

The Relationship between KM Strategies and IT Applications in SMEs

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Abstract

Little is known about how small and medium sized enterprises (SMEs) utilize their information technology (IT) to support their Knowledge Management (KM) strategy. Some research has been conducted in this field but from a western cultural perspective, and mainly in the large organizations context. Research on the relationships between KM strategy and IT in SMEs in developing countries, such as Saudi Arabia, is limited. The research reported in this paper addressed this relationship. KM strategy, in this research has been classified into two main strategies: aggressive KM strategy and conservative KM strategy, based on the organizations' orientation towards eight dimensions: external knowledge, internal knowledge, tacit knowledge, explicit knowledge, exploration, exploitation, broad knowledge-base and narrow knowledge-base. A total of 143 SMEs, participated in the survey. The results indicate that the proposed classifications of KM strategies were valid; the IT applications can be classified into: Internet-based IT, IT for codification and IT for collaboration; and the association between KM strategy and IT was confirmed.

1. Introduction

It is widely recognised, in the literature and practices, that knowledge management (KM) has a positive impact on organisational performance, and it is claimed to be an essential factor for organizations' competitive advantage in today's economy [1]. KM can help organisations in different ways, such as: facilitating employees learning from internal and external sources; enhancing organisational innovation, effectiveness and efficiency; facilitating new knowledge-based products and services; and/or improving the products that have additional value [2].

Information technology (IT) is considered one of the major KM enablers and facilitators. It plays a significant role in supporting KM in many different ways such as: coding and transferring best practices in organisations; creating organisational knowledge directories and databases; and creating knowledge networks. According to Alavi and Leidner [3], the role of IT in supporting KM activities and initiatives relies to some extent on the organisation's attitude towards knowledge and how

organisations strategically treat and understand their knowledge. IT support for KM refers to the availability of IT through which KM activities can be facilitated [4]. IT enables knowledge creation, sharing, storing and application among organisations [5]. Moreover, IT can facilitate communication, reuse of knowledge and creation of new knowledge by enabling conversations [6].

However, these uses are reported mainly in the context of large organisations. As the characteristics of SMEs and their problems are not the same as those of large companies, IT management methods and practices are likely to be different. It is recognised, generally, that there is a low level of investment in IT by SMEs. This is caused by a lack of financial and human resources and a lack of time and managerial expertise [7]. As noted by Bhagwat and Sharma [8], SMEs struggle with many challenges and they require effective responses and solutions. One of these responses could be to utilize IT applications to improve their competitive capabilities. According to Love and Irani [9], SMEs have to start evaluating their investment decisions in an advanced, structured and systematic way to guarantee long-term advantage. Lin et al. (1993) stated that IT can help SMEs to implement strategies by providing greater organisational efficiency.

Given the paucity of literature on how SMEs' KM strategies can influence their use of IT applications; this research aims to investigate this issue. Most of the KM research, either in large organisations or in SMEs, has been conducted and/or applied to the Western or Asian context. There is lack of research in the Middle Eastern context in general, and a significant paucity of literature on KM in SMEs in the Saudi Arabian context in particular [10, 11]. The lack of research in the Saudi context makes it difficult for SMEs to learn from previous research. Also, given the differences between the Saudi context and other contexts (Western and Asian contexts) in terms of economic, cultural and political factors, the applicability of previous research to the Saudis context needs to be investigated. Therefore, there is a need for this research from both a theoretical and practical perspectives. This research sought to empirically investigate the relationship between KM strategy and IT applications in Saudi Arabia.

The paper is structured as follows: the related literature, in terms of KM strategies and IT, is

reviewed; the research methodology is detailed; and the findings are presented and discussed.

2. Related Literature

2.1. Proposed Classification of Knowledge Management Strategies

The research reported in this paper is one component of larger research project [12, 13]. Azyabi et al [12,13] found that an organisation orientation towards knowledge sources, knowledge types, knowledge processes and knowledge-base determines their KM strategy. It was also found that no previous research had investigated KM strategic practices based on all these dimensions. Our previous research confirmed that all the above dimensions are interrelated and that these interrelationships can be used as a basis for classifying KM strategies. KM strategic orientation is therefore is classified in this research framework into: *Aggressive KM strategy*: is characterized by a strong focus on external knowledge, tacit knowledge, a broad knowledge-base and an exploration approach. *Conservative KM strategy*: is characterized by a strong focus on internal knowledge, explicit knowledge, a narrow knowledge-base and an exploitation approach. *Balanced KM strategy*: is characterized by maintaining a balanced position between these dimensions. Due to that balanced KM strategy has no specific characteristics, only the two main KM strategies are adopted in this research. Each of KM strategic dimensions is briefly discussed next.

