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Revealing the Antecedents and Benefits of KMS Use: An Exploratory Study in a Petroleum Company in Oman

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Abstract. This pilot study aimed to explore technical and social antecedents and benefits of KMS use in a petroleum company in Oman. Data was collected through questionnaire given to KMS users. From the technical perspective, results uncovered that both knowledge utilizers and contributors were concerned about the system ease of use, speed and integration. Knowledge utilizers also valued knowledge richness in terms of relevancy and timeliness. From the social perspective, both knowledge utilizers and contributors considered time/availability as the major determinant of their behaviors. The results also suggested that knowledge utilizers valued the technical factors more than the social factors, whereas, knowledge contributors valued the social factors more than the technical factors. The study also revealed that KMS use resulted not only in individual benefits, but also organizational benefits. These achieved net benefits further boost KMS use.

Keywords: KMS, Success Factors, KMS Users, Oman

1 Introduction

Knowledge involves integrating information with experience, reflection and context. For instance, knowledge can be a collection of best practices in a specific profession. Knowledge is a powerful resource that enables organizations and employees to achieve faster learning and develop better decision-making. Organizations can achieve enormous direct and indirect benefits from KMS deployment [9].

Knowledge utilization and knowledge contribution (sharing) are two major knowledge management processes. While the breadth and depth of a knowledge management system (KMS) depends on the magnitude of knowledge contributed to the system, benefits of KMS are actually recognized from utilizing knowledge from the KMS. As a socio-technical process, several social and technical factors affect knowledge sharing and utilization behaviors [15, 24].

This pilot exploratory study aimed to uncover social and technical antecedents and benefits of repository KMS use (in terms of knowledge utilization

and knowledge contribution) in a petroleum company in Oman. The need for developing countries to empower themselves through knowledge management cannot be underestimated. Several reports from the World Bank emphasized this need [26]. KMS can boost these nations' and their organizations' efforts to manage their knowledge. In Oman, KMS is still at its infancy. To achieve the potential benefits of KMS and succeed in the knowledge-based economy, organizations need to recognize the antecedents of KMS use. However, based on the published literature, there are very few studies that investigate KMS deployment in developing countries. A recent study investigated the determinants of KMS success at the organizational level and found that, based on the IT manager's perspective, knowledge culture, organizational infrastructure, technical infrastructure, management support, vision clarity and economic return affected the deployment of KMS in Omani organizations [5]. However, the study showed that IT managers do not perceive rewards policy as an effective factor for KMS success. Other studies in developing countries such as Kuwait [2] and Malaysia [8, 25] also showed that several social and technical factors lead to successful KMS deployment. However, factors affecting information system usage are best investigated at the individual users level [12, 13]. There are only a few studies that are focused on KMS users [18], and clear measurement of KMS users' satisfaction is still in its infancy [22]. Thus, this study was conducted to reveal these factors to establish an initial framework for KMS research in this area.

The next section discusses the background literature, KM processes, repository KMS, antecedents, and benefits of KMS. The literature section is followed by the research objective and questions, methodology, analysis and results, and conclusion sections, respectively.

2 Background Literature

2.1 KMS and KM Processes

KMS are a class of information systems that are developed to manage (store, search/retrieve, transfer and distribute) knowledge throughout the organization. Several types of knowledge can be managed by KMS [10]: structured internal knowledge, unstructured internal knowledge, external knowledge, and experts' profiles.

KM typically involves three main organizational processes: generation, codification and utilization [3, 10]. Knowledge generation is a process used to capture the organization's knowledge. Knowledge can be generated from many sources either internal or external. Also, knowledge can be extracted from databases, or originated by individuals or groups of individuals. Knowledge codification is the process of storing the organization's knowledge for later use. This helps organizations in establishing their "memories". Knowledge sharing constitutes knowledge codification. Knowledge utilization is the access of stored knowledge for use in daily organizational tasks and decision-making. The utilization of knowledge can create business value.

2.2 Repository KMS

Repository KMS is one of two common KMS models [3, 10]. The repository model aims to codify the organization's explicit knowledge such as best practices. The repository model is the prevalent form for KMS initiatives in organizations. IS technologies, such as relational databases and document management systems, are mostly used in the repository model. The repository KMS enables an organization to enhance its organizational memory (OM): general, explicit and articulated knowledge of the organization. Consequently, it helps in efficiently storing and reapplying workable solutions. Compared to the repository model, the network model does not aim at codifying knowledge, but instead focuses on transferring knowledge among individuals in organizations mainly through person-to-person contacts.

