97% of its strategic objectives and targets for its strategy cycle in 2010–2013. The Authority is recognized as the best federal organization in the UAE and is considered as a benchmark for best practices on national and global scales.

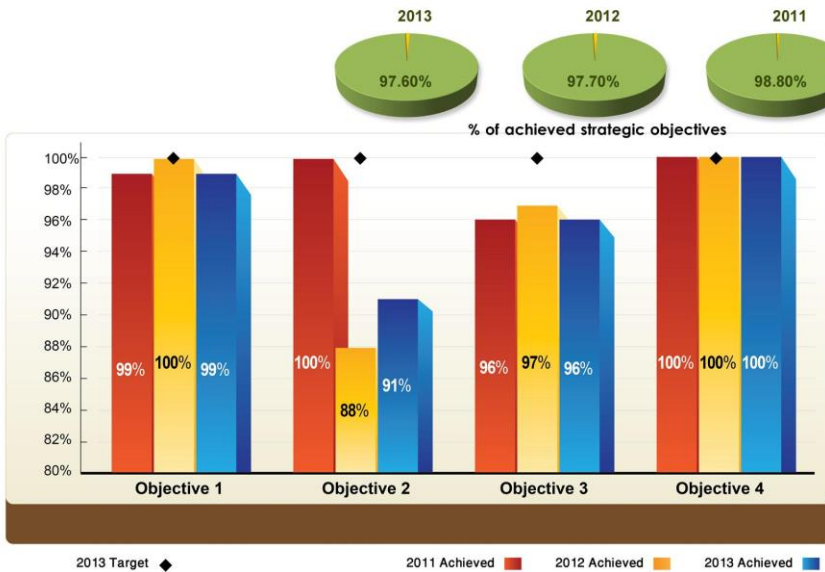


Figure 29: Emirates ID's strategy results (2011–2013)

6.4.2. Employees Productivity and Satisfaction

With extensive training and coaching, the management teams at the Emirates ID have succeeded in undertaking positive transformations and support monitoring for improving their employees' competence. Enhancing knowledge and talent management at the Emirates ID has widened its scope for productivity gains with respect to the Authority's targeted goals and tasks.

The overall environment at the Emirates ID encouraged teamwork and collaboration. Through the use of knowledge management practices, the Emirates ID managed to usher in a new form of employee motivation that focused on developing knowledge workers. Different adopted reward schemes supported performance and productivity. But most importantly, the leadership style at the Emirates transcended to become more of an "inspirational" rather than "supervision" to support competitive excellence of knowledge workers (Drucker, 1994; Mintzberg 1998).

On a different note, the Emirates ID observed a strong relationship between the degree of satisfaction and the level of employees' productivity. Satisfied employees were more motivated and they reposed more pride in their jobs (Siguaw et al., 1994). As depicted in Figure 30, employee's satisfaction showed a growing trend, up from 52% in 2009 to 77.52% in 2013.

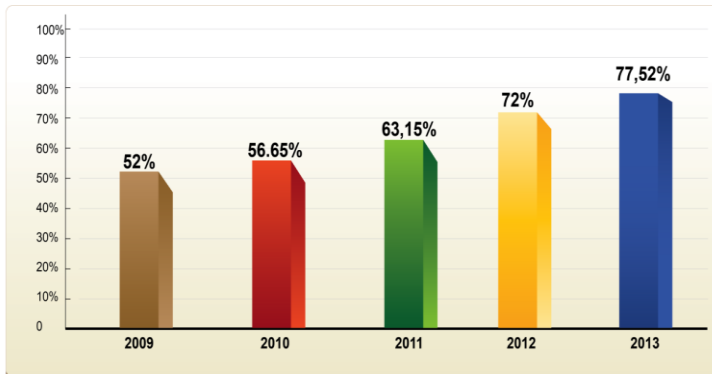


Figure 30: Employee satisfaction survey results (2019–2013)

6.4.3. Customers Satisfaction (Service Quality, Efficiency, and Effectiveness)

Knowledge management practices enhanced customer knowledge at the Emirates ID. For example, it played a key role in improving contact center

and customer service interactions. CRM technologies provided the ability for customer service representatives to access the right information at the right time, thus enabling more knowledgeable, efficient, and effective customer service interactions with greater speed, accuracy, and consistency.

