

**MURDOCH RESEARCH REPOSITORY**  
<http://researchrepository.murdoch.edu.au>



## **Alignment of knowledge and IT strategies: a case for the banking sector in the Gulf Cooperation Countries**

- Author(s):** Al-Ammary, Jaflah and Fung, Chun Che and Goulding, Paula
- Year:** 2005
- Source:** International Conference on Knowledge Management (ICKM), 7-9 July 2005, Kuala Lumpur, Malaysia.
- Official URL:** <http://ickm.upm.edu.my/presenter3.html>

This is the author's final version of the work, as accepted for publication following peer review but without the publishers' layout or pagination.

It is posted here for your personal use. No further distribution is permitted.

# **Alignment of Knowledge and IS/IT Strategies: a case for the Banking Sector in the Gulf Cooperation Countries (GCC)**

Jaflah AlAmmary

Chun Che Fung

Paula Goulding

School of Information Technology, Murdoch University,

South Street, Murdoch, Western Australia 6150

Email: [jaflah@itc.uob.bh](mailto:jaflah@itc.uob.bh), [L.Fung@murdoch.edu.au](mailto:L.Fung@murdoch.edu.au)

## **Abstract**

*Information Technology (IT) is playing a crucial role in supporting and managing the organization's knowledge assets. IT supplies the necessary collaboration, communication, and networking capabilities required for accelerating the speed of knowledge transfer and creation. This explorative research study will examine the association and the alignment between the Knowledge Management (KM) strategy and Information Systems, IS/IT strategy adopted by the banking sector in the Gulf Cooperation Council (GCC) Countries in supporting business strategy. Using the recommended model, the study will explore the impact of this alignment on the organizations' performance. The context of the GCC has been chosen because there is a need for a context-aware model for the KM in such countries. This model should consider the contextual, cultural, and technical factors that have a crucial effect on implementing KM and its strategies.*

**Key words:** KM strategy, strategic alignment, IS/IT strategy, and Business strategy, banking sectors

## **1. Introduction**

According to Zack (1999), although Information Technology (IT) represents just 10% of Knowledge Management (KM) projects and activities, it plays a crucial role in supporting and managing the organization's knowledge assets. The main role of IT in KM not just to support the digital capture, storage, retrieval, and distribution of an organization's explicitly documented knowledge. IT supplies the necessary collaboration, communication, and networking capabilities required for accelerating the speed of knowledge transfer and creation. Lindgren, et al. (2002) declared that information systems supporting knowledge

management (KM) are considered to be vital tools in order to achieve competitive advantages of an organization.

This explorative research study will examine the association and the alignment between the KM strategy and IS/IT strategy adopted by the banking sector in the Gulf Cooperation Council (GCC) Countries in supporting business strategy. Furthermore, the study will investigate the effect of this alignment on the organization's performance.

The context of the GCC has been chosen because there is a need for a context-aware model for the KM in such countries. This model should consider the contextual, cultural, and technical factors that have a crucial effect on implementing KM and its strategies. However, most of KM models and frameworks were developed based on the skills, practices and studies in the Western industrialized countries such USA and UK. It is not certain that the application of these models whether will yield the expected results from the countries in GCC.

This paper is articulated into six sections including the introduction. The next section is a survey and summary of the related studies. Section 3 describes the stages of the proposed research model. Sections 4 and 5 outline the proposed research objectives and methodology to be conducted in this research study. The paper then concludes with Section 6.

## **2. Research background**

### **2.1. KM Strategy and Knowledge Strategy**

There is a lack of common understanding of the concept of strategy as it relates to knowledge and KM. Zack (2002) contends that the terms KM strategy and Knowledge strategy are not the same. Knowledge strategy is defined as a competitive strategy built around a firm's intellectual resources and capabilities. Knowledge strategy is oriented toward understanding what knowledge is strategic and that have a high impact on the business key performance (Zack, 2002; Hofer-Alfeis, 2003). In contrast, KM strategy can be defined as a high-level plan that describes and outlines the processes, the tools, and infrastructure (organizational and technological) required to manage knowledge gaps or surpluses, and to permit knowledge to flow effectively (Zack, 2002).

Various strategic options are available to an organization for planning a knowledge and KM strategy. Some of them concentrate on the origin or the type of knowledge, while others identify different types of knowledge strategy according to the process of capturing, presenting, retrieving and using knowledge. A summary is shown in Appendix A. These strategies are not mutually exclusive, but usually one of them better describes the focus of the organization. The choice of one or a combination of these strategies should reflect the

strength of the organization, the nature of its business and the inclinations and expertise of its personnel (Wiig, 1997).

