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An Exploratory Study on the Use of Knowledge Management System and the Employees' Perception on Organisational Knowledge Sharing and Reuse

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Abstract. Interest in adopting new digital platforms among Malaysian companies to share, collaborate, crowd source and reuse (both internally and externally) knowledge has recently been on the rise. Challenges persist, however; organisational, people and technological factors are not always easily adapted in well-planned implementation strategies [1, 2, 3]. This research studied the implementation of Practice of Knowledge Management (POKM) that is currently used in an information technology (IT) shared services company. The research findings highlighted that the technological, people and organisational factors affect differently knowledge workers at the junior, middle and senior levels. The findings also highlighted that the POKM quality is stable and organisation of the content is rated well. However, POKM has a poor response time and search capability. Hence, the content is difficult to locate, but most participants agree that knowledge in the POKM is useful for their day-to-day job, accessible anytime and anywhere. The user interface of POKM is not very easy to use, with a weak set of functions and features. And users are not very satisfied with the efficiency and effectiveness of the systems. However, employees are satisfied with the ease of access, download and reuse of knowledge. Most users agree that POKM is a new knowledge acquisition enabler. Innovative ideas and tasks can be accomplished more efficiently. Lastly, users agree that POKM enables knowledge sharing and creation.

Keywords: Knowledge sharing, knowledge reuse, perception, knowledge workers, POKM

1 Introduction

In an ever-changing economy, the advancement of technology has demanded many companies to constantly evolve themselves to be more competent global players. The number of companies that rely heavily on Internet technology to carry out their day-to-day business operations has increased in leaps and bounds. Advanced web-based systems have become an important part of organisational strategy. It is generally agreed that the key that keeps organisations always ahead of their competitors is to transform themselves into knowledge-centric organisations. Most organisations acknowledge that successful knowledge creation and sharing culture is the key asset of these organisations. The new culture of organisations today is to nurture

Community of Practice (CoP) in these organisations to make full utilisation of their knowledge. Therefore, it is important to carry out research in a case study company which has started to use a Knowledge Management System (KMS) to understand factors that cause such efforts to succeed or fail.

In this research, an information technology (IT) shared services company was chosen to participate in this project. The objectives of this project were to investigate information such as difficulties and benefits experienced by employees in the process of implementing and adapting a KMS system. This information will then be used to formulate problem statements for the subsequent phase of the research work. Based on the interviews conducted with employees of the case study company, it was found that the KMS utilisation had been drastically decreased even though tremendous effort had been invested in it. The low KMS usage had not met the objectives of the company. These objectives included increasing knowledge sharing among employees and intensifying organisational communication among employees in the company by riding on the advanced IT automated system currently being implemented. At the stage when research was carried out, each employee was given a set of Key Performance Indicators (KPI): usage of KMS for communication and knowledge sharing. This made usage of KMS a mandatory activity for the employees. This may not have been a good method to encourage usage of KMS as it might result in poor information quality. If the knowledge in the KMS is not very useful, employees will not bother to read or share it. The knowledge-related activities among employees were so poor that the amounts of collaborative communication and knowledge sharing among employees created concerns for the top management.

The objectives of this research comprised the following set of goals:

- i. To study the usage of KMS among employees.
- ii. To investigate the use of the Knowledge Based Management System (KMS) towards improving job performance through innovative ideas.
- iii. To thoroughly understand the KMS benefits, the perception of the system, motivators and barriers among employees.

Currently, the KMS system in the company does not see much knowledge sharing among employees. This project tried to understand factors that motivate employees to accept the KMS as the IT automated tool to improve their productivity rather than a system for use as an information repository only. Therefore, this research used both qualitative and quantitative approaches to collect data to provide a more comprehensive understanding of the KMS implementation in the company.

2 Literature Review

- A KMS manages knowledge and facilitates knowledge sharing among employees in companies. For companies that view knowledge as an important asset, they recognise that if KMS is used effectively, they can be benefited. Shannak [4] described components that constitute a Knowledge Management System (KMS) and highlighted how Knowledge Management System (KMS) performance could be measured.

The research works conducted by Shannak [4] and Davenport *et al.* [5] identified four categories of activities in a knowledge management project. They are: creating

knowledge repositories; improving knowledge access and transfer; enhancing a knowledge environment; and managing knowledge assets. Therefore, it is essential that a knowledge management system fulfils these criteria as stated in these four categories.