The different knowledge management technologies supported the development of multiple interaction channels with employees and customers. See Figure 31. This, in turn, improved service efficiency as well as the quality and consistency of communications. As more and more customers opted for electronic channels, this greatly impacted overall customer satisfaction and lowered operational costs. Figure 31 depicts the increasing trend of customer satisfaction from 2009 to 2013.

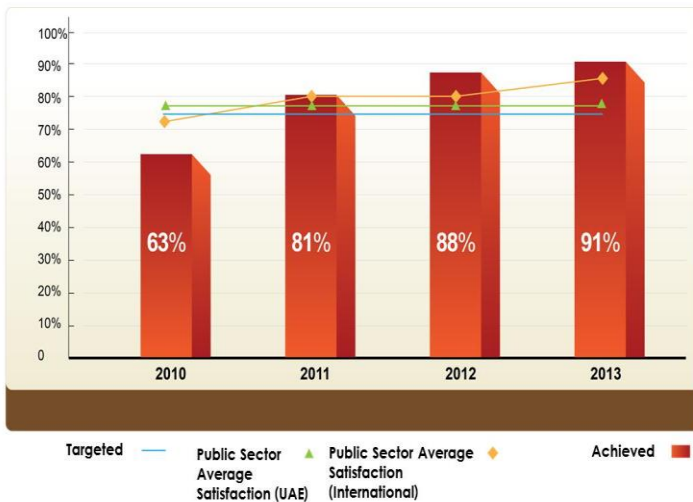


Figure 31: Emirates ID customers’ satisfaction results (2010–2013)

6.4.4. Financial Results

Knowledge management had a direct impact on the financial performance of the organization. Savings exceeded hundreds of millions and supported the Authority to become self-sufficient in terms of financing its annual budget, despite the fact that the annual budget went up three-fold in the second year of operation. The business process reengineering initiative saved more (\$136) million in less than three years in operational costs, as explained in Section 6.3.6.

6.4.5. Organizational learning and Innovation

The degree of innovation impacts the extent of new knowledge entrenched in an innovation (Dewar and Dutton, 1986). Organizations having greater innovative talent will achieve better results from the environment and will be able to easily obtain the capabilities desired to improve organizational performance and gain a sustainable competitive benefit (Calantone et al., 2002).

The Emirate ID supported the development of a learning-oriented culture in its efforts to modernize and transform the organization. The Emirates ID observed a correlation between organizational learning culture, job satisfaction, and innovativeness (Sabir and Kalyar, 2013). See Figure 32.

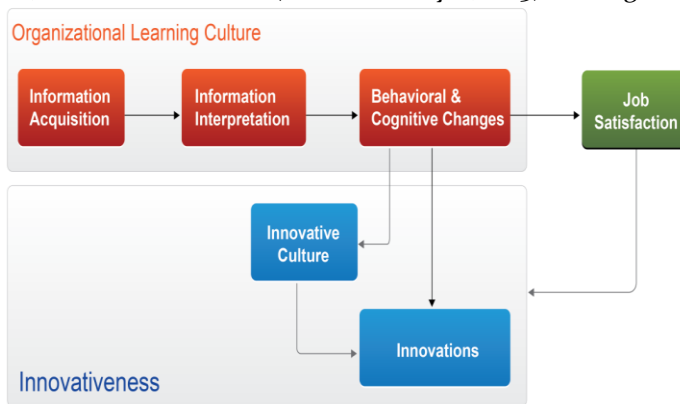


Figure 32: Interrelationship between organizational learning, job satisfaction, and innovation

Source: Sabir and Kalyar (2013)

According to an assessment conducted in the first quarter of 2014 to assess innovation management performance and capability based on the IMP³rove Assessment¹⁰, the Emirates ID was shown to be above average for the benchmarked class and close to the rate of global growth champions. This evaluation assessed the five dimensions of innovation: strategy, organization and culture, life cycle processes, enabling factors, and results. Figure 33 depicts the IMP³rove framework and an overview of Emirates ID's score.

¹⁰ IMP³rove® is a unique approach to improving innovation management performance with sustainable impact. It is an initiative of the European Commission to enhance the innovation capabilities of small and medium sized enterprises. See also European Commission (2010).