## **2.2. The alignment between KM strategy and IS/IT strategy**

The focus on knowledge and its management has led to an increasing attention towards IT as one of the most important sources of competitive advantages (Johannessen, et al, 2000 cited in European Commission, 1996). The role of IT in KM is a vital consideration for any company wishing to exploit emerging technologies to manage their knowledge assets. In addition, IT can be considered as a critical success factor in the development of an effective KM system (Egbu, Botterill, 2002).

Little empirical research has been conducted on information technology (IT) support for KM. Most of the published researches develop recommendations for successful KM, or discuss the technological tools available for supporting the management of the tacit or explicit knowledge without an empirical basis (Gottschalk, 2001). Table (1) shows a summary of some studies on the support of IT for KM. Bloodgood and Salisbury (2001), for example, have assessed the degree of fit between IT and KM strategy. They mentioned that certain uses of IT may be more common for certain types of KM strategies than others. They argued that IT can support Knowledge transfer strategy in leveraging their knowledge assets, and knowledge creation strategy in creating knowledge network and enabling communication between those who need the knowledge and those who have it. In contrast, many researches agreed on the IT support for codification and personalization KM strategy (McMahon & Lowe, 2004; Kankanhalli, Tanudidjaja, 2003). Furthermore, Bloodgood and Salisbury (2001) demonstrated that the misuse or misalignment of IT with the KM strategy can lead to adverse effects on the organization. Examples are the overemphasizing on digitalization of explicit knowledge may relegate tacit knowledge to the background. This could have a negative impact on the organization's ability to create and maintain sustainable competitive advantages (Johannessen, et al., 2000).

Comparing with the enormous works that have been done in integrating IS/IT strategy with the business strategy, there are few attempts done in discussing and exploring the relationship between IS/IT strategy and KM, among them are (Willcocks, et al, 2003) and (Okunoye, 2002). Although both studies investigated the integration between IT outsourcing and KM, they didn't evolve a detailed model or framework for the strategic association between IT/KM.

Table (1) A Summary of some studies on IT support to KM

Study	Aim and objective of study	IT support and role for KM
(Egbu, Botterill, 2002)	Explore the role of IT for KM in the construction industry.	IT for acquiring, developing and applying knowledge. Such as the conventional technologies and the Radical IT.
(Gottschalk, 2001)	Investigate the use of information technology to support inter-organizational knowledge management at the Norwegian law firms	IT support for inter-organizational knowledge management. IT support firm cooperation IT support of knowledge cooperation
(McMahon, Lowe, 2004)	Explore the application of KM in engineering by considering approaches to KM in light of the distinction between personalization and codification.	IT for personalization IT for codification
(Bloodgood, Salisbury, 2001)	Discuss issues that should be addresses when using information technology to implement general knowledge management strategies in support of strategic change.	IT for codify knowledge IT for create networks
(Borghoff, Pareschi, 1997)	A selection of papers from the First Conference on Practical Applications of KM	Knowledge-orientation information technology - Process management - Corporate Memories - Information Filtering
(Kankanhalli, Tanudidjaja, 2003)	Investigates the role of IT in successful KM initiatives	IT support codification approaches IT support personalization approach

### 2.3. KM and IT at the GCC countries

The Gulf Cooperation Council (GCC) countries comprise of six Arab states. These include the Kingdom of Saudi Arabia (KSA), Kingdom of Bahrain (KB), Kuwait, Qatar, United Arab Emirate (UAE), and Oman. These countries share many characteristics that united them. The common factors include a common language (Arabic), shared religious and cultural heritage, similar geographical conditions, infrastructure, and similar economics (Abdul-Gader, 1997). The GCC countries are considered as a significant world economic power. The export of crude oil from the GCC countries constitutes more than 30 percent of the total world's oil exports (Abdul-Gader, 1997). While the majority of these countries are highly dependent on the export of oil, they are trying to diversify their economies and increase the participation of the private sector in the development efforts (Al-Jasser & AlHamidy, 2003).

The Gulf countries together have comparative advantage in ICT spending variables and ICT demand as indicated by the percentage number of population accessing the internet, Internet subscribers and users of telephones and mobile telephones. According to a recent survey conducted by Madar Research, the combined regional ICT index registered 24% growth over four segment, including installed PC based, internet penetration, mobile networks and fixed land lines. This is increase the demand for a local ICT consultancy as well as Human resources services.

The GCC countries like others developing countries need to find an effective way to leverage their knowledge internally and externally, in order to survive and compete and to gain profit from the global market place of today (Hussain, Wahba, 2002). The organizations in the GCC countries realized that the knowledge transfer and knowledge sharing become a core competence of the current workforce (Storey, 2004) and their competitive edge is mostly the brainpower or intellectual capital of their employees and management (Hussain, Wahba, 2002).