By creating knowledge repositories, the organisation can capture and store their knowledge, documents and information; hence, easy access occurs. Furthermore, if there is any turnover of employees, the knowledge captured could be useful for the new employees to effectively take on the job [6].

The second category [7] of the activity is to improve knowledge access and transfer. It is about knowledge transfer between employees within a company. This is a complicated process, as different people have different areas of knowledge. To find the perfect substitute to transfer knowledge is tedious. Therefore, in a company, it would be best to have a Community of Practice (CoP) where people with similar interest are grouped together. The ease of accessibility to the required information is very important. If the KMS contains low quality information, it will provide poor quality information to the users, which may not be very useful for their work. Therefore having good categorisation and classification of topics in a KMS is necessary.

Another area that constitutes a Knowledge Management System (KMS) is the knowledge environment. An organisation should enhance its knowledge environment if it wishes to nurture a knowledge creation and sharing environment for all its employees. A suitable environment provides the right ingredients so that employees are more innovative and willing to share their knowledge. To ensure use of KMS in a knowledge-sharing culture is a long term effort, employees must be receptive to culture sharing in a company. Senior employees need to facilitate a useful knowledge management process.

The last category which constitutes a Knowledge Management System (KMS) would be managing knowledge as an asset. Organisations should consider knowledge as an intangible asset which could be transformed into innovative ideas that could improve the company's overall performance. As most companies are moving toward a knowledge-centric organisation, proper knowledge management and use of knowledge is as important as any other organisational agendas. The companies therefore should focus their attentions on the improvement of creation, sharing and utilisation of knowledge. As knowledge management has become an agenda of the highest priority in a company, factors that could intensify the knowledge activity in companies for better profits and productivity are challenging tasks.

3 Methodology

This section presents activities that were designed as part of the research to solicit data as input to understand and answer questions of interest. Firstly, company documents were examined and studied. This was followed by a series of interview sessions. These interviews were conducted to further understand the background information and comments of the interviewees based on a set of questions given to them one week before the actual interview. These interviewees are chosen across all

the departments. Each department has at least three (3) candidates, consisting of a junior, mid rank and senior staff member. The interviews were recorded and an interview report was produced. Finally, a questionnaire survey was conducted. The design of the questionnaire was based on the data solicited from the initial document and interview outcomes. The questionnaire was prepared and a pilot test conducted on a group of selected employees. In this paper, the focus is on the outcomes of the questionnaire results after data cleaning, data consolidation, and analysis. The design of the questionnaire was based on several successful instruments as described in studies conducted by Shannak [4], Ong *et al.* [7], Lee *et al.* [8], Ali *et al.* [9], Wu *et al.* [10], Seonwoo *et al.* [11] and Brink [12].

A total of 57 employees of the case company took part in the questionnaire survey. These employees were from five departments (sales and marketing, business solutions, infrastructure service and computer operations, application development and IT process management) and of different levels of seniority in the company. The questionnaires were given out randomly to the employees. The survey was conducted to gain a better understanding of employees' perceptions towards the KMS and their satisfaction level of the system. Due to commercial and confidential reasons, the name of the company and the actual identity of the employees are not revealed.

Prior to the questionnaire survey, a short write-up and briefing on the survey's objectives were given to the employees. The objectives of this survey were to better understand the existing KMS and to find out possible improvements of the current KMS system from various aspects such as functionality and social network capabilities from systems such as Yammer or Facebook. In this exercise, employees were required to fill in general information such as job type and position level. No names were required as the survey was done anonymously so that confidentiality was kept.

The questionnaire was divided into four parts and consisted of a total of 102 questions. The first part consisted of four questions and they were simple dichotomy questions. These questions asked about employees' perceptions of the existing KMS as well as their main usage of the system. Questions asked also included the purpose of using KMS, the type of user that they grouped themselves into and the people they interacted with most through KMS. The next part of the questionnaire survey attempted to ask the employees to rate themselves. Responses for each question were rated from strongly agree (given a value of one) to strongly disagree (given a value of five). This set of questions examined different aspects of the KMS such as the KMS quality, KMS content quality, KMS interface, KMS functions, KMS user satisfaction, perceived KMS benefits, KMS system use, trust, KMS security, organisational issues, extrinsic and intrinsic reward that might affect employees' use of the system. This provided a better understanding of the employees' perception towards the existing KMS system.