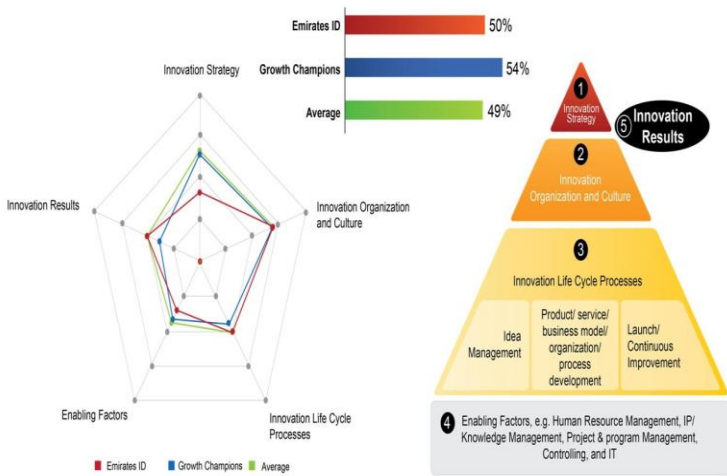


Figure 33: Emirates ID’s IMP³rove assessment results

Having said that, the next section will provide a short reflection on the adopted approach at the Emirates ID and some key learned lessons.

Reflection and Lessons Learned

“We need to make knowledge accidents happen on purpose, regularly and, most importantly, with intent.” Al Zollar, GovTechC, June 2002

At the Emirates ID Authority, knowledge was perceived as business. As a National Identity Issuer, the Authority dealt with data, information, and knowledge. The Authority formulated its knowledge management following the knowledge management framework outlined in Figure 34. The framework gives a generalized model that was used by the Emirates ID in eliciting knowledge as part of its knowledge management process. The knowledge management essentially consisted of six pillars:

1. Innovation and creativity support: Organizations need to develop skills for promoting innovation and creativity among its resources.
2. This needs to be effectively backed by an Information Management system to ensure the good dissemination of information across the organization.
3. Knowledge-based systems deployment ensures a structured information flow.

4. Leading to building of Intellectual Assets and generating Intellectual Capital for the organization.
5. Organizational learning is to be encouraged and promoted actively bringing in the much desired transformation.
6. Organizational Transformation would then be resulting and leading to further innovation.

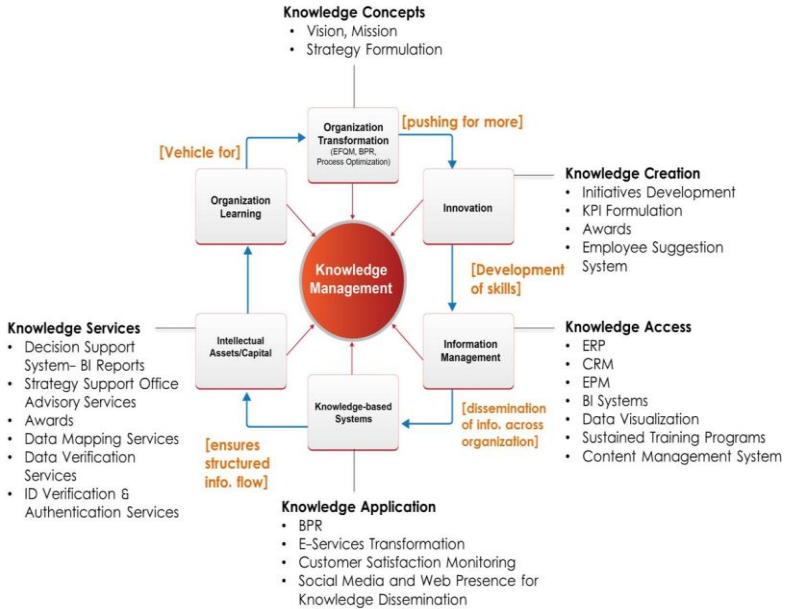


Figure 34: Emirates ID's knowledge management framework

The use of a sound knowledge management system was one key driving force behind the Emirates ID's success. The application of modern knowledge management techniques and the holistic approach contributed to the enhancement and development of new capabilities. Its determination and motivation to build a knowledge-sharing culture produced enhanced performance through effective teaching and learning.

Organizational transformation was brought about by a clear communicated strategy. Knowledge concepts came from the vision and mission that was carefully defined for the organization. A clear, well-formulated strategy laid the foundations of knowledge management needs in the organization. Benchmarking studies were carried out during the

strategy formulation phase to bring in international learning into the organization's cadre.