For example, Bahrain has an aim of becoming the knowledge-based services hub of the GCC region. The country is focusing on implementing the most advantaged technology in all aspect of it business. Moreover, most of the public and private sectors are adapting the electronic applications as the preferred procedural method (EDB, 2004). In UAE, home of the Dubai Internet City DIC, 17% of the population use the Internet. On the other hand, organizations are committed to recruiting and developing UAE national talent. In Kuwait, in contrast, around 50% of the public and private organizations are considering KM as an important factor to their organization, as it can help them in launching a new product or services, and help their employees to increase their productivity (Almashari et al., 2002).

Despite the considerable emerge of the KM efforts in the GCC countries specifically and the much attention that has being devoted to the acquisition and dissemination of knowledge in the Arab world, this knowledge remains indefinable and is only a promising resource. There are many factors related to social culture, socio-economic, and politic issues embedded in the Arab context, that have a significant effect on the implementation of KM in the GCC countries. Fergani (2003) demonstrated that there are no rational policies to ensure that institutional values and structure supportive of a knowledge society are embedded into the political and social culture.

### **3. Research model and hypotheses**

This proposed study presents an exploratory research, which aims to investigate the relationship between IS/IT strategy and KM strategy. It focuses on the relationship between alignment and organizational performance, based on the argument that strategic fit has performance implications. The research model hypothesizes that the KM strategy and the IS/IT strategy pursued by the GCC Banking sector are associated and aligned to support the business strategy, and that this alignment is related to an improvement in the business performance. The proposed model is based on previous work on strategic alignment between IT strategy and business strategy. This work is part of a larger research study, which aims to develop a conceptual framework to investigate the co-alignment between KM strategy, IS/IT strategy and Business strategy and its implication on the organization's performance. Moreover the study will test the application of this framework within the GCC context.

Given the social and cultural differences, the authors would expect that the KM strategy and IS/IT strategy pursued by the Gulf countries to be different from those practised at the western countries. Another aim of the study is to explore the influences of factors such culture, ICT, IT infrastructure and the organizational structure in adapting KM strategy in the GCC countries. Figure (1) summarizes the proposed overall model underlying this paper.