In the design of the questionnaire instrument for this research, a set of questions was designed to investigate the future improvements of the KMS. A total of 13 questions were designed to collect responses from the employees. All these questions were used to collect opinions on the features of enhancement of the current KMS system. In this exercise, the evidence of the interview content was validated, to indicate whether employees had a strong desire to adopt social media systems as a replacement to the current system. Lastly, the survey looked at how the employees

rated the overall KMS technology in terms of functionalities, flexibility, convenience and reliability. These questions enabled the employees to express their opinions by rating various aspects of KMS as very excellent, excellent, fair, poor or very poor. In short, the design of the questionnaire basically covered all the issues to validate the employees' interview responses.

4 Empirical Analysis

In this section, the findings from the questionnaire survey are thoroughly analysed. The responses from the employees were collected and analysed to understand the employees' perceptions of the KMS, willingness to share knowledge, readiness to adopt an enterprise microblogging system. Based on the questionnaire survey, responses from 37 out of the 57 employees in the company were collected. The response rate was 65%. The process of collecting responses from the participants was quite time consuming due to their busy work schedule.

Figure 1 shows the types of KMS users in the company. From the 37 respondents, 32 of them use the KMS in their work. Five respondents do not utilise the KMS at all. It was clear that some employees' jobs do not require them to use KMS at all. From responses collected, 54% of the respondents are moderate users, 24% are light users and 8% are heavy users. The responses compiled found that employees in the IT shared services company are made up of a large population of 'moderate' knowledge users. The low percentage of 'heavy' knowledge user type has raised the concern of the management, considering this is a knowledge-driven organisation where knowledge is created, used, exchanged and shared on a daily basis. Based on Figure 1, it can be seen that 86% of the employees make use of the KMS to a certain level or extent.

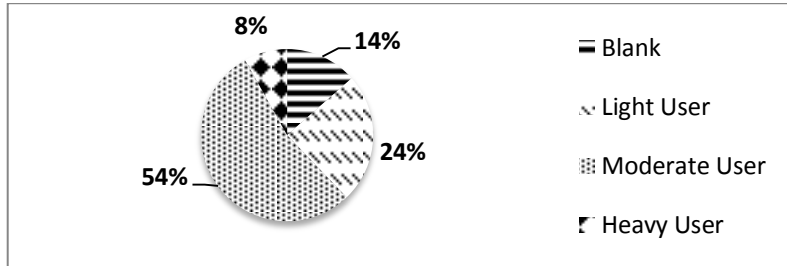


Fig. 1: KMS user types

The KMS quality outcomes shown in Figure 2 indicate another area that provides insight on how employees perceive the system. In terms of KMS quality, a number of questions were asked and analysed. As the chart shows, most of the respondents chose 'Agree' to all the quality related questions. The numbers of positive responses are more than the negative responses. Therefore, it can be deemed that the quality of the KMS is quite good. However, the negative responses from some of the respondents that chose 'disagree' or 'strongly disagree' on the quality of the KMS should not be neglected and these indicate a need for improvement. KMS quality can be a rather serious factor that affects adoption and trust toward the use and confidence in the system. More careful and detailed study may be helpful in this respect.

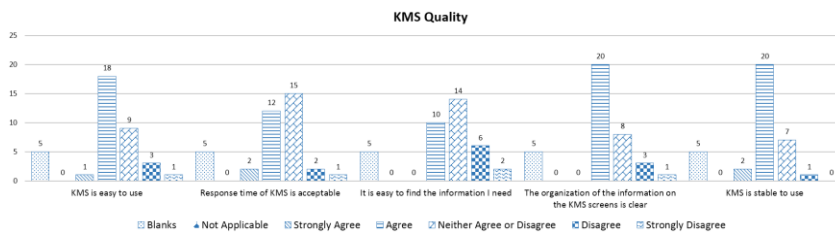


Fig. 2: KMS quality

Another area of interest is the KMS content quality where most of these respondents agree that the KMS content is useful to them. They agree that the KMS is important and helpful to their work; the system is accessible anytime and anyplace as well as the recommended solutions in the KMS being useful. In term of searching capabilities, the KMS is still lacking. In Figure 3, respondents clearly indicate that on average they agree that the KMS is quite easy to use. A total of 11 respondents chose 'agree'. The numbers of respondents who chose 'disagree' and 'strongly disagree' are much higher compared to other responses. Hence, it is believed that the KMS search and retrieve capabilities still need further improvements.