2.1.1. Dimension of Knowledge Sources. Interactions between organisations and external environment entities such as customers, suppliers and competitors, or interactions between internal organisational entities are considered as the primary means for creating knowledge [14, 15]. Thus, the location in which knowledge exists is important. Knowledge location can determine the level of difficulty associated with obtaining/accessing the knowledge and the extent to which such knowledge is applicable for a particular organisational context. Different knowledge sources have different implications for an organisation's operations and could require different knowledge acquisition capabilities and strategies. The literature on KM and KM strategy shows that the sources from which organisations obtain knowledge are significant. Many researchers have given attention to the significance of identifying knowledge sources as a main dimension of KM strategy [16-21].

To clarify the knowledge source concept in this research, it is defined as the sources from which organisations obtain their knowledge, in line with

the definition of Zack [22]. These sources can be classified broadly into internal and external sources. Internal knowledge is the knowledge that was initially created and distributed inside an organisation's boundaries [16]. It includes an organisation's research and development [23], knowledge contained in employees' minds, or knowledge of an organisation's behaviors, procedures, software or databases [22]. On the other hand, external knowledge is knowledge that is imported from outside sources. This knowledge can be acquired in various ways: imitation, acquisition [16], hiring new employees, conducting customer surveys [24], strategic alliances, and attending presentations or seminars [25]. External knowledge may be obtained from government agencies, academic institutes, consultants, publications, software and hardware vendors and other organisations [22].

2.1.2. Dimension of Knowledge Types. The most widely cited classification for knowledge is the "tacit-explicit" classification [3, 26]. There are different knowledge classifications, such as declarative knowledge (know-about), causal knowledge (know-why), conditional knowledge (know-when), procedural knowledge (know-how), and relational knowledge (know-with) [27]. However, all of these types of knowledge can be either tacit or explicit.

The tacit-explicit classification is the highest level of knowledge classification and was discussed as a KM strategic dimension by Hansen, Nohria [28]. They proposed two strategies for KM: codification (people-to-document approach) and tacit-orientation (people-to-people approach). These two approaches/strategies have been investigated by Choi and Lee [29] under similar terms: system-oriented strategy and human-oriented strategy. With a system-oriented strategy (or codification strategy), the focus is on codifying knowledge through the heavy use of IT, and knowledge sharing occurs in a formal manner. With a human-oriented strategy (or tacit-orientation strategy), the focus is on dialogue through person-to-person contacts and social networks where knowledge sharing occurs informally.

2.1.3. Dimension of KM Processes. This dimension is concerned with an organisation's orientation towards exploration of new knowledge and exploitation of existing organisational knowledge. An exploration strategy is when the focus of an organisation is on creating new knowledge to establish a competitive position, while an exploitation strategy aims at re-using current knowledge resources in order to enhance the organisation's competitiveness and efficiency [22].

Both exploitation and exploration have some advantages and disadvantages. Focusing only on exploration is both costly and risky, while choosing only exploitation could lead organisations to fall behind their competitors [30]. Exploration strategies, according to Zack [22], are often implemented by organisations with low levels of knowledge compared to their competitors. In contrast, exploitation strategies are implemented by organisations in which their level of knowledge is higher than that of their competitors. An exploration strategy can enhance organisational innovation, but can also be associated with uncertainty and can challenge an organisation's core competency. In order for companies to operate and compete effectively, they should be aware of existing knowledge that can be exploited and the knowledge that should be explored. An organisation's ability to amalgamate existing and new knowledge is a key success factor in a competitive, knowledge-based environment [1].