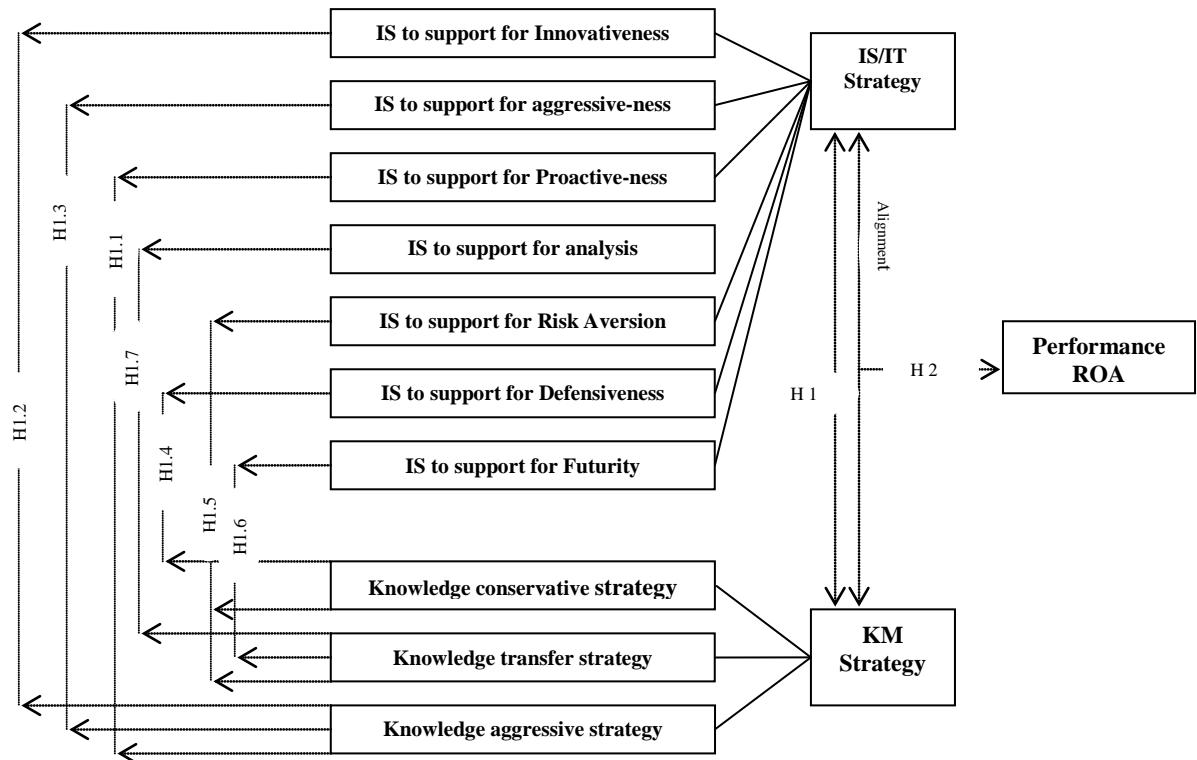


Figure (1): The proposed research conceptual model

Although many researches have been conducted on the support of IT for KM, most of them involved the support of IT as a tool in the form of hardware and software support. There has been less discussion of the strategic role of IT for KM or investigation on the relationship between the IS/IT strategy and the KM strategy in these researches. The developing and leveraging organizational knowledge is a key competency which requires strategic support of information systems as well as other supporting capabilities such as human resources and managerial leadership. An organization's focus should be on the effects of information system on KM, and, on the organizational implications of these effects (Sage, Rouse, 1999). By understanding the complexity of KM initiatives and the variety of IT solutions available on the market, the challenging task of deciding the appropriate type of IT solutions to be deployed in support of KM initiatives that will lead to a competitive advantage can be realized (Kankanhalli, Tanudidjaja, 2003). Addressing this challenge requires both IS/IT

strategy and KM strategy to be associated and aligned in order to support the business goal of the organization. Based on these premises, the following hypothesis is set:

*H1: The GCC's banking sector's IS/IT strategy is aligned with the KM strategy*

The study focuses on the realized IS/IT strategy, which is the part of the planned or intended strategy that has been achieved and pursued by the organization. The IS/IT strategy is viewed as the approach that encompasses the identification of the information needed to support the business goals of the organization and the implementation of the computer system to provide this information (Allen, 1995, cited in Wilson, 1989). In other words, IS/IT strategy is viewed as the IS/IT capabilities and the supports provided to the business strategy. Chan, et al., (1997, 1998) have put in a major effort at empirically investigating the nature of the alignment between organizational and information systems strategy. Moreover, they developed the Strategic Orientation of the portfolio of Information System (STROIS) instrument to measure realized information system strategy and to determine the ways in which information systems are used by organization to provide support for business strategy. This eight-dimensional model of realized IS strategy is designed to parallel the Strategic Orientation of Business Strategy (STROBE) instrument developed by Venktraman (1989) for measuring organizational strategy. Table (2) shows the IS/IT strategy support for business strategy according to Chan, et al's (1998) model. These dimensions of IS/IT strategy will be used in this study for validating the alignment and the association with KM strategy.

Table (2) STROIS : Dimension définition and simple indication Sources (Chan, et al., 1998)

Dimensions	Definitions
IS to Support Company Aggressiveness	IS deployments used by the business unit when pursuing aggressive marketplace action.
IS to Support Company Analysis	IS deployments used by the business unit when conducting analyses of business situations
IS to Support Company Defensiveness	IS deployments used by the business unit to improve the efficiency of company operations and strengthen market place links
IS to Support Company Futurity	IS deployments used by the business unit for planning and projection purposes
IS to Support Company Proactive-ness	IS deployments used by the business unit to expedite the introduction of products/services
IS to Support Company Risk Aversion	IS deployments used by the business unit to make business risk assessments
IS to Support Company Innovativeness	IS deployments used by the business unit to facilitate creativity and exploration

Regarding the KM strategy, three strategies have been selected among the available options which include: Knowledge Aggressive Strategy (KAS), Knowledge Transfer Strategy (KTS) and Knowledge Conservative Strategy (KCS). These strategies are well established in the KM



literatures and have been investigated and discussed in many studies (Syed-Ikhsan, Rowland, 2004; Sharkie, 2003; Bloodgood, Salisbury, 2001). Table (3) shows the definition of each strategy.

Table (3) Definitions of the selected KM strategies

<b>KM Strategy</b>	<b>Definition</b>
<b>Knowledge Aggressive Strategy (KAS)</b>	It emphasizes the innovation and creation of new knowledge (Rollo, 2002). It views knowledge as ongoing process of creative destruction (Zack, 2002) and innovation as a set of interacting knowledge process (Skyrme, 1999). It involves external, internal, tacit and explicit knowledge.
<b>Knowledge Transfer Strategy (KTS)</b>	This strategy focuses on rapidly disseminating explicit knowledge through the organization units (Bloodgood, Salisbury, 2001) and promoting the exchange of tacit knowledge through knowledge networks (Hansen, et al, 1999). It is a process aims to transfer knowledge and best practices in order to improve operational quality and efficiency (Wiig, 1997).
<b>Knowledge Conservative Strategy (KCS)</b>	Knowledge Conservative Strategy view knowledge primary as an objectified proprietary asset to be protected and financially exploited (Zack, 2002).It focuses on maintaining knowledge in its original and constructive state and keeping knowledge from unauthorized transfer to other organization. (Bloodgood, Salisbury, 2001). Moreover it relies on the effective utilization of existing assets and resources, including the existing level of knowledge (Sharkie, 2003).