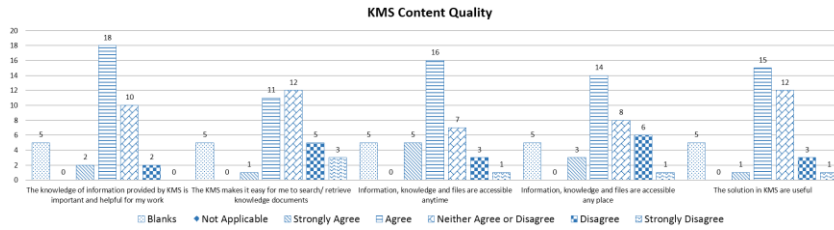


Fig. 3: The KMS content quality

Figure 4 tabulates the responses about the design of the KMS interface. Only a small number of respondents disagree and strongly disagree on the user-friendliness of the system interface. This shows that the system is quite user-friendly. The responses of the question on the functions and capabilities from the respondents are examined and analyzed. The responses show that there is still room for improvement in the KMS. The KMS can incorporate more and better functions and capabilities that suit user needs. Hence, the interface is a potential research area that the researcher can work on.

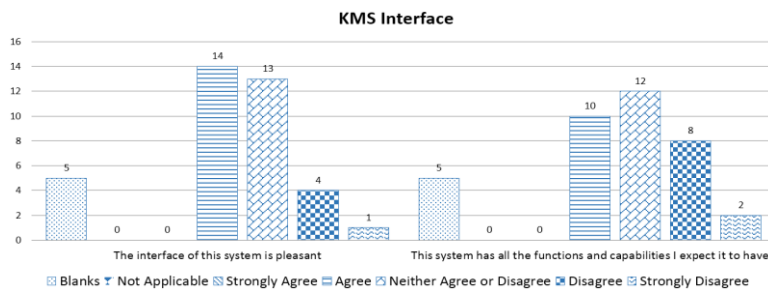


Fig. 4: The KMS Interface

In Figure 5, the KMS functions are generally acceptable to the respondents in terms of their usage for knowledge networking, knowledge sharing and knowledge creation. All three questions in this area received positive feedback, as most of the respondents rated 'agree' as their answers. Based on the analysis, it is shown that the respondents have not fully utilised all the KMS functions as they should.

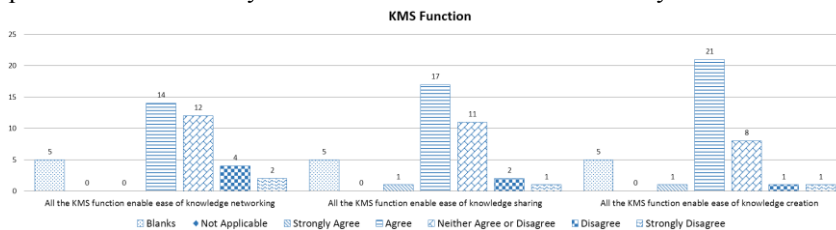


Fig. 5: The KMS functions

In term of user satisfaction, Figure 6 shows the satisfaction level of KMS users in terms of KMS efficiency, effectiveness, ease of access, ease of download and knowledge reuse. The figure shows the majorities are satisfied with ease of access, ease of download and knowledge reuse, whereas for KMS efficiency and effectiveness, the majority of the respondents tend to remain neutral or 'blank'. This message shows that the efficiency and effectiveness of the KMS may need some detailed study. Choosing 'blank' or ignore this question could have multiple hidden messages from the users.

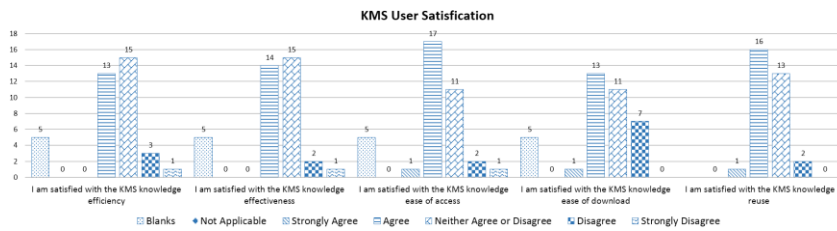


Fig. 6: User satisfaction towards the KMS

Figure 7 shows perceived KMS benefits. This area examines what the user benefited from the KMS's perspectives. Responses of the three questions were analysed. The first question attempted to find out how KMS helped the users in acquiring new knowledge and innovative ideas. The second question asked about how the KMS helped users effectively manage and store knowledge and the last question examined how the KMS helped users to accomplish tasks more efficiently. Based on the respondents' answers, the majority of the respondents agreed that the KMS helped them, with 17 respondents agreeing to the first question, 19 respondents to the second and 15 respondents to the third question. Across these three questions, it shows that most users use KMS to manage and store their knowledge.