Numerous initiatives were defined to achieve the strategic objectives that were designed to accelerate the objective achievement strategy fulfillment. The different IT systems and processes (Employee Suggestion System, Awards, KPIs, etc.) led to incubation of innovative ideas in the organization. The integrated tools that were deployed enabled the organizational work data to be captured in near real time (e.g., resource planning, project management, process management, content management, etc.). A corporate-aligned IT strategy ensured that information was managed to provide data visualization and provided a decision support system for the organization. Knowledge gained from sustained operations was applied in areas enhancing operational efficiencies. All that constituted the building blocks to the implementation of knowledge applications and the development of knowledge services.

Business processes were re-engineered based on the customer feedback and monitored performance KPIs. As continuous learning resulted in organizational transformation, service delivery transformation and e-service development were achieved through knowledge application. Further customer knowledge was harnessed by the social media presence that resulted in higher customer satisfaction. This, in turn, enabled the Authority to roll out innovative knowledge-based services. Remote identification and authentication services with value-added data services were rolled out to customers. For the decision makers, intuitive dashboards provided timely inputs. Data mapping services were rolled out to enable accelerated e-transformation for the nation's service providers.

This did not of course come easy. The Emirates ID went through three cycles of strategy formulation and review over a period of nine years in 2005–2013 for course correction. The first three years of operations yielded only about 10% of its strategic objective being achieved against a targeted 25%. From the initial years of operations, the Authority realized that knowledge mattered and the application of knowledge mattered, too. Conscious and diligent efforts were made to consolidate the knowledge to bring about acceleration in strategy fulfillment.

Internal studies led to identification of key factors for effective knowledge management at the Emirates ID. See Figure 35.



Figure 35: Key factors identified as enablers of effective knowledge management at the Emirates ID

Strong leadership was identified as the major enabler. Leadership for the organization meant empowerment, decentralization, and ownership. The organizational culture had to change from a work orientation to a service orientation. Customers had to be placed first and in the center of all operations. The organizational vision had to be clear and, more importantly, well communicated across the organization and among all stakeholders. Transparency in operations and information flow was required. Organizational restructuring and consequent changes had to be managed on a sustained basis.

Apart from the enablers, several accelerators were identified that enabled (successfully) strategic objectives achievements, as depicted in Figure 36.

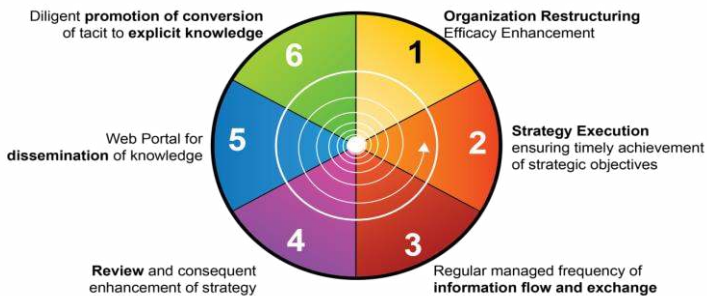


Figure 36: Key accelerators for knowledge dissemination at the Emirates ID

Organizational restructuring had to result in efficacy enhancement. Strategy execution assumed prime importance with KPIs providing information on the strategy performance. Time was of the essence and time-bound KPIs were enforced to be monitored. Information systems had to be strengthened where corporate communications was the key and an effective dissemination system had to be deployed. Web Intranet and Extranet portals provided an efficient mechanism for information and knowledge dissemination as well as provided an effective channel for e-services.

A major accelerating factor was in enabling tacit knowledge to be converted diligently to explicit knowledge. The Authority achieved this, albeit after its initial faltering steps. Blogs were encouraged. Experiences were documented and published. Numerous papers were presented and published in various journals and were consolidated for access on the web portal. An Employee Suggestion System was duly implemented with best suggestions awarded. The number of suggestions continued to be received were prime examples of the tacit knowledge transformed to explicit knowledge in the public domain. In general, the Emirates ID used a blend of approaches to ensure the success of its knowledge management initiatives. These different approaches are depicted in Figure 37.