The prior literatures (Gupta et al., 1997; Sabherwal & Sebherwal, 2003; Sebherwal & Chan, 2001) have identified several aspects of Miles and Snow's (1978) typology of business strategy that are related to the selected KM strategy. Moreover Sebherwal and Chan (2001) have mapped the Venkartaman's (1989) six dimensions of organization strategy or strategic orientation: Defensiveness, Proactive-ness, Risk aversion, Aggressiveness, Analysis, and Futurity onto Miles and Snow's (1997) typology of Defenders, Prospectors and Analyzers.

The mapping suggested by Sebherwal and Chan (2001) implicitly indicates that the selected KM strategies have some aspects related to Venkartaman's (1989) six dimensions of organization strategy or strategic orientation. Such as Prospectors pursue an aggressive competitive strategy pioneering products and markets (support the aggressiveness and proactive-ness) (Gupta, et al., 1997); Defenders attempt to maintain and protect their position in existing products and markets through improving operational efficiencies (support the Defensiveness) (Tan, 1997); and Analysers locate and exploit new products and market opportunities while maintaining an organization base of traditional products and customers (support the analysis and the risk aversion) (Segev, 1987).

Based on a comprehensive review of the literatures on strategic orientation (Venkartaman, 1989) and STROIS (Chan, et al, 1997, 1998), and the previous studies on the KM strategies which provided insights into the most appropriate IS/IT strategies, the following relationships between the KM and IS/IT strategies have been established as follow:

**Knowledge Aggressive strategy (KAS):**

KAS supports the organizations' proactive-ness and innovativeness in creating new knowledge which help the organisations in finding new opportunities for innovation in products, services, business process and organisational structures (Bierly, 1999; Bloodgood, Salisbury, 2001). By creating new knowledge and maximising the advantage to be obtained from future opportunities, KAS can push the organization's aggressiveness to dominate and to be the first in the market. This will enable them to build up their capabilities which can be used to protect them against future threats, competitive actions from the rivals and the changing environment (Sharkie, 2003). In general KAS can support the organization aggressiveness, proactive-ness, and innovativeness in securing their future profitability and over-extension of their resources. At the same time, KAS will sustain product and market innovation by leveraging and reducing the hazard of overtaxing knowledge and resources (Bierly, 1999; Sharkie, 2003).

**Knowledge Conservative Strategy (KCS)**

KCS is based on effective utilization and protection of existing assets and resources. It supports the organization defensiveness to achieve efficiency and reputation in certain market (Das et al., 1991) and overlooks new business opportunities that lie outside their familiar domain. KCS also permits organization with the characteristics of risk aversion to lead products and services that are difficult to imitate (Bierly, 1999), and to maintain a stable dominance of core products.

**Knowledge Transfer Strategy (KTS)**

KTS encourages value innovation that can help organization analysis to exploit new products and market opportunities while maintaining their base of traditional products and customers. This can be achieved by promoting the exchange of tacit knowledge through knowledge networks (enabling process for organization learning) (Hasen et al., 1999), and capturing or sharing best practices, lessons learned and other reusable assets in order to build the knowledge capacity. The building knowledge capacity and enabling process for organization learning can also support the organization by minimizing the risk and securing a competitive edge in the marketplace. Moreover, an organization's futurity can be supported by KTS in forecasting and evaluating the opportunities surrounding their market domain, and predicting the threats intimidate their position to attain a forward-looking and a long-term focus.

Given the above assumption on the relationship between the selected KM strategies and the six strategic orientation dimensions of Defensiveness, Proactive-ness, Innovativeness, Analysis, Futurity and Riskiness, the alignment between organization's KM strategy and its

IS/IT strategy can be considered as follow. First, when a bank pursues KAS is associated with IS/IT support for proactive-ness, aggressiveness and innovativeness. Second, when a bank pursues KTS is associated with IS/IT support for analysis, risk aversion and futurity. Finally, when IS/IT support a bank's defensiveness, risk aversion, the bank is associated with KTS.

