An Empirical Study of Knowledge Management System Implementation in Public Higher Learning Institution

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ABSTRACT

Without any doubt, Knowledge Management (KM) does offer the way on how to exploit intellectual capitals in business organizations. However, the KM principles can also be implemented in other types of organization such as the Higher Learning Institutions (HLI). One way to exploit KM is by implementing the KM System (KMS). As we all concern, knowledge is everywhere and how far it has been captured, collaborated and managed systematically especially in public higher learning institutions is unknown. Further more, how far KMS have been giving benefits to the students in PHLI is something that never been revealed. Besides that, the general framework of KMS, even though accepted but there are some unidentified features that has not been discovered. By adding these unidentified features, it will make the existing framework of KMS more effective. This study is mainly aimed to achieve three main objectives. First is to analyze respondents' perception of current KMS implementation in PHLI in Klang Valley, second is to analyze the current state acceptance and implementation of KMS framework in PHLI in Klang Valley, and third is to provide suggestions for what should be included in a general KMS framework for PHLI. These people consist of academic staffs, non-academic staffs and students. Meanwhile, the works involve teaching and learning, research and development (RnD), and services. This study applied the survey method, where questionnaires were distributed to six PHLIs in Klang Valley and later were analyzed using statistical analysis. Most of respondents perceived KMS as a new way to add value. The results indicated that the current state of KMS framework implementation in PHLI has been accepted. However, the finding also discovered the lacking of awareness to the current KMS implementation. This causes some of the applications, technological systems and audit, which are used in KMS, were not fully utilized and realized by the users. The modification on the existing KMS framework emphasizes more on KMS awareness and its roles. The finding has also shows that the incentives and rewards do play significant roles in KMS implementation.

1. Introduction

In today's competitive business environment, many organizations are struggling to meet or keep up with the demands of their clients, competitors, investors and regulators. Managers all over the worlds are realizing that knowledge in the form of expertise and competence is the organization's most important assets and its quality and availability can help them to face this situation. This phenomenon leads to introducing a new business philosophy, namely KM which directs decision on where, how, when to create, accumulate, update and account for knowledge [26]. More organizations realize the need to care about intellectual capital. The intellectual capitals become the strategic resource of the organization that plays a key role in getting competitive advantages. KM offers a way on how to exploit intellectual capital. However the principle of KM can also be used in other organizations, such as HLI. HLI is recognized to be in knowledge business since they involve in the knowledge creation and dissemination, and learning, and increasingly they are exposed to marketplace pressure in similar way to other businesses [20]. It is reasonable to presume that KM has something to offer to HLI. In HLI running businesses (Teaching and Learning, Research and Development, and Services), a collective of people will involve, these people can be categorized into three groups, which are academic staffs (e.g.: lecturers and tutors), non- academic staffs (e.g.: administrators and technicians), and students. These groups of people with different background, expertise, and experience will perform teamwork. Teamwork refers to the cooperation and collaboration between the team members. The interaction among of these people in order to complete their task creates a new environment, namely "Collaborative Environment". Collaboration can provide the framework for bringing the teamwork to successful conduct of business [22], [23]. One way to make this mission become reality is by developing and implementing KMS in HLI. KMS is defined as a distributed system for managing knowledge in organization, supporting creation, capture, storage and dissemination of expertise and knowledge with goal to get the right information from the right people to the right people at the right time [28].

KMS plays an important role as a medium to connect the people and the teams in collaborative environment. In order to implement the KMS, a KMS framework is needed which includes a KMS Architecture, KMS Application and Functionality, KMS Process, KMS Socio-culture, KMS Psychological and KMS Audit that are combined together and become a structure for KMS framework. Since there have been limited studies on investigating the current state of KMS in Learning Institutions especially in Malaysian situation, this study has grabbed this opportunity to investigate the current acceptance state of KMS

development and implementation for collaborative purpose in Malaysia HLI context, specifically the PHLI. This study has examined the involvement of academic staffs, non-academic staffs and students in the three main PHLI areas, which are teaching and learning, research and development, and services.

With the explosive growth of interests in KM, many different KM and KMS frameworks have been produced. However, only a few of these frameworks have reached prominence and a broad audience [19]. This situation is described by Rubenstein-Montano et al., (2001), as generally accepted frameworks for KMS have not been established [21]. The main problem has been identified, which is the approaches used in KMS frameworks do not adequately fulfill the KMS needs of organization. There are two possible reasons leading to the main problem [21]. The frameworks are not consistent with systems thinking, and also the frameworks are prescriptive in nature and thus center on KM tasks and the frameworks do not address the nation of double-looping learning. Besides that, there are lacks of cohesiveness across frameworks as well as there is no single definition of what constitutes a KM framework. There are many concepts that are common to multiple frameworks, but the ordering or structure of frameworks varies. Therefore, the research was conducted to meet the highlighted objectives.