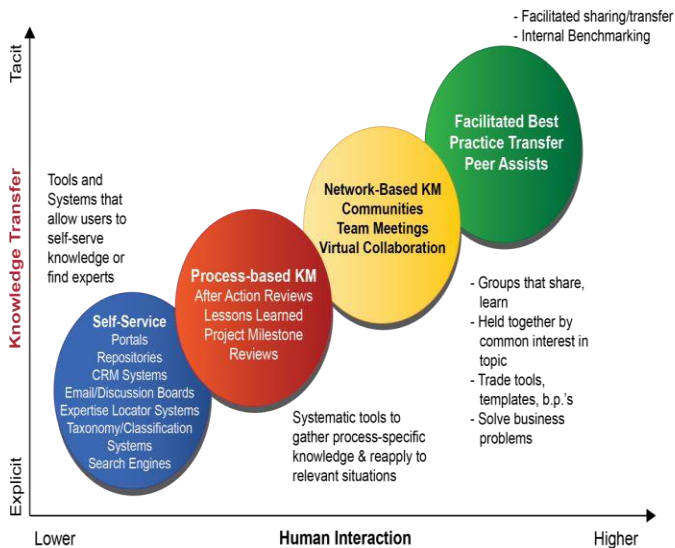


Figure 37: Knowledge management approaches used at the Emirates ID
Source: APQC (2012)

Conclusions

“If you have knowledge, let others light their candles in it.”

Margaret Fuller, American journalist (1810 –1850)

Knowledge is the most important asset to any organization. Managing knowledge has been developed and will continue to be developed to supplement innate human knowledge management skills (Mohayidin et al., 2007). Simply put, knowledge management is all about converting implicit knowledge (knowledge that is available and hidden) into explicit knowledge so that it is out in the open benefiting everybody. See Figure 38.

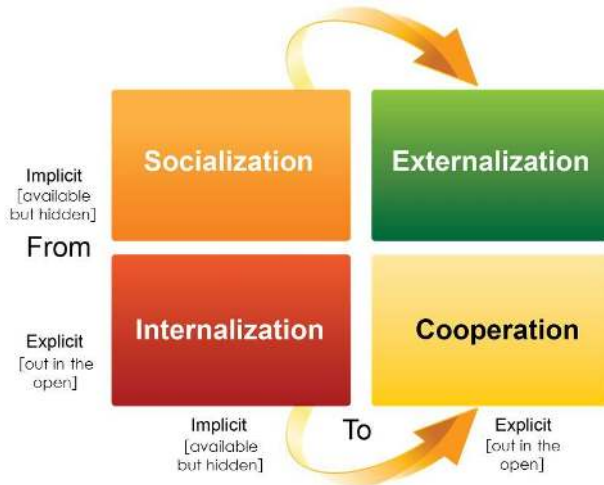


Figure 38: Knowledge conversion

Source: Based on the work of Nonaka and Takeuchi (1995)

As outlined, knowledge management assumes that a great deal of organizational knowledge is tacit in nature and that formal controls, processes, and technologies are not sufficient for transmitting this type of understanding. Rather than building formal systems to manage knowledge, the focus of organizations needs to shift towards building social environments and practices necessary to facilitate the share of tacit understanding (Brown and Dugid, 2000; DeLogn and Fahey, 2000; Gupta and Govindarajan, 2000; Hansen et al., 1999; Wenger and Snyder, 2000).

This article attempted in its first part to provide an overview of the field of knowledge management. The review of the literature suggests that knowledge management is indeed a desirable endeavor to foster sustainable

development (Sharma et al., 2007). However, the key to successful knowledge creation and sharing is found to be complex and multi-dimensional (ibid.). Such complexity requires sophistication in the culture of its talent and governance (Houghton and Sheehan, 2000).

With the huge literature written on knowledge management, the challenge lies in the existing body of knowledge that focuses on knowledge management as a general discipline with an emphasis on international and national policies and in a comprehensive course of action. Existing literature lacks qualitative studies that illustrate how government organizations practice knowledge management to improve performance. On the flip side, the literature is full of examples from private and commercial organizations. The second part of this article attempted to address this gap in knowledge. The presented case study elucidated how one of the most successful government organizations in the UAE has implemented knowledge management to foster productivity and organizational excellence. We showed how the approach followed at the Emirates ID facilitated the implementation, instillation, and application of knowledge management throughout the organization and to achieve organizational objectives.

Further work is certainly needed to validate the approach presented here and to test its applicability in other organizations. Indeed, there is no one-size-fits-all way in knowledge management. To create value, organizations need to focus on how knowledge is used to build critical capabilities (Donoghue et al., 1999).