Accordingly, the following research hypotheses were constructed:

*H1.1 in the GCC countries, IS/IT support for a bank's proactive-ness is associated with Knowledge Aggressive strategy*

*H1.2 in the GCC countries, IS/IT support for a bank's innovativeness is associated with Knowledge Aggressive Strategy*

*H1.3 in the GCC countries, IS/IT support for a bank's aggressiveness is associated with Knowledge Aggressive Strategy*

*H1.4 in the GCC countries, IS/IT support for a bank's defensiveness is associated with Knowledge Conservative Strategy*

*H1.5 in the GCC countries, IS/IT support for a bank's risk aversion is associated with Knowledge Conservative Strategy or Knowledge Transfer Strategy*

*H1.6 in the GCC countries, IS/IT support for a bank's futurity is associated with Knowledge Transfer Strategy*

*H1.7 in the GCC countries, IS/IT support for a bank's analysis is associated with Knowledge Transfer Strategy*

Furthermore, the previous literature has implicitly described the notion that the alignment between an organization's business strategy and KM helps to enhance organizational performance (Sabherwal, Sabherwal, 2003). In contrast, most of the research in the strategic alignment between IS/IT strategy and business strategy have empirically illustrated the effect of this alignment in enhancing and improving the organization performance. Hence, the alignment between the IS/IT strategy and KM strategy to support the business objectives expect to associate with a better performance. This expected relationship between alignment and the performance leads to the following hypothesis:

*H2: Alignment between KM strategy and the IS/IT strategy in the Banking industry at the GCC countries is associated with better performance*

## **4. Research Instruments**

### **4.1. KM Strategy**

In the absence of an available existing instrument to measure KM strategy, the KM strategy measure will be developed for the purpose of this study using some previous studies. These previous studies have considered the Arabic and GCC countries context in their measurement. Examples of these researches have been reported by researchers such as Syed-Ikhsan, Rowland, (2004) and Almashari et al., (2002).

### **4.2. IS/IT strategy**

In this study, only IS/IT strategy that has been realized, not one which is merely intended is measured. The Seven dimensions of the IS/IT strategy will be measured using STROIS instruments developed by Chan, et al., (1997, 1998). The STROIS questionnaires suggest that appropriate scores for IS to support Company Aggressiveness, Analysis, Defensiveness, Futurity, Proactive-ness, Risk Aversion, and Innovativeness are 3, 5, 4 or 2, 1, 3, 5, and 3 respectively on a scale of 1 to 5 (where 1 is low and 5 is high).

### **4.3. Performance**

Return on assets (ROA) is used as a measure for organization performance. It is the most frequently used measure in the strategic management literature. ROA is measured as net income divided by total assets. It has been shown that ROA relates to several other measures of financial performance and it is the best overall measure of financial performance (Dehning, Stratopoulos, 2003). ROA focuses on the overall performance of the firm.

## **5. Research methodology**

The current study is exploratory in its nature. However to achieve the objectives of this study, both quantitative and qualitative data will be required. The study will follow two research methods: survey and case study. A sample of 30 top commercial banks selected from the six GCC countries will be used in the survey. There will be 6 case studies which include the top performance commercial banks from each country. Three questionnaires will be developed. One is concerning IS/IT strategy which will be addressed to the Chief Information Officer CIO. The second and the third will concern KM strategy and the strategic alignment respectively. They will be addressed to the Chief Knowledge Officer (CKO) if available, or both the Chief Executive Officer CEO and CIO.

## **6. Conclusion**

This paper has described the initial phase of a research study on the efficient use of KM to improve the organizational performance among the banking industry in the GCC countries. It forms part of a larger research, which aims to develop a GCC-based KM strategic alignment model. The model will be used to investigate the association between KM strategy, IT strategy and Business strategy in the GCC countries. The study will consider the contextual, cultural and technological factors embedded in the GCC countries' context. Despite the considerable number of KM initiatives in the region, much attention has only been devoted to the acquisition and dissemination of knowledge in the Arab world. This knowledge remains indefinable and is only a promising resource. The current study proposes a conceptual framework to evaluate the association between KM strategy and the IS/IT strategy in supporting the business strategy in the GCC banking industry. It will investigate the effect of these associations (alignment) in the organizational performance.

## **Acknowledgement**

This study is conducted at the Centre for Enterprise Collaboration in Innovative Systems at Murdoch University. Miss Jaflah Al-Ammary is supported by a scholarship provided by the University of Bahrain.