2.3 Antecedents of KMS usage

Based on the management and the information systems literature, KMS success depends on technical and social factors. Technical factors, here, refer to the technical characteristics of KMS, while social factors refer to organizational-cultural factors. DeLone & McLean's and Davis's frameworks are two popular classic frameworks for examining the technical success factors of an information system (IS) [11, 12]. DeLone and McLean indicated that KMS success depends on information quality and system quality. Furthermore, IS usage results in benefits. In their 2002 model, the researchers added service quality as another determinant of IS usage (see Figure 1). Jennex and Olfman and Liu offered theoretical and empirical models, respectively, for this classic IS framework in the context of KMS [17, 19]. In Jennex and Olfman's model, the technical factors that determine KMS use (specifically knowledge utilization) are information quality and system quality. Information quality is further measured by "richness" and "linkage", while system quality is measured by "level" and "form". Linkage is related to the completeness, accuracy, and currency of linkage to experts, while richness is related to the completeness, accuracy, and timeliness of knowledge. System level includes ease of search, speed of retrieval, and completeness of search function. System form refers to the degree to which information/knowledge is online and accessible through a single interface. Liu's empirical study measured users' perception about these general factors [19].

Corporate culture plays a key role in the success of KMS. Culture is "the way we do things around here" [23]. Culture values shape an organization's norms and practices, which consequently influence employees' behaviors such as knowledge utilization [14]. Several factors inhibit individuals' behaviors in terms of knowledge utilization and contribution. For instance, individuals may be reluctant to share (or contribute) their knowledge because they fear losing their value, and/or because of losing their work time to contribute knowledge. Yet, individuals may feel reluctant to use others' knowledge because of the "not invented here syndrome" [10]. This means that they do not trust using others' knowledge. Thus, there might be several social factors that motivate each of these two individual behaviors in the context of KMS. A number of dimensions of knowledge culture have been highlighted by several theoretical and qualitative studies [14]. Some of these dimensions are rewards, trust and management support (i.e., end users encouragement and providing users enough time).

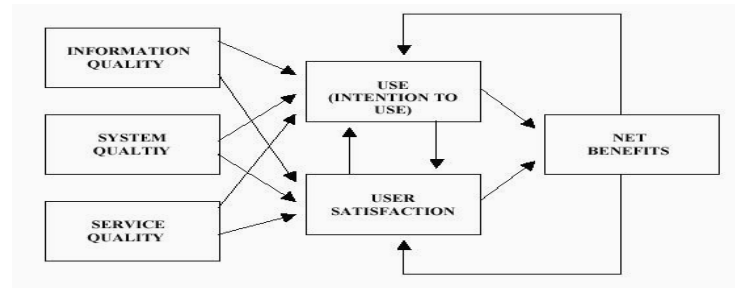


Fig. 1. DeLone & McLean IS success framework (2002)

2.4 Benefits of KMS usage

There are several benefits of KMS usage highlighted in the literature. These benefits can be classified as process outcomes and organizational outcomes [4]. The process benefits are related to communication improvement and efficiency gains. Process improvements lead to organizational benefits (financial, marketing and general).

The main benefit of knowledge utilization for individuals is individual learning [19]. Individual learning is indicated by an individual's productivity (decision making and innovation). More specifically, productivity improvement means that individuals will improve their judgments and skills, which will help them make better decisions and accomplish their work more efficiently.

There are several individual benefits that may result from knowledge contribution. Individuals may share knowledge because of motivation factors (such as achievement, responsibility, recognition, work-challenge, and operational autonomy) rather than hygiene factors (such as salary, bonuses and penalties) [16]. KMS also improves individuals' performance and productivity in terms of time and speed of the knowledge sharing process [20].

3. Research Objective & Questions

This study aimed to explore the social and technical factors that affect an individual's behavior toward knowledge contribution and utilization from repository KMS, and the benefits that result from individuals' KMS usage. Since knowledge management is a socio-technical process, antecedents of KMS use can be technical or social factors.