Exploration and exploitation strategies have much in common with radical and incremental learning in the field of organisational learning. Radical (or explorative) learning refers to processes that change and question the basic assumptions of an organisation. Incremental (or exploitative) learning means to gradually expand the current knowledge [16]. March [30] states that there is a trade-off between radical and incremental learning; while incremental learning can work effectively and profitably in the short term, radical learning is necessary for long-term benefits. These two concepts are also known as single-loop (incremental) and double-loop (radical) learning [31]. Some organisations may focus on incremental development while others provide innovative and radical solutions for problems [32].

2.1.4. Dimension of Knowledge-Base Breadth. The knowledge-base breadth dimension is concerned with the extent to which organisational knowledge is specialised or generalized. A narrow knowledge-base can lead organisations to develop their core competencies, meanwhile, generalized knowledge may lead organisations to combine related knowledge with other organisational resources and technologies [16]. Organisations with a broad knowledge-base have team members who are knowledgeable in one particular area and have a broad knowledge-base about all product areas; however, organisations with a narrow knowledge-base have team members who are very knowledgeable about one specific area but may have limited knowledge in other areas. According to Turner, Bettis [33], in a highly competitive environment, organisations with a broad knowledge strategy could perform better than organisations with a specialised knowledge strategy. Focusing on narrow knowledge could

hinder absorption and recognition of new knowledge, and focusing on broad knowledge could lead organisations to be unable to understand and combine this knowledge effectively.

Decisions about the breadth of an organisation's knowledge-base are based on the availability of an organisation's resources. Moorthy and Polley [34] argued that limited resources force organisations to choose one particular strategy, either a broad or a narrow knowledge-base. According to Bierly and Chakrabarti [16], organisations with limited resources should focus on a specific area of knowledge (usually core competencies) to become leaders and compete based on that knowledge. Competition is another factor that influences organizations' decisions on the breadth and depth of their knowledge-base. It is necessary to have a broad knowledge-base to develop new products/services. Such development is a complex process and cannot easily be done with specific knowledge in a certain area [34]. Empirically, better performance was found positively influenced by the breadth of an organisation's knowledge-base [35]. Breadth was measured based on the diversification of technological competencies and activities of downstream-profiled research.

2.2. IT and KM

The role of IT in supporting and enabling KM activities is well recognised and reported in the literature. It is argued that the level of use and types of IT applications are influenced by KM strategic orientations. This argument is confirmed by leading authors, such as Alavi and Leidner [3], who argue that the role of IT in supporting KM activities and initiatives relies on how organisations strategically understand and manage their knowledge. Hansen, Nohria [28] suggest that "the level of IT support a company needs depends on its choice of KM strategy" (p.114). A similar argument for the influence of KM strategy on IT use was made by Russ, Jones [36] who stated that effective IT applications to support one strategy, such as exploitation, could be very ineffective for exploration and vice versa.

Based on the KM strategic approach that an organisation adopts, Bloodgood and Salisbury [17] discussed two capabilities of IT: codifying knowledge (to facilitate knowledge codification through decision support systems and expert systems) and creating knowledge (to enable communication and collaboration between experts to exchange their tacit knowledge). This differentiation between IT roles based on the organisation's KM strategic approach is followed by Kankanhalli, Tanudidjaja [37]. They discussed how IT can be used differently to support different strategic approaches. For the codification approach, IT can provide electronic knowledge repositories

through which explicit knowledge can be stored, shared and retrieved, while for the tacit-orientation approach, IT can be used to facilitate people communication and enable tacit and unstructured knowledge transfer through expertise directories and videoconferencing. The IT applications that can be used for accessing and acquiring external knowledge are different from the applications for sharing and managing internal knowledge. The applications that are needed to build a broad knowledge-base are different from applications that are required for building a specialised knowledge-base.

The conceptual framework of this research is in line with this argument: KM strategy determines the type and the level of use of IT applications. However, it is also understood that the variety of IT applications and their level of use are influenced by many internal and external factors. Chow [38] found that contextual factors (organisation size, national culture, and organisational culture) have different levels of influence on IT use for KM purposes. It can be concluded that the level of use and the types of IT applications that organisations adopt are related and influenced by their KM strategic orientation, and this relationship is reflected in this research conceptual framework.