## References:

- Abdul-Gader, A.H. (1997), "Information system strategic for multinational companies in Arab Gulf Countries", *International journal of information management*, Vol. 17, Issue 1, pp. 3-12.
- Al-Jasser, Muhammad & AlHamidy, Abdulrahman (2003), "A common currency area for the Gulf region", Bank of International Settlements (BIS) Paper, No. 17, pp. 116-132.
- Allen, David (1995), "information systems strategy formation in higher education institutions", *Information Research*, Vol. 1, Issue 1
- Almashari, M; Zairi, M. and Alathari, A. (2002), "An empirical study of the impact of Knowledge Management on organization performance", *The journal of computer information systems*, Vol. 42, Issue 5, PP. 74-72.
- Bierly, Paul E. (1999), "Development of a generic knowledge strategy typology" *Journal of Business Strategies*, Vol. 16, Issue 1, pp.1-26.
- Bloodgood, James M. & Salisbury, Wm. David (2001), Understanding the influence of organizational change strategies on information technology and KM strategies, *Decision support systems*, Vol. 31, pp. 55-69
- Borghoff, Uwe & Pareschi, Remo (1997), "Information Technology for Knowledge", *Management Journal of Universal Computer Science*, Vol. 3, Issue. 8, pp. 835-842.
- Chan, Yolande E., Huff, Sid L. & Copeland, Duncan G. (1998), Assessing realized information systems strategy, *Journal of strategic information systems*, Vol. 6, pp. 273-298
- Chan, Yolande E., Sid L. Huff, Donald W. Barclay, and Duncan G. Copeland (1997), Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment, *Information Systems Research*, Vol. 8, Issue 2, pp. 125-150.
- Das, Sidhartha R., Zahra, Shaker & Warkentin, Merrill E. (1991), Integrating the content and process of strategic MIS planning with competitive strategy, *Decision sciences*, Vol. 22, Issue 5, pp. 953
- Dehning, Bruce & Stratopoulos, Theophanis (2003), "Determinants of a sustainable competitive advantage due to an IT-enabled strategy", *Journal of Strategic Systems*, Vol. 12, pp. 7-28
- Economic Development Board (EDB) (2000), Information and communication technology, [online] <http://www.bahrainedb.com/default.asp?action=category&id=53#1>
- Egbu, Charles O. & Botterill, Katherine (2002), "Information Technologies for Knowledge Management: Their Usage and Effectiveness", *ITcon*, Vol. 7, pp. 125.

- Fergani, Nader (2003), "Second Arab human development report: the need for knowledge society", *Newsletter of the economic research forum, for Arab countries, Iran & Turkey*, Vol. 10, Issue 4.
- Gottschalk, Petter (2001), "Predictors of Information Technology Support for Inter-organizational Knowledge Management: Lessons Learned from Law Firms in Norway", *Knowledge and Process Management*, Vol. 8, Issue 3, pp. 186–194.
- Gupta, Yash P.; Karimi, Jahangir & Somers, Toni M. (1997), "Alignment of a firm's competitive strategy and information technology management sophistication: the missing link", *IEEE Transaction on Engineering Management*, Vol. 44, Issue 4.
- Hansen, Morten t.; Nohria, Nitin & Tierney, Thomas (1999), "What's your strategy for managing knowledge?", *Harvard Business Review*, Vol. 77, Issue 2, pp. 106-119.
- Hofer-Alfeis, Josef (2003), "effective integration of KM into the business starts with a top-down knowledge strategy", *Journal of Universal Computer Science*, Vol. 9, Issue 7, pp. 719-728.
- Hussain, Ahmed and Wahba, Khaled (2002), "The readiness of information and decision support center in Egypt to adopt KM", in Mehdi Khosrowpour, Issues and trends of information technology management in contemporary organization: information resources management association international conference Seattle, PP. 827-831, Idea Group Publisher IGP, USA.
- Johannessen, J.; Olaisen, J, & Olsen, B. (2000), "Mismanagement of tacit knowledge: knowledge management, the danger of information technology, and what to do about it, SKIKT", [on line], <http://www.program.forskningsradet.no/skikt/johannessen.php3>, accessed on 20th July 2004.
- Kankanhalli, Atreyi; Tanudidjaja, Fransiska, Sutanto, Juliana & Tan, Bernard (2003), "The role of IT in successful Knowledge Management initiatives", *Communications of the ACM*, Vol. 46. Issue 9, pp. 69-73.
- Lindgren, Rikard; Hardless Christian, Pessi, Kalevi & Nulden, Urban (2002), "The evolution of Knowledge Mnagement systems needs to be managed", *Journal of Knowledge Management Practice*, [on line], <http://www.tlainc.com/article34.htm>
- McMahon, Chris, Lowe, Alistair & Culley, Steve (2004), "Knowledge management in engineering design: personalization and codification", *Journal of Engineering Design*, Vol. 15, Issue 4, pp. 307-325.
- Miles, R. & Snow, C. (1978). Organizational strategy, structure, and process, McGraw-Hill, New York.
- Okunoye, Adekunle (2002), "Outsourcing as an IT management strategy for Knowledge Management in Sub-Saharan Africa", in Mehdi Khosrowpour, Issues and trends of information technology management in contemporary organization: information