Nonetheless, the qualitative nature of the presented case study provides critical insights that should help understand how government organizations practice knowledge management in inter-organizational networks. Taking into account the limited literature available from developing countries and Arab countries in specific, this article is considered of particular value to the existing body of knowledge.

All in all, the development of knowledge management field is very much dependent on how well we design the sharing process (D'Antoni, 2007). It is also becoming increasingly clear that it is simply not enough that we depend on traditional patterns to meet our objectives (ibid.). Learning from different cases is imperative to better understand how government organizations practice knowledge management.

On the macro level, knowledge management sets the foundation to support the development of nations and drives economies with a direct

impact on enhancing the quality of people’s lives. We are of the view that knowledge management should be strategized on national levels and execution must be measured by the performance of different organizations in a country.

Primarily, organizations and nations alike need to pay higher attention to the six dimensions of knowledge management: knowledge creation, knowledge conceptualization, knowledge application, knowledge access, knowledge services, and knowledge economy. See Figure 39.

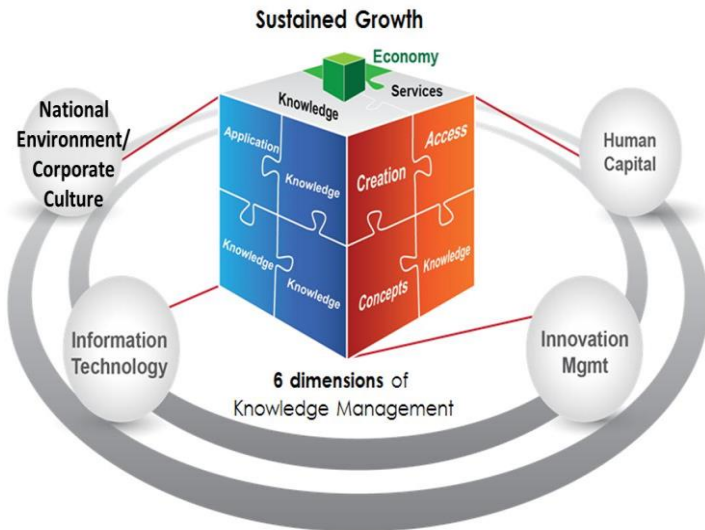


Figure 39: Building a national/corporate knowledge management framework

This then needs to be tethered to human capital development plans, innovation management, effective utilization of information technology, and national environment/corporate culture. It is such frameworks, when adopted, that will lead nations on their path to accelerated progress with all-round development and when tied to national objectives to achieve specific outcomes. The economic contributions of such frameworks will result not only in developing sustainability, but also in serving to generate accelerated national growth rates through shared intelligence and higher levels of innovation.

In conclusion, knowledge plays a key role to human and sustainable development. This is a field of practice that requires more attention in developing countries and, more specifically, in the Arab world. The quote below is from the World Bank, and though brief, it emphasizes a strong message:

KNOWLEDGE IS LIKE LIGHT. Weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere. Yet billions of people still live in poverty unnecessarily. Knowledge about how to treat such a simple ailment as diarrhea has existed for centuries but millions of children continue to die from it because their parents do not know how to save them. (World Bank, 2011)

True knowledge management comes through the development of mankind. True knowledge is about harnessing the truth and applying it for the betterment of the world. Many lives can be saved with a little knowledge. Many nations are built with knowledge. Knowledge is for development. There are many global initiatives designed to harness the power of knowledge and improve the lives of everybody who lives in this world. But let us always remember that it is a responsibility for all of us.

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Annex-1: Knowledge Management—The Case of Japan

Why have Japanese companies become successful? Their success is not only due to their manufacturing prowess; access to cheap capital; close and cooperative relationships with customers, suppliers, and government agencies; or lifetime employment, seniority system, and other human resources management systems. Japanese companies have been successful because of their skills and expertise at “organizational knowledge creation.”

Organizational knowledge creation is the key to the distinctive ways that Japanese companies innovate. At the end of World War II, Japan was devastated. Yet, in a few decades, it has risen to be a superpower widely acknowledged as an economic powerhouse.

Nonaka and Takeuchi (1995) perfectly capture the essence of this success. Japan over the years emerged from an occupied territory to a country that owned landmark assets in the United States. As the Japanese economy grew, largely due to excellence in manufacturing and innovation, Japan looked outward with acquisitions and manufacturing bases set up in the United States.