3. Research Method

This research is quantitative-based, using a survey for data collection. The aim of the survey was to collect a wide range of observations about the KM strategic orientation among Saudi Arabian SMEs. It was important to explore whether or not there was an association between certain KM strategies and IT applications in SMEs. Another main reason for using a survey was the paucity of any previous research on the Saudi Arabian context generally and SMEs particularly. Thus collecting a wide range of opinions and practices enabled the exploration of perceptions and formed a basis on which the research constructs and dimensions were built. The types of IT/IS technologies and level of use of such technologies were unclear and

unknown; therefore, surveying SMEs helped identify these.

Given the absence of any official/governmental agency representing SMEs, there was no official directory for Saudi Arabian SMEs. Thus, we could not obtain any contact details to communicate with the targeted SMEs directly. Contact details for the SMEs were identified via the internet; these were scattered across many websites and business discussion forums such as: Saudi Company Directories; Saudi Yellow Pages; and Saudi Business Directory. The contact details found on these websites were mainly emails, SME websites and a few postal addresses. A paper-based survey was impractical as the Saudi postal service is poor and few businesses have a mailing address. In 2011, around 90% of the respondents in the survey of the Aleqtisadiah newspaper showed their dissatisfaction with the Saudi postal service [39]. This figure, as an example, highlights the quality of the postal service. Because of these practical difficulties, it was decided to use an online-based survey. Emails were sent inviting SME owners to complete the survey. This kind of survey ensured a wider reach of respondents than a paper-based survey would have.

For the KM strategies, 25 items were identified from the relevant literature [40-44]. These items had been previously used to investigate the same dimensions as was the case for this research (these items are presented in Table Two).

Fourteen IT applications were included in the survey; each was measured on a 5-point scale where 1 referred to “unknown application”, 2 to “known but not used”, 3 to “rarely used”, 4 to “regularly used” and 5 to “intensively used”. These applications were adapted from the literature on KM systems [3, 28, 29, 45] (these items are presented in Table Three).

There were 143 SMEs which responded to the survey. Based on the respondents’ demographics, it can be argued that the respondents were representative of the wider SME community in Saudi Arabia. The respondents represented a wide spectrum of different SMEs in terms of their geographic location, industry sectors, sizes, ages and annual sales, as presented in Table One.

Table 1: Characteristics of Respondents

Job title	%	Sector	%	Org. Age	%	Number of Employees	%
Owner/manager	69.0%	ICT	18.0%	< 1 year	8.0%	>20	44.0%
IT manager	12.0%	Manufacturing	12.0%	1-5 years	38.0%	21-60	32.0%
Finance manager	14.0%	Service	35.0%	6-10 years	25.0%	61-100	24.0%
Others	5.0%	Construction	16.0%	> 10 years	29.0%		
		Other	19.0%				

4. Research Findings:

4.1. KM Strategies:

This part presents and analyses the findings on KM strategies of SMEs. Table 2 summarizes the responses to the survey items on KM strategies.

Table 2: Respondents' SMEs Orientation towards KM Strategies

External knowledge sources	Mean	Std. Dev.
A large portion of our new knowledge has been developed on the basis of customers' and/or suppliers' knowledge	3.59	.99
A large portion of our new knowledge has been developed through analysis of competitors' knowledge (e.g., products or services)	3.55	.89
In terms of developing new knowledge, we prefer external consulting companies' knowledge over internal departments' knowledge	3.22	1.08
A large portion of our new knowledge has been developed through collaboration and alliance with external institutions or organisations	3.50	1.10
External Knowledge (Overall)	3.47	.808
Internal knowledge sources	Mean	Std. Dev.
Internal knowledge is an important source for creating new knowledge in our company	3.77	.75
We use our internal knowledge frequently to develop new knowledge	3.76	.82
The quantity and quality of our internal knowledge are/is superior to those of competitors	3.29	.91
Internal Knowledge (Overall)	3.61	.67
Tacit knowledge orientation	Mean	Std. Dev.
Knowledge is easily acquired from experts and co-workers in our company	3.81	.681
Informal dialogue and meetings are important methods for knowledge sharing in our company	3.88	.868
We frequently use one-to-one mentoring for knowledge acquisition	3.37	1.005
Tacit Knowledge Orientation (Overall)	3.69	.967
Explicit knowledge orientation	Mean	Std. Dev.
Knowledge can be acquired easily through formal documents and manuals	3.29	1.04
Results of our projects and meetings are documented	3.53	1.02
Knowledge is shared in codified forms like manuals or documents in our company	3.31	1.02
Explicit Knowledge Orientation (Overall)	3.38	.92
Exploration orientation	Mean	Std. Dev.
We usually experiment with radical new ideas (or ways of doing things)	3.45	1.10
A high percentage of our company sales comes from new products/services launched within the past recent years	3.17	1.05
We are usually one of the first companies in our industry to use new and breakthrough technologies	3.19	1.06
Exploration (Overall)	3.27	.91
Exploitation orientation	Mean	Std. Dev.
At our company, a strong emphasis is placed on improving efficiency	3.80	.818
Our company excels at refining existing technologies to suit our operations	3.81	.880
We frequently adjust our procedures, rules, and policies to make things work better	3.82	.861
Exploitation (Overall)	3.80	.755
Broad knowledge-base orientation	Mean	Std. Dev.
We encourage our employees and managers to have multiple skills	3.98	.736
We orientate training toward performing multiple tasks	3.75	.835
We maintain multiple-function teams	3.69	.817
Broad Knowledge-Base (Overall)	3.80	.651
Narrow knowledge-base orientation	Mean	Std. Dev.
We encourage our employees and managers to specialize in specific business areas	3.41	1.103
We invest to maintain a high level of specialized skills	3.51	.970
We offer high-value special / brand names products	3.36	1.196
Narrow Knowledge-base (Overall)	3.42	.962