To explore this phenomenon, six open-ended research questions were developed. Three questions investigated knowledge utilization behavior, while the other three questions investigated knowledge contribution behavior. The questions are the following:

1. What are the technical factors that encourage or discourage you to utilize new knowledge/information from the KMS to assist you in work-related tasks?
2. What are the social factors that encourage or discourage you to utilize new knowledge/information from the KMS to assist you in work-related tasks?
 3. What are the benefits you gain from utilizing new knowledge/information from the KMS?
 4. What are the technical factors that encourage or discourage you to contribute your knowledge/information to KMS for others' use?
 5. What are the social factors that encourage or discourage you to contribute your knowledge to KMS for others' use?
 6. What are the benefits you gain from contributing knowledge/information to KMS for others' use?

4 Methodology

4.1 Participating Organization & System

This study included employees (KMS users) in a major private petroleum organization in Oman. Oil and gas is the major industry in Oman. Based on the company's website, the company delivered approximately 40.2 million cubic meters of gas per day in 2003. It had a total staff of 4,400 of whom nearly 80% were Omani (based on 2002 statistics).

The adoption of the organization's KMS was driven by business, technological and cultural trends. The organization's vision is to have any information/knowledge that a business professional needs to be accessible from anywhere, at any time, presented in the required format and with a sustained and known quality level. The system is a way to share information/knowledge within one department or across departments. For example, petroleum engineers across several oil fields can use the system to share or locate common problems' solutions. Also information/knowledge can be shared across several departments such as between the personnel and finance departments, or the drilling department and geophysicists or petroleum engineers.

Based on the IT department representatives, this investigated system is a web-centric application, with strong integration with the MS-Office suite and mail. It allows employees to store search and retrieve organizational documents, information and knowledge. The system is a purchased software package from an international organization. Any employees in the organization can voluntarily access the system from the organization's web home page. However, a limited number of employees can contribute (or store) knowledge to the system.

4.2 Participants

The study participants were the users of a specific KMS in this petroleum organization. A participant was an individual who contributed (or uploads) knowledge to the KMS for others' use, and/or an individual who used (or retrieves) the stored knowledge from the KMS for work-related tasks. The original response rate was 90, which represents KMS users who utilize knowledge or/and share knowledge. However, only 55 of this total sample represent KMS users who are authorized to contribute (store) knowledge to the system. Participants must have experience with KMS to be able to provide relevant feedback about the KMS characteristics.

Most of the participants were males; 18% were female. Around 96% were at least 26 years old. About 82% had at least two years of KMS-use experience. The majority of the participants, 74%, were Omani. About 55% of the participants were group leaders, project managers or department heads. About 49% of the participants were engineers, 17% were analysts, and 14% were consultants. Four percent of respondents had a PhD, 20% had a Masters degree, 12% had a postgraduate diploma, 50% had a Bachelors degree, and 8% had a diploma.

4.3 Research Design

Data was collected through a survey questionnaire; the questionnaire was filled in electronically (through a web-site or by filling out an electronic MS-word format copy). The study sample was initially invited through email by an official contact person (established from a prior investigation) in the human resources department at the participating organization. The selection of the sample was conducted with the cooperation of the information technology department. The study was conducted in English (the typical medium of business activities in Oman).

Along with 10 demographic questions (e.g., gender, age, degree, KMS experience, work experience, and job function), the questionnaire included six open-ended questions. The first three open-ended questions were about social and technical factors that affect knowledge utilization and benefits gained from utilizing knowledge from the KMS. These were followed by three open-ended questions about social and technical factors that affect knowledge contribution and benefits gained from contributing knowledge to the KMS. The open-ended "What" questions were applied to identify the technical and social factors that might affect KMS usage, and individual benefits that might be achieved through this usage. The advantage of including the open-ended questions is that it does not compel respondents to select from a limited list [9]. This free response may help in identifying factors that are relevant to these respondents' KMS usage. To ensure that respondents were valid participants (KMS users) for this study, the questionnaire included two questions: "Do you have the authority to utilize knowledge/information from the KMS", and "Do you have the authority to contribute knowledge/information to the KMS".