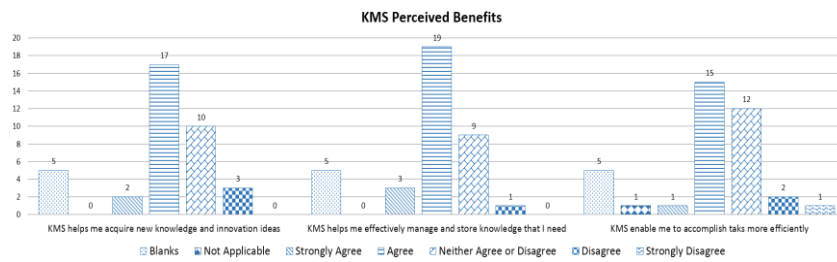


Fig. 7: Perceived KMS benefits

The uses of the KMS according to responses from employees are depicted in Figure 8. The questions on how the users actually used KMS to make decisions, record knowledge, communicate knowledge and information with colleagues, share general knowledge or sharing specific knowledge were asked. The figure shows that a very large majority of the participants chose 'agree' to all of the questions except for the question on the use of KMS to make decisions. Therefore, most users use the

KMS to record and maintain their knowledge, communicate knowledge and information with colleagues, sharing general and specific knowledge.

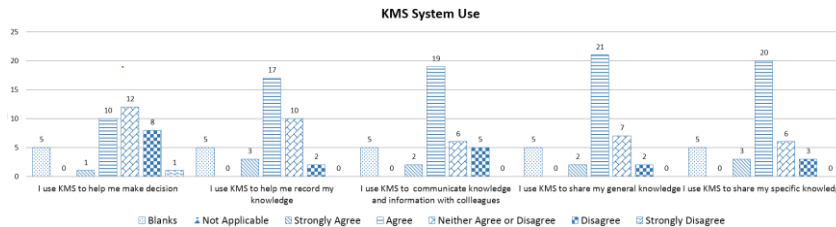


Fig. 8: System use by the respondents

Another question in the survey was about future improvement of the KMS, which required the respondents to comment and provide data on the kind of improvements that could be introduced to the KMS. Based on these responses, future improvements and a potential new system may be introduced to the current system and the company respectively. Figure 9 shows that 22 respondents ‘agree’ that having more people actively involved to contribute knowledge on the KMS would be more fun. Most respondents agree that the system should provide more and better functions. Most respondents choose a ‘watch-and-see’ attitude before making a comment. Due to lack of exposure and experience on the new platforms, these respondents expressed that only if they had tried the new platforms would they want to respond to these questions. Therefore, most of them chose to remain neutral.

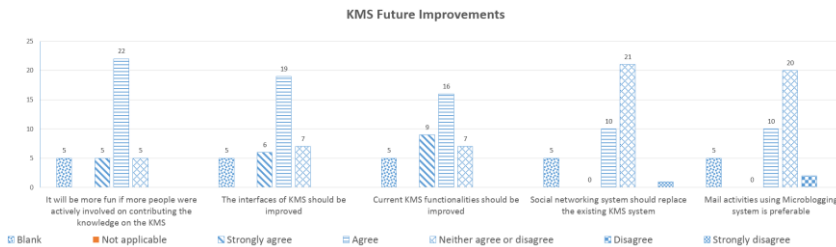


Fig. 9: KMS future improvements

The quantitative approach provides a quick and precise reflection on how employees’ respond toward questions asked in the survey exercise. In the survey, respondents also provided some comment on their perceptions of the KMS. Some of the comments that the researcher should take into consideration, summarised as follows, are:

- Poor organisation of the information in the system.
- Inability to offer search features like Google or Bing.
- Need to spend more time to know more about the KMS.
- Depositing articles into the KMS in order to fulfil the monthly quota as part of their KPI has resulted in poor content quality and deviation from knowledge sharing objective set by the company.