The survey respondents were asked to evaluate their reliance on external knowledge on four items. Generally, they showed a high level of agreement with all the items as highlighted in Table 2. The findings show that the participating SMEs rely on some external knowledge such as the knowledge of their customers and suppliers (mean = 3.59), competitors' knowledge (mean = 3.55) and alliances with external institutions or organisations (mean=3.50), more than their reliance on consulting agencies (mean= 3.22).

In terms of internal knowledge, respondents agreed with the importance (mean= 3.77) and

usefulness (mean= 3.76) of their internal knowledge, but there was a lower level of agreement on the superiority of their knowledge in comparison to the competitors' knowledge (mean= 3.29).

In regards to tacit knowledge orientation, the ease of knowledge acquisition from co-workers and experts (mean = 3.81) and the importance of informal dialogue and meetings as significant ways of knowledge sharing (mean=3.88) were more than using one-to-one mentoring as a knowledge acquisition technique (mean 3.37). This low level of agreement could be because of the limited

number of employees that SMEs have, resulting in the lack of a formal mentoring program where new employees work with an experienced employee. On the other hand, the explicit knowledge orientation was lower than the tacit knowledge orientation. The ease of knowledge acquisition from formal documents or manuals was the lowest among explicit knowledge orientation items (mean =3.29), followed by sharing knowledge in a codified form (mean 3.31). However, the documentation of the results of their projects and meetings was the highest item (mean = 3.53).

In terms of KM process (exploitation and exploration), it was found that the overall mean of exploitation (3.80) was the highest among the other KM strategic dimensions and the mean of exploration (3.27) was the lowest. The associated difficulties and risks with the exploration process drove many SMEs to avoid it. Exploration means not only accessing new knowledge, but to what extent SMEs are able to use this knowledge within their operations and business. Making sense of new knowledge requires a broad knowledge-base including knowledge about different areas and aspects in order to understand the new knowledge and appropriate it in the new context. These findings are different from previous reported research [46-48] where SMEs are usually oriented towards exploring new knowledge and ready to enter new business domains.

Comparing the overall means of the broad knowledge-base and narrow knowledge-base reveal that the broad knowledge-base orientation was preferred and used among the respondents. The SMEs were found to strongly encourage their employees to obtain multiple skills (mean = 3.98). However fewer (mean = 3.75) orientated employee training towards performing multiple tasks. Maintaining multiple function teams, was the lowest among the three items (mean = 3.69). The items relating to narrow knowledge-base orientation were lower (mean = 3.41, 3.51, 3.36) (Table 2). As expected, SMEs tended to utilise their limited personnel and prepare them to be multi-skilled rather than being specialised in certain areas of business. It may be the case that SMEs are unable to convert their individual knowledge-base into a well-structured organisational knowledge-base or memory. The lack of such a codified organisational knowledge-base in the SMEs might affect their decisions on knowledge-base breadth.