The following comparative maps of 1985 to 2012 show the trend of Japanese investments in the world, including remarkable takeovers and investments in the United States and Europe. Columbia Pictures (Sony), MGM (Sony), Rockefeller Center (Mitsubishi), and EMI Music (Sony) are some of the acquisitions that can be cited as prized American trophies for the Japanese.

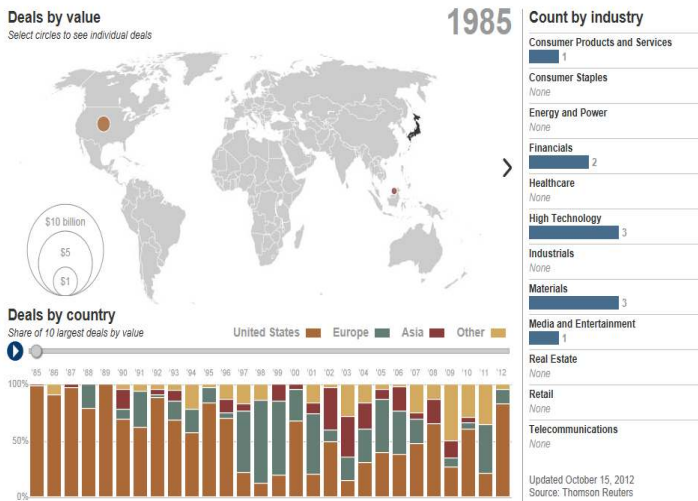


Figure A-1: Japanese investments around the world (1985)

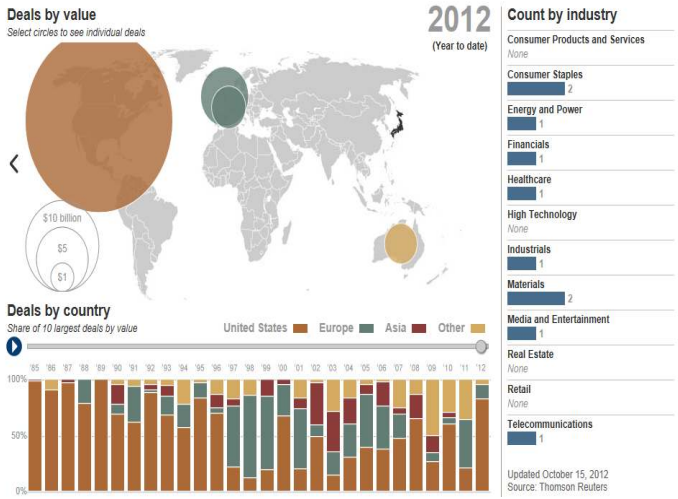


Figure A-2: Japanese investments around the world (2012)

How and why did this happen? This is largely attributed to the hard work and the resilience of the Japanese and the manner in which they utilized their knowledge. The Japanese model (unlike the western counterparts) does not believe so much in knowledge management as it does in knowledge creation. This is the key to success. Nonaka and Takeuchi (1995) argue that the Japanese firmly believe that knowledge is implicit (tacit) and their environment diligently enabled knowledge creation. They further transformed the tacit knowledge into explicit knowledge for organizational gain. This is demonstrated in their SECI Model depicted in Figure A-3.

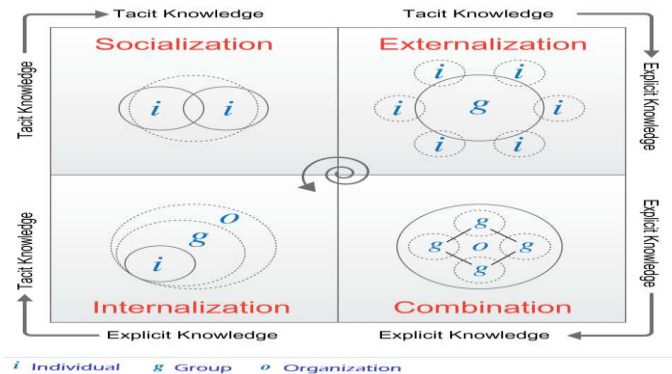


Figure A-3: Nonaka and Takeuchi's (1995) SECI Model

A brilliant example of this tacit to explicit transformation for organizational gain is given by them citing the case of Matsushita, which developed the world's first fully automated bread-baking equipment. Initially their designers could not perfect the dough kneading mechanism. A software programmer apprenticed herself with the master baker at the Osaka International Hotel, gained a tacit understanding of kneading, and then conveyed this information to the engineers, which resulted in perfecting the automated bread-baking machine.