These four issues raised by the respondents should be taken into consideration seriously so that the KMS can be improved. In terms of organisation of knowledge and search features, there is still much room for improvements. However, the last issue above, about knowledge material deposited into KMS in order to fulfil the monthly quotas, is certainly a critical issue. The Community of Practice (CoP) in the company with respect to useful knowledge sharing practice is rather poor and weak. This is indicated by the fourth point in the remarks compiled from the participants, where the knowledge sharing being practiced among knowledge workers is driven by the quota set by the company. Hence, the objectives of the knowledge sharing has been deviated; as such, the desire for knowledge sharing practice outcome is poor. This shows that the KMS has not been properly used and the culture of knowledge sharing is still poor. Therefore, it is crucial that the employees change their mind-set to actually make use of the KMS for the purpose of knowledge sharing instead of just merely depositing articles that are not very relevant.

5 Research Findings: Analysis and Discussion

One of the objectives of this research is to study the perception of the usage of the KMS in the case study company towards improving the company's productivity and discovering new innovation from knowledge in the KMS. Currently the system usage is poor. The system is merely used as a referencing system on policy, transactional documents, procedures and other 'new' knowledge articles. As described in Nonaka [13], Aranda-Corral et al. [6], Parameswaran et al. [14, 15], knowledge activities in a full knowledge conversion model such as socialisation, externalisation and combination are essential in a company. The information within the system is now very messy. Searching for specific information is difficult and tedious as employees dump information into the system in order to fulfil their monthly quota currently.

Therefore, through this study, the problems with respect to the existing KMS system are identified. By identifying these problems, the employees and the company are able to plan areas that need to be improved. In order to improve the company's productivity and to discover knowledge for innovation, the quality of the information shared within the KMS needs to be increased and these issues need to be properly managed.

Another objective of this research was to study the current KMS and the employees' perceptions towards the KMS. Based on the survey conducted, the findings were documented. In order to have better understanding of the current KMS performance, the Categorization Matrix of Performance Indicators discussed by Shannak [4] was used as the basis for the KMS analysis. For this study, not all the indicators were used. The research instrument examined a set of relevant indicators in this phase. The measurement from the matrix were handled in two ways, through the log in the database and by conducting surveys. However, in this research, only the survey instrument was used, therefore the indicators which required logging into the database as the source was not used. For the survey measurement, the results were gathered from findings in the form of charts from the preliminary questionnaire survey. Table 1 shows the proposed Categorization Matrix of Performance Indicators,

separated into three major focus areas – process, human, and IT - where each area has its own domains and performance indicators. Firstly, in the process focus area, one of the domains is on the quality of knowledge. The performance indicators focus on the extent the employees consider the knowledge in the KMS useful and reusable. This can be seen in the KMS content quality (Figure 2) which shows that a high number of users agree that knowledge information provided by KMS is important and helpful to their work and most of them also agree that finding solutions using KMS is useful. Another performance indicator to be examined is the aspect of work efficiency due to new routines.

Focus Area	Domain	Performance Indicator	Source
Process	Quality of Knowledge	<ul style="list-style-type: none"> To what extent the employees: <ul style="list-style-type: none"> consider knowledge in databases useful re-use knowledge Number of returning users in databases 	<ul style="list-style-type: none"> Survey Log in database
	Efficiency due to new routines	<ul style="list-style-type: none"> Number of: <ul style="list-style-type: none"> calls to support function hours spent with external experts, per month employees participating in this survey To what extent the employee: <ul style="list-style-type: none"> experience saved time in finding the correct information/competence due to using the databases consider increased number of orders connected to solutions/success stories 	<ul style="list-style-type: none"> Survey Log in database
	Incentives	<ul style="list-style-type: none"> Number of distributed incentives 	<ul style="list-style-type: none"> Manager
	Knowledge Contributor	<ul style="list-style-type: none"> Occupational title of the Contributor Business Unit, where the Contributor is working 	<ul style="list-style-type: none"> Log in database
Human	Knowledge Sharing Attitude	<ul style="list-style-type: none"> To what extent employees feel: <ul style="list-style-type: none"> comfortable reusing solutions/contributions comfortable sharing their knowledge in order to help others that they save time by using knowledge databases in their daily work 	<ul style="list-style-type: none"> Survey
	Knowledge Sharing Activities	<ul style="list-style-type: none"> Number of hours the employees participate in workshops/seminars/networks or other activities, per month 	<ul style="list-style-type: none"> Survey
	Use of Participation in Activities	<ul style="list-style-type: none"> To what extent employees consider that participation in activities generates: <ul style="list-style-type: none"> new relations/contacts experience and more contributions in databases 	<ul style="list-style-type: none"> Survey
	Awareness	<ul style="list-style-type: none"> To what extent the employees feel they have been provided with sufficient: <ul style="list-style-type: none"> information/education for: <ul style="list-style-type: none"> the new routines and work procedures the new databases 	<ul style="list-style-type: none"> Survey
IT	Active Involvement	<ul style="list-style-type: none"> Number of users Number of: <ul style="list-style-type: none"> accesses in chosen area, per user returning users in databases solutions contributed, per user success stories contributed, per user lessons learned contributed, per user best practices contributed, per user other contributions, per user Number of employees who have registered as a member 	<ul style="list-style-type: none"> Log in database Survey
	Knowledge Structure	<ul style="list-style-type: none"> Number of communities in databases Number of topics in communities in databases Number of taxonomies in databases 	<ul style="list-style-type: none"> Log in database
	Usability	<ul style="list-style-type: none"> To what extent the employees consider: <ul style="list-style-type: none"> the databases to be user friendly help-instructions in the databases being sufficient it easy finding colleagues with the correct competence 	<ul style="list-style-type: none"> Survey