To test the validity of the proposed categories of KM strategies, a factor analysis test was conducted, as presented in Table 3.

Table 3: Rotated Component Matrix for Factor Analysis of the KM Strategic Dimensions

	Conservative KM Strategy	Aggressive KM Strategy
Exploitation	.820	.053
Narrow Knowledge-Base	.795	.054
Internal Knowledge	.759	-.009
Explicit Knowledge	.721	-.114
External Knowledge	-.151	.798
Tacit Knowledge	-.084	.797
Exploration	.023	.773
Broad Knowledge-Base	.402	.656

The result confirmed the proposed relationships between the KM strategic dimensions and then the proposed KM strategies classification. As expected, the dimensions of the aggressive KM strategy: external knowledge, tacit knowledge, exploration and broad knowledge-base were loaded as one factor. The dimensions of the conservative KM strategy: internal knowledge, explicit knowledge, exploitation and narrow knowledge-base were loaded as another factor. This result confirms that these eight dimensions can be grouped as two main factors, which are KM strategies in this sense. This result shows the existence of the relationships between these dimensions and how the decision on one dimension can affect the other dimensions. However, it was noted that the broad knowledge-base dimension was loaded in both strategies, but with a higher score (.656) in the aggressive KM strategy than it is in the conservative KM strategy (.402).

4.2. IT Applications

Table 4 presents the findings on IT use in SMEs. It can be observed that the Internet and email were intensively used, with means of 4.40 and 4.35 respectively. Search engines and intranets were ranked as the most regularly used applications, with means of 3.99 and 3.84 respectively, followed by database management systems (mean = 3.37). The rest of the IT applications listed were found to be rarely used, with the exception of information portals, which was classified as a “known but not used” application (mean, 1.76).

Table 4: Respondents’ Responses on IT Level of Use

IT Application	Mean	Std. Deviation	Level of Use
The Internet	4.40	0.936	Intensively used
Emails	4.35	0.898	

IT Application	Mean	Std. Deviation	Level of Use
Search engines	3.99	1.028	Regularly used
Intranet	3.84	1.298	
Database management systems	3.37	1.105	
Document management systems	2.98	1.129	Rarely used
Instant messaging	2.88	1.104	
Decision support systems	2.78	1.147	
Groupware systems	2.76	1.239	
Workflow systems	2.76	1.188	
Discussion forums	2.76	0.973	
Video conferencing	2.59	0.867	
Business intelligence systems	2.22	1.176	
Information portals	1.76	0.724	Known but not used

In order to facilitate the investigation of the associations between KM strategy and IT, it was essential to categorize the IT applications included in the survey into fewer groups. Thus an exploratory factor analysis test (Table 5) was

undertaken for this purpose. However, one item (information portals) was excluded because it was classified as a “not used” application among the participating SMEs.

Table 5: Factor Analysis Test for IT Applications

IT Application	IT for Codification	Internet-Based IT	IT for Collaboration
Document management systems	.810	.124	.151
Database management systems	.795	.241	.022
Decision support systems	.739	.101	.318
Workflow systems	.619	.109	.328
Instant messaging	.471	.336	.444
Emails	.074	.882	.053
The Internet	.178	.877	.030
Search engines	.014	.766	.258
Intranet	.317	.608	.090
Video conferencing	-.022	.344	.800
Business intelligence systems	.457	-.197	.654
Groupware systems	.479	-.011	.644
Discussion forums	.368	.393	.632

Three components of IT applications were produced based on the results of the factor analysis, as presented in Table 5. These three components were named as follows: **IT for Codification**: including, document management systems, database management systems, decision support systems, workflow systems and instant messaging. These applications have the capabilities and features that assist organisations to document, manage, store and retrieve information and the details of transactions. The features of these applications enable and support the codification of business processes and knowledge. **Internet-Based IT**: including, emails, the Internet, search engines and intranet. All these applications are common

and Internet-related. These applications were ranked as the most used by the participating SMEs. **IT for Collaboration**: including, video conferencing, business intelligence systems, groupware systems and discussion forums. These applications can be considered as collaboration tools. They facilitate communication and discussion between employees to share knowledge and experiences. While business intelligence systems are not specifically designed for a collaborative purpose, they assist in analysing business trends and facilitate conversation about business concerns –in this sense they can be considered a support for collaboration.