2. Related Research

Knowledge is what is known, it is used to mean the confident understanding of a subject, potentially with the ability to use it for a specific purpose [28]. There is no single definition of knowledge on which scholars agree, but rather numerous theories and continued debate about the nature of knowledge. It causes different authors come up with different definitions of knowledge. There are two types of knowledge, which are explicit knowledge and tacit knowledge. Civi (2000) stated that explicit knowledge can be expressed in words and numbers and shared in the form of data, scientific formula, specification and manuals [2]. It has codified and stored in database where it can be accessed and used easily by anyone in the institution. While, tacit knowledge is knowledge that sometime not easily visible and expressible. It is highly personal and hard to formalize, making it difficult to communicate or share it with others. There are two dimension of tacit knowledge. The first is technical dimension (encompasses the kind of informal personal skills or crafts often referred to as "know-how"). The second is the cognitive dimension that consists of belief, ideas, values, schema and mental models [2]. The interaction between the explicit knowledge and tacit knowledge is not totally different. This interaction is known as knowledge conversion. From the interaction that

has been defined, Nonaka and Takeuchi (1995) came up with four modes of knowledge conversion [17]. They include:

i. *Tacit knowledge to tacit knowledge (socialization):* It is a process of sharing experiences, which creates tacit knowledge. E.g.: shared mental models and technical skills. It is done trough observation, imitation and practices.

ii. *Tacit knowledge to explicit knowledge (Externalization):* It is a knowledge creation process in that tacit knowledge becomes explicit knowledge. E.g.: concepts and hypotheses or models.

iii. *Explicit knowledge to explicit knowledge (Combination):* It involves combining different bodies of explicit knowledge

iv. *Explicit knowledge to tacit knowledge (Internalization):* It is a process of embodying explicit knowledge into tacit knowledge and is closely related to "learning by doing".

2.1 The Concept of KM

The definitions of KM may vary from organization to organization. In general definition, KM is encompassing any processes and practices concerned with the creation, acquisition, capture, sharing and use of knowledge, skills and expertise. From the several definitions above, it can be concluded that KM is the discipline that helps spread knowledge of individuals or groups across organizations in ways that directly affect performance. KM envisions getting the right information within the right context, person, and time for the right business purposes. Spreading knowledge of individual or groups is basically the KM activity that involves generation, codifications and transfer [5]

i. Knowledge Generation - Refers to activities related with the creation of knowledge either internally or externally. Organizational knowledge may be generated by acquisition, fusion, and adaptation; or by the dedication of resources for a completely new development. The key issue is the intentional generation of knowledge.

ii. Knowledge Codification and Coordination - Refers to the steps required to put organizational knowledge into a form that makes it accessible to others who may need it. The objective is not only to have the knowledge codified but also organized, easy to understand and share.

iii. Knowledge Transfer - Knowledge transfer is described as happening in direct interaction between and among people as well as in the interaction with knowledge repositories such as databases, knowledge bases, documents, lessons learned, documents of best known practices, manuals, and procedures either in

digital form or in hard copies. The people called as "knowledge workers" create these "repositories".

2.2 KM Process and Component

The main important character of KM is KM Process. KM Process is the core function in KM activity. Various attempts have been made to provide a categorization for KM processes. For example, DeLong (1997) classified the processes into capturing, transferring and using knowledge [6]. Leonard-Barton (1995) on other hand, distinguished between acquisition, collaboration, integration and experiment [13]. Grant (1996) indicated the effectiveness KM process should be conducted frequently, consistently and flexibly [8]. Each KM process has its own advantages in each implementation. The KM process includes:

i.   Knowledge Creation/ Acquisition - It is as a knowledge construction. In this stage the most important task is to identify which knowledge is relevant or essential to the company or institution [15].

ii. Knowledge Organization/Storage - Involves gathering a massive number of knowledge into knowledge asset or database without a well-designed knowledge organization.

iii. Knowledge Distribution - Knowledge distribution is the retrieval and dissemination of the knowledge to use in another learning experience. It includes "pushing" knowledge to its users and users "pulling" the knowledge they need. (Cross & Isrealit, 2000) and (Garvin, 1993).

iv. Knowledge Application - It is the process of using and applying the knowledge in order to accomplish task and mission.

The important components of KM are people, content, culture, process, and technology [18] People are the ones to produce, use and share knowledge. Culture of sharing is crucial to the success of KM and Internet based learning. Process and technology are integral parts of KM.

2.3 Proposed KM Framework

The framework can be classified as either prescriptive, descriptive or a combination of the two. Prescriptive frameworks provide direction on the types of KM procedures without providing specific details of how those procedures can or should be accomplish. In contrast, descriptive frameworks characterize or describe KM. These frameworks identify attributes of KM important for their influence on the success or failure of KM initiatives [21]. The majority of frameworks presented in the literature are prescriptive frameworks. Rubenstein-Montano *et al.*, (2001) stated that although varieties of approaches to KM have been implemented across various organizations, these approaches do not adequately fulfill the KM needs of organization [21]. Two reasons have been identified leading to this situation, which are; the frameworks are not consistent with systems thinking, and lack of cohesiveness across frameworks. The KM frameworks, with their very general approach to KM, provide an excellent starting point for developing KMS. In other words, the KM framework becomes the baseline and provides guideline for what should be considered in the KMS implementation.

2.4 KMS

KMS are special type of information systems that supports activities related to the acquisition, generation, codification, storage, transfer, retrieval, and use of knowledge within organizations (Alavi & Leidner, 2