Annex-2: Knowledge Management: The Case of the United States

The United States is an example of a successful economic superpower that used knowledge management a catalyst for innovation and development. The U.S. economy has seen many a turbulent time since the post-industrialization era. The marked rise in the U.S. economy has been seen with the transformation of the United States from a manufacturing to a service economy. This service economy has been the result of the rise of knowledge. Considering the patents as one of the measures of knowledge, we can see a marked rise of the patents from the late 1980s and early 1990s that coincides with the U.S. resurgence from the troubled times of the 1980s. This is depicted in Figure A-4.

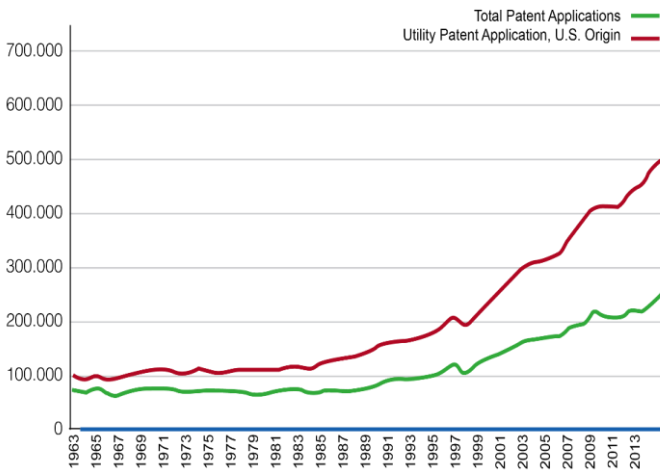


Figure A-4: U.S. Patent Applications, 1963–2013

This resurgence and success of the United States is embodied in the triple-helix model of knowledge economy (Etzkowitz and Leydesdorff, 1995) that integrates three institutions: university, industry, and government.

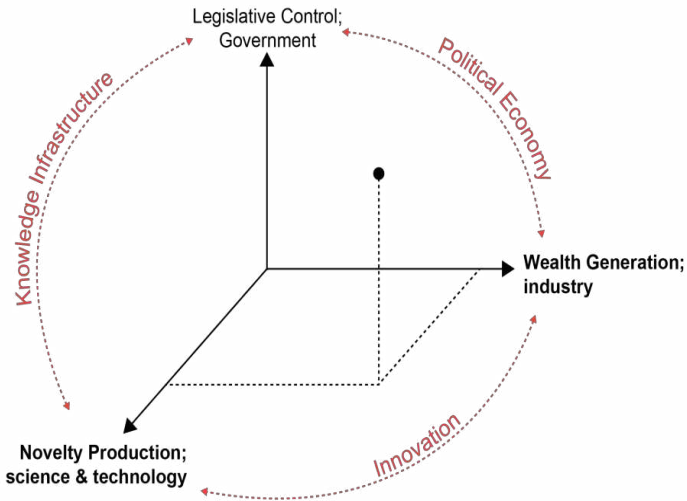


Figure A-5: The knowledge-based economy and the triple-helix model
Source: Etzkowitz and Leydesdorff (1995)

As per Loet, this triple-helix knowledge-based economy is characterized by wealth generation in the economy, innovation and creativity by organized science and technology, and governance of the interactions among these two by policy-making in the public sphere and management in the private sphere. Several incubators have been launched in the various universities across the United States that brought the academia closer to the industry.

The U.S. government enacted the Bayh-Doyle Act or Patent and Trademark Law Amendments Act on Dec. 12, 1980, which enabled enhanced research activities in the country by amending ownership rules for inventions made with federal funding. Before the Bayh-Dole Act, federal research funding contracts and grants obligated the inventors to assign inventions they made using federal funding to the federal government.

Bayh-Dole permitted a university, small business, or non-profit institution to elect to pursue ownership of an invention in preference to the government. Further, the U.S. National Science Foundation pursued the setting up of incubators supported ably by the U.S. Small Business Administration agency that undertook several initiatives to strengthen the incubation movement, leading to the current number of over a 3,000 spread across the United States (Wiggins and Gibson, 2003). The results of such initiatives are for all to see in the economic resurgence of the United States since the 1990s.