- resources management association international conference Seattle, Idea Group Publisher IGP, USA.
- Sabherwal, Rajiv & Sabherwal, Sanjiv (2003), "How do knowledge announcement affect firm value? A study of firm pursuing different business strategies", Working paper.
- Sabherwal, Rajiv & Yolande, Chan (2001), "Alignment between business and IS strategies: a study of prospectors, analysers, and defenders", *Information Systems Research*, Vol. 12, Issue 1, pp.11.
- Sage, Andrew & Rouse, William (1999), Information Systems Frontiers in Knowledge Management, *Information Systems Frontiers*, Vol 1, Issue 3, pp. 205-219.
- Segev, Eli (1987), "Strategy, strategy-making, and performance in a business Game", *Strategic Management Journal*, Vol. 8, Issue 6, pp.565
- Sharkie, Rob (2003), "knowledge creation and its place in the development of sustainable competitive advantage", *Journal of KM*, Vol. 7, Issue 1, pp. 20-31
- Skyrme, D. (1999). Knowledge: the strategic imperative, Butterworth-Heinemann, Oxford.
- Story, Karen (2004), Are UAE company really managing knowledge to support UAE National integration and development, Emiratisation, <http://www.emiratisation.org>.
- Syed-Ikhsan, Syed Omar S. & Rowland, Fytton (2004), KM in a public organization: a study on the relationship between organizational element and the performance of knowledge transfer, *Journal of KM*; Vol. 8, Issue. 2, pp. 95-111.
- Tan, F.B. (1997), "Strategy Type, Information Technology And Performance: A Study Of Executive Perceptions", Proceedings Of The AIS Americas Conference, Indianapolis, Indiana, August, pp. 848-850.
- Venkatraman, N. (1989), "The Concept of Fit in Strategy Research: Toward Verbal and Statistical Correspondence," *Academy of Management Review* Vol. 14, Issue 3, pp. 423-444.
- Wiig, K. M. (1997), "KM: where did it come from and where will it go?", *Expert system with application*, Vol. 13, Issue 1, pp. 1-14.
- Willcocks, Leslie; Hindle, John; Feeny, David & Lacity, Mary (2003), "Knowledge in outsourcing - the missed business opportunity", *Knowledge Management Magazine*, [online], <http://www.kmmagazine.com>
- Zack, Michael H. (1999), "Managing codified knowledge", *Sloan management review*, Vol. 40, Issue 4, pp. 45-58.
- Zack, Michael H, (2002) "Developing a Knowledge Strategy: Epiogue" , in *The Strategic Management of Intellectual Capital and Organisational Knowledge: A Collection of Readings*, N. Bontis and C. W.Choo (eds.), Oxford University Press, March 2002, U.K.



## Appendix A

### Summary of Classifications of Knowledge and KM Strategies

Classification dimensions	Type of strategy	Reference
<b>Origin of knowledge</b>	Conservative knowledge strategy Aggressive knowledge strategy	Zack (1999, 2002) (Anncu, Ivascu, 2003)
	Knowing what you know Faster and better innovation strategy	Skyrme (1999)
	Explorer Exploiter Loner Innovator	Bierly and Chakrabarti (1996)
	<b>Knowledge domain and knowledge process</b>	Leveraging strategy Expanding strategy Appro-prating strategy Probing strategy
<b>Knowledge process</b>	Knowledge creation strategy Knowledge transfer strategy Knowledge protection strategy	Bloodgood and Salisbury (2001)
	Knowledge creation Knowledge application	(Droge, Claycomb, Germain, 2003)
	Knowledge scope Knowledge systemic competencies Knowledge governance	Abou-Zeid (2003)
	Knowledge creation strategy (knowledge asset) Knowledge transfer strategy	Syed-Ikhsan, Rowland, 2004)
	Knowledge creation and innovation (KM as an innovation strategy)	(Forcadell, Guadamillas, 2002)
<b>Process of capturing, networking and using of knowledge</b>	Codification Personalization	Jennex, Olfman and Addo (2002) Rollo (2003) Hansen; Nohria and Tierney (1999) (Kelly, 1999) (Earl, 2001), (McMahon, Lowe, Culley, 2004)
	Tacit oriented Explicit oriented	Jordan and Jones (1997)
	Pure expertise Pure procedure	Bohn (1994)
	Codification Experience accumulation	Singh and Zollo (1998)
	Explicit System strategy Tacit system strategy Explicit Human strategy Tacit human strategy	Choi and Lee (2002)
	KM Strategy support business strategy as capability KM strategy support business strategy as position in the market place	Smith and McKeen, (2003)
	<b>Different nature and strength of organization</b>	Knowledge creation strategy (Innovation and knowledge creation) Knowledge transfer strategy (Transfer knowledge and best practices) Personal asset responsibility strategy Intellectual asset management strategy Knowledge strategy as business strategy Customer focus knowledge
Developing and Transferring Best Practices Creating a new industry from embedded knowledge Shaping Corporate Strategy around knowledge Fostering and Commercialising Innovation Creating a standard by releasing proprietary knowledge		Day and Wendler, (1998)