4.3. Relationship between KM strategy and IT in SMEs

To investigate whether or not there was a relationship between KM strategies and IT

applications, a Pearson correlation test was conducted. The results of the correlation test are presented in Table 6.

Table 6: Correlation between KM Strategies and IT Applications

IT Applications	Pearson Test	Aggressive KM Strategy	Conservative KM Strategy
Internet-Based IT	Pearson Correlation	.149	.100
	Sig. (2-tailed)	.075	.237
IT for Collaboration	Pearson Correlation	.466**	.144
	Sig. (2-tailed)	.000	.086
IT for Codification	Pearson Correlation	.202*	.347**
	Sig. (2-tailed)	.015	.000

It was found that Internet-based IT applications had no significant relationship with any of the KM strategies. This was because these applications were very popular and common among most of the participating SMEs regardless of their KM strategies. However, IT for collaboration had a positive correlation (Pearson Correlation = .466) with aggressive KM strategy and no significant relationship with conservative KM strategy. Also, IT for codification had a medium positive correlation (Pearson Correlation = .347) with conservative KM strategy and a weak correlation with aggressive KM strategy (Pearson Correlation = .202). This result was because the SMEs that adopted an aggressive KM strategy focused on tacit knowledge and exploration approaches. These approaches required a high level of communication and collaboration to facilitate tacit knowledge-sharing, either within their organisations or with their partners. On the other hand, SMEs with a conservative KM strategy were explicit knowledge-focused and exploitation oriented. They required IT applications that could help in codifying and storing knowledge in an explicit form to be reused. These findings confirmed that there was a strong link between the KM strategic orientation and the type of IT applications that SMEs used.

5. Discussion and Conclusion

This research investigated the KM strategic orientation in Saudi SMEs based on eight dimensions: external knowledge, internal knowledge, tacit knowledge, explicit knowledge, exploration, exploitation, broad knowledge-base and narrow knowledge-base. These dimensions were grouped into two main KM strategies: aggressive KM strategy and conservative KM Strategy. It was found that SMEs rely on both internal and external sources of knowledge, however, the inability of having a well-developed and codified knowledge-base led to the dominance of the tacit-orientation approach. The tacit-

orientation approach was adopted much more than the explicit-orientation approach because the codification process might require financial, human and technological resources to be adopted. These requirements could be hard for SMEs to afford; thus they preferred to be more tacit-oriented. With respect to the KM processes dimension, the exploitation approach was more common than the exploration approach. SMEs may avoid taking any risk which could waste their limited resources. Although SMEs prepared and preferred their employees to be multi-skilled and able to perform different tasks within the organisations, they usually focused on one area of knowledge, generally their core competency. The focus on one area of knowledge and the lack of converting individual knowledge into organisational knowledge resulted in an inability to easily absorb new knowledge and use it in their organisational context.

This research further provided a classification for IT applications in the context of SMEs as: IT for collaboration, IT for codification and Internet-based IT applications. In regard to the overall status of IT in the Saudi SME context, it was found that Internet-based applications, such as webpages, search engines, email and intranet were the most used applications. The main reasons for this were low cost and ease of use. The findings confirm previous research which identified that SMEs tend to use low cost IT applications [49-53]. What is new with respect to this research however, are the examples of applications and classification.

Based on the classification identified through the analysis of the survey data, the relationships between KM strategy and IT applications were investigated. It was found that there were correlations between aggressive KM strategy and IT for collaboration and between conservative KM strategy and IT for codification.

IT applications were classified, based on the findings of this research into: Internet-based IT, IT for collaboration and IT for codification. SMEs

were found to be oriented towards the non-expensive and easy to use IT applications; thus Internet-based applications such as emails, intranet, and search engines were the most used applications by Saudi SMEs. IT for codification were the least used applications compared to internet-based applications and IT for collaboration.

This research contributed to the literature in the Saudi Arabian SME context which was previously

lacking in general, and in the KM aspects in particular. Although this research was conducted in the Saudi context, the findings could be applicable for similar business contexts, particularly in the countries of the Gulf Cooperation Council (i.e. Kuwait, United Arab Emirates, Qatar, Bahrain and Oman) specifically helping in policy development to better assist SMEs.

6. References

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