5. ANALYSIS & RESULTS

5.1 Analysis Methodology

The qualitative open-ended questions were developed and analyzed based on [9] and [21]. These researchers recommended several tools to analyze the qualitative data, including coding, and content analysis. Content analysis is a research tool that is used to make valid deductions from the research verbal data [9]. The analysis was conducted separately question-by-question. A coding scheme of the relevant factors for each question was developed based on the discussed literature above (Sections 2.3 and 2.4). New codes or categories were developed for responses that do not fit the defined coding categories. For example, the technical factors answers were categorized based on [13], [17], and [19] (see Section 2.3). The content analysis procedures for each question were conducted as follows: reviewing the transcript for each participant sentence by sentence to discover key words and phrases (inductive procedure); creating high-level factors/labels for these key words; matching these discovered factors with the coded factors from the literature (deductive procedure); and creating tables of frequencies with means. As per [21], frequency tables were developed to help draw inferences from the qualitative data.

5.2 Knowledge Utilization (KU) Results

KU Technical Factors. About 92% (83 of 90) of knowledge utilizers identified at least one technical factor. Forty one knowledge utilizers reported both knowledge and system characteristics as the technical factors that affect their knowledge utilization, 33 knowledge utilizers reported only system characteristics, while 9 knowledge utilizers reported only knowledge characteristics. *Table 1* shows that the technical factors that encourage knowledge utilization are related to system quality (frequency = 106) and knowledge quality (50). Few respondents cited service quality (5). The most cited indicators of system quality are ease-of-use (42%), speed (23%), and system integration (16%); while the most cited indicators of knowledge quality are timeliness (13%); relevance (11%) and completeness (6%). For example, one respondent said, "What encourages me to utilize the KMS is the fact that all information provided is correct and meant for our use. So, I can use it with confidence". However, another respondent said, "Incomplete and not updated database" was one of the factors that inhibited his/her usage. About system quality a respondent said "what encourages me is the easiness of the system and reliability of the KMS; what discourages me is the slowness of the system". Another respondent noted about integration: "What discourages me is the fact that there are several systems available to retrieve information".

Table 1: Knowledge Utilization Technical Factors

Technical Factors	Freq (n=83)	(%)	Technical Factors	Freq (n=83)	(%)
<i>1.1 Knowledge Quality</i>			<i>1.2 Service Quality</i>		
Knowledge/info up-to-date	11	13.25		5	6.02
Knowledge/info relevance	9	10.84	<i>1.3 System Quality</i>		
Good knowledge/info quality	6	7.23	System ease of use	35	42.17
Knowledge/info completeness	5	6.02	System speed	19	22.89
Standardized knowledge/info	4	4.82	System integration	13	15.66
Knowledge/info format	3	3.61	System reliability	8	9.64
Knowledge/info contextuality	3	3.61	Advanced search capabilities	8	9.64
Knowledge/info accuracy	3	3.61	System/knowledge accessibility	7	8.43
Knowledge/info structure	3	3.61	Good system quality/features	6	7.23
Knowledge/info overload	2	2.41	Search completeness	5	6.02
Knowledge/info availability	1	1.20	System availability	5	6.02
Total KQ	50		Total SQ	106	

KU Social Factors. About 71% (64 of 90) of knowledge utilizers identified at least social factors affect their knowledge utilization of the repository KMS. These social factors varied among respondents. Time availability is the most cited social factor (24% of respondents). A respondent said about his utilization that he was: “Discouraged to use because all the time we are fire fighting with our daily work-not given reasonable time”. The second cited factor is trust (17%) Another item related to management is awareness (9%). *Table 2* shows the social factors cited by the knowledge utilizers. One surprising finding is that some respondents (11%) reported an individual benefit (i.e., “adding value to my job”) as a social factor that encourage them to utilize knowledge from a repository KMS. An individual stated: “Adding value to my job” as a factor that encouraged knowledge utilization. Other social determinants were reported such as “resistant to change”, “does not like asking others”, and “afraid of making mistakes”.

Knowledge Utilization Benefits. Almost 84% of the respondents (75 of 90) believed that they benefited from utilizing knowledge from the repository KMS. Respondents cited several individual benefits as shown in *Table 3*. Generally, benefits can be categorized as improved self-knowledge and improved performance. Around 51% cited several benefits related to improved self-knowledge (widen own knowledge, obtain new knowledge and explore oneself). Around 76% cited several benefits related to improved performance such as (general improved performance, faster task completion, improved knowledge sharing, faster decision making, improved problem solving and reduction of mistakes). Some respondents thought the benefits were: “Minimize the chance of making mistakes”; “Improve knowledge and resolve technical problems without delay”; and “preventing you from re-inventing the wheel”.

Other benefits are related to sense of achievement. One organizational benefit reported by two respondents is “business transparency”.

Table 2: Knowledge Utilization Social Factors

Social Factors	Freq(n=64)	(%)
Availability/ no time	15	23.44
Trust/confidence	11	17.19
Adding value to my job	7	10.94
Awareness	6	9.38
Resistant to change	4	6.25
Organizational culture	4	6.25
Not like asking others	3	4.69
Interact with others	3	4.69
Mandatory use	3	4.69
Afraid of making mistake	3	4.69
Access authorization	2	3.13
Rewards	2	3.13
Training	1	1.56
Total social factors	64	

Table 3: Knowledge Utilization Benefits

Utilization Benefits	Freq(n=75)	(%)
Widen own knowledge	22	29.33
Improved performance	18	24.00
Faster work task completion/time saving	17	22.67
Obtaining good new knowledge	11	14.67
Improved knowledge sharing	8	10.67
Faster/improved decision making	8	10.67
Improved problem solving	5	6.67
Exploring oneself/ new way of thinking	5	6.67
Business transparency	2	2.67
Sense of achievement	1	1.33
Reduce job mistakes	1	1.33
Total Utilization Benefits	98	

5.3 Knowledge Sharing (Contribution) Results

KS Technical Factors. About 58% (32 of 55) of knowledge contributors reported technical factors that affect their knowledge contribution behavior to the repository KMS. Rationally, all knowledge contributors traced these factors to system characteristics. *Table 4* shows that the technical factors that encourage knowledge contribution are related to system quality (frequency = 33). Only one respondent highlighted service quality. The most cited indicators of system quality are ease-of-use (50%), speed (16%), and system integration (13%). For instance one respondent noted “One technical factor that encouraged me to contribute to the KMS is: Ease to upload and publish information...” and “Long unstructured procedures to upload knowledge are not encouraging”. Regarding the importance of system integration to the knowledge contribution, one respondent said: “There is more than one system, so not sure where to put stuff.”

Table 4: Knowledge contribution’s technical Factors

Technical Factors	Freq(n=32)	(%)
<i>SVQ</i>	<i>1</i>	
System ease of use/ user friendly	16	50
System speed	5	15.625
System integration	4	12.5
Limited storage size	2	6.25
System quality	2	6.25
System availability/accessibility	2	3.125
System effectiveness/ does not crash	1	3.125
System security	1	3.125
Total System Quality	33	

KS Social Factors. About 82% (45 of 55) of knowledge contributors reported social factors. *Table 5* indicates that the most highlighted social determinants of knowledge contribution are “availability” (have time, frequency = 24%), management support (16%), adding value to others (9%), and access authorization (9%). About the significance of “available time” to knowledge contribution, an individual noted: “Tight schedules and overloaded due to job demands!” as a negative social factor for his/her use. Only three respondents highlighted the importance of rewards policy to their knowledge contribution. Peer trust was also highlighted by four respondents. Some respondents indicated that individual benefits such as “good feelings to share knowledge” (3 respondents), and organizational benefits such as “adding values to others” (3) and improving teamwork (2) as factors that encourage them to share knowledge. Some other interesting factors that are highlighted by these respondents but were not included in this study’s theoretical model are “difficulty in converting

technical know-how knowledge to readable knowledge” (3), and “fear that others make mistakes” (1).

Table 5: Knowledge contribution’s social Factors

Social Factors	Freq(n=45)	(%)
Availability/No time	11	24.44
Management support	7	15.56
Adding value to others	4	8.89
Access authorization	4	8.89
Rewards	3	6.67
Verbal recognition by end users	3	6.67
Good feelings to share knowledge with others	3	6.67
Difficulty in converting technical expertise to readable knowledge	3	6.67
Organization’s culture	3	6.67
Professionalism/intrinsic to job	2	4.44
Mandating system use	2	4.44
Improved team work	2	4.44
Peer trust	1	2.22
Afraid others make mistakes	1	2.22
Total Social Factors	49	

KS Benefits. Eighty two percent (45 of 55) of knowledge contributors pointed out benefits from their knowledge contribution. *Table 6* shows that the cited benefits of knowledge contribution can be classified as improved sharing experience, intangible benefits and organization benefits. About 40% of participants cited benefits related to sharing experience (better sharing experience, faster knowledge sharing experience and reduce duplicates). Almost 38% cited intangible benefits such as sense of achievement and reputation. Moreover, some of these benefits are related to organizational benefits such as “improve others’ work quality” (16%) and “benefiting the organization” (7%). Surprisingly, none of the respondents cited any individual tangible benefits such as salary increment, or promotion.

Table 6: Knowledge contribution’s benefits

Contribution Benefits	Frequency(n=45)	(%)
Better sharing experience	14	31.11
Sense of achievement/good feeling	9	20.00
Reputation/respect/recognition	8	17.78
Improve others’ work quality	7	15.56
Faster knowledge sharing experience	3	6.67
Benefiting the organization	3	6.67
Reduce duplication	1	2.22
Total Contribution Benefits	45	

6. CONCLUSION

6.1 Review of Findings

Knowledge is a powerful intangible resource that enables individuals, organizations and countries to improve learning and decision-making processes and consequently achieve a competitive advantage in the knowledge-based economy. This study was conducted to uncover technical and social antecedents and benefits of repository KMS usage in a petroleum company in Oman. The study includes a somewhat diverse sample in terms of their gender, education, KMS experience, job function and nationality.

Since knowledge management is partially a social process, there might be some differences in the determinants of KMS use among users in Omani organizations compared to western users. Management values (which form the organization's culture) in eastern organizations are different than those in western organization. Unlike managers in western organizations, managers in Arabian organizations are highly structured, risk avoidant, and use mainly face-to-face communications [1]. Managers in this region avoid adopting information technologies because of low usage [7]. This study provided insights of the determinants and benefits of KMS use.

Interestingly, the study found that the determinants and benefits of KMS use in Omani organizations are relatively similar to those highlighted in the Western literature. This study revealed that 92% of respondents indicated that several technical factors affect their KMS usage. Linking to DeLone and McLean's classic model of IS success, it seems that knowledge utilizers valued several system and knowledge quality characteristics, with more concern about system characteristics than knowledge's (dimensions of system quality were cited on average 1.2 characteristics per respondent compared to 0.5 characteristic per respondent for knowledge quality). In terms of system quality, KMS users were more concerned about system ease of use (42% of respondents), system speed (23%) and system integration (16%). Based on Jennex and Olfman's classification [17], the first two characteristics were related to system level and the third is related to system form. In terms of knowledge quality, participants were more interested in knowledge richness, which is having up-to-date knowledge (13% of respondents) and relevant knowledge (11%). Service quality was rarely highlighted (by only 5 respondents). The results also showed that social factors contribute to knowledge utilization, indicated by 71% of knowledge utilizers. Availability (time), knowledge trust (confidence) and awareness were highlighted most frequently (23 %, 17%, and 9% of respondents, respectively). Interestingly, 11% of knowledge utilizers also cited an individual benefit ("adding value to my job") as a social factor that encourages their knowledge utilization. DeLone and McLean hypothesized that individual benefit may result from IS usage and further boost future IS usage. About benefits of knowledge utilization, 76% cited benefits related to improved performance, and 51% highlighted benefits related to improving self-knowledge. One organizational benefit that was cited is the business transparency.

Knowledge contributors considered the system characteristics as the major technical factors, indicated by 58% respondents. Like knowledge utilizers, knowledge

contributors are concerned about the system ease of use (50%), system speed (16%) and system integration (13%), which also fits the Jennex & Olfiman's model for KMS usage, but in terms of storage not search. However, it seems that knowledge contributors valued the social factors more than the technical factors. About 82% of respondents cited social factors while only 58% cited technical factors. Like knowledge utilizers, knowledge contributors (24%) mostly highlighted availability/time as a major social determinant of their knowledge contribution behavior. Sixteen Percent identified management support. Knowledge contributors also reported improving others' work (e.g., adding value to others (9%) and improved team work (4%)) as a social determinant of their behavior. Rewards and peer trust, which are theoretically factors in the literature, were also cited, 7% and 2%, respectively. About the benefits of contributing knowledge, 82% of knowledge contributors reported benefits. Respondents cited some improved communications such as improved sharing experience (31%) and some intangible benefits such as sense of achievement (20%) and improved reputation (18%), which are classified as motivation factors based on [16]. Knowledge contributors also cited organizational benefits such as improved others' work quality (16%) and benefiting the organization (7%) as factors that determine their contribution behavior.

In conclusion, this study generally showed that technical and social factors determine KMS usage as indicated in the western literature. Moreover, the study revealed that knowledge utilizers value the technical factors more than the social factors (92% of knowledge utilizers cited technical factors compared to 71% who cited social factors); whereas, knowledge contributors value the social factors more than the technical factors (58% of knowledge contributors cited technical factors compared to 82% who cited social factors). For the technical factors, interestingly, both knowledge utilizers and contributors considered system characteristics such as ease-of-use, speed and integration as the major system characteristics that affect their KMS use. For the social factors, both knowledge utilizers and contributors considered availability/time as the major factor for their KMS use. In addition, the achieved net benefits (individual and organizational) of KMS use further boost the knowledge utilization and contribution behaviors.

6.2 Limitations & Further Research

This study has some limitations. First, it was a pilot exploratory investigation of antecedents and benefits of KMS with qualitative data collection and analysis tools, which limits its validity and consequently generalizability. A further quantitative study should be conducted to provide rigorous statistical significance of these revealed antecedents and benefits of KMS use. Second, this study is limited only to the repository model of KMS, so future research should explore the usage of the network KMS and compare it to the repository model. Third, the study was conducted in one company and in one country with a specific KMS. Of course, this limits its generalizability. Larger empirical quantitative and qualitative investigations should be conducted to establish a general framework for KMS investigation in Oman and the Middle East area. The study should be conducted with more organizations, systems, and participants; and across several countries. A cross-cultural multivariate study

may provide insights about the significance of KMS's antecedents and benefits across several cultures.

6.3 Implications for Practice

Despite limitations noted above, this study showed some implications for KMS practitioners. Managers in this region avoid adopting information technologies because of low usage [7]. This study provided good insights of the determinants of KMS use and their benefits. First, KMS is an important IS application to improve individual and organizational learning and consequently the decision making process. Second, the study confirmed that the adoption of organizational KMS requires several social and technical factors. From the social (organizational culture) side, management support is extremely crucial to endorse a KMS initiative, clarify its objective to end users, encourage end users, and most importantly provide them the sufficient time to use it. Theoretically, time is cited as one of the inhibitors of KMS usage in terms of both knowledge utilization and contribution. This study empirically confirmed that it is really the case. Like IT managers' perceptions in Al-Busaidi and Olfman's investigation [5], this study indicated rewards policy was not highlighted as a major driver of KMS use, even though rewards has been highly cited in the literature. This could be traced to the economic situation in organizations in a developing country (as opposed to a developed country), where rewards would not be considered as a feasible policy.

Besides, the quality and credibility of knowledge stored in KMS are critical for knowledge utilization behavior. Several knowledge characteristics (i.e., relevancy and up-to-date) were highlighted technical factors, and also knowledge confidence was highlighted as a social factor. Thus, developing knowledge quality control procedures seems crucial to improve users' confidence and consequently knowledge utilization behavior. At the system technical level, KMS should be designed with an easy-to-use interface, should be fast and should be integrated as one organizational system with a single interface. This study empirically indicated that knowledge utilizers as well as contributors considered these system characteristics as motivators for their use. In addition, as indicated earlier, knowledge utilizers were concerned about the knowledge richness in terms of relevancy and timeliness.

Managers at different levels in organizations in Oman should play a major role to enhance the adoption of KMS in terms of knowledge utilization and contribution. In the Arab culture, managers are recognized as high authority [6]. Research in the Arabian context indicates that individuals perceive knowledge as power and private [2]. Thus, individuals might feel resistant to share their own knowledge with others and to utilize others' knowledge. Another study found that the decision to adopt information technologies is related to cultural aspects [7]. Similarly, this study showed that social factors are key determinants for KMS usage as well as the perceived individual and organizational benefits. Thus, managers need to continuously establish an organization's culture that promotes the exchange of knowledge, and provide end users time and incentives (not necessarily monetary) for knowledge exchange. Also, managers should constantly highlight that it is knowledge

exchange that empowers individuals and organizations in terms of productivity and learning, not knowledge harboring.

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