Table 1: Proposed Categorisation Matrix of Performance Indicator [4]

This is viewed from the extent to which employees experience time saving when finding correct information in the KMS. Our findings show that the current KMS still has issues in helping users to find the correct information in a short span of time.

The human factor was another key performance indicator examined in this research. From the survey results, the KMS user satisfaction (Figure 6) among employees was high. Findings also indicated that most employees agreed that the knowledge in the KMS was reusable and they mostly had no issue in sharing knowledge. In the perceived KMS benefits in Figure 7, it shows that a high number of respondents agreed that the current KMS helped them to efficiently manage and store knowledge and also helped them to accomplish tasks more efficiently. In the analysis on the KMS system use, it shows that most employees used the KMS to record knowledge, communicate knowledge and information with colleagues, share general knowledge and share specific knowledge. However, in terms of decision-making, not many respondents had used the KMS for this purpose.

From the analysis, it shows that most of the respondents make use of the KMS. This shows that the employees of the company are quite actively involved in using the KMS. The last part of this study was on the usability of the KMS; that is, how user-friendly the KMS is. Based on the KMS interface responses shown in Figure 4, 14 out of the 37 respondents thought that the interface was pleasant whereas 13 remained neutral. This showed that there is still room for improvement for the interface of the KMS.

In conclusion, based on the analysis and findings from the survey, the results show that the current KMS's overall performance indicators are still high when compared to the three areas specified in the categorisation matrix. The KMS still fulfils most of the criteria. However, based on the staff perceptions towards the KMS, improvement still needs to be made, especially in the search function to allow better search capabilities and also in the system interface. In addition, the quality of information shared also needs to be improved so that it could help co-workers. Motivation from upper management and commitment of employees is needed to ensure information and knowledge shared is used and useful.

6 Organisational Knowledge Sharing and Education

The use of KMS in education has helped teaching professionals to reap benefits such as sharing of richer resources, appreciating teaching experiences and cross-learning of good practice. This allows improvements in teaching techniques and the quality of teaching delivery. However, findings presented by Petrides *et al.* [16] and Sohail *et al.* [17] also highlight that the journey of knowledge sharing in education comes with challenges too. From the perspective of organisational knowledge sharing, lessons learned and problem solving techniques exchanged and shared among knowledge workers help to educate and improve the quality and productivity of work delivered by knowledge workers. By being able to identify motivators, barriers and better understanding of the perception of KMS, knowledge sharing is an enabler that can educate employees to improve their delivery in organisations.

7 Conclusions and Future Research Plan

In conclusion, Knowledge Management Systems (KMS) are useful for retaining tacit and explicit knowledge which are hidden within employees. KMSs are able to store, access and share among co-workers within companies. However, if a KMS is not being fully utilised, it would defeat its purpose and end up being a waste of company resource. Thus, motivation from the top management, and dedication and commitment from the employees are essential to ensure the on-going use of the system. For future research, the plan is to enlarge the research scope by considering a comparison of the characteristics (unit and organisational level) of the intended subjects and the respondents as well as increase the number of participating companies so that data collected will not be too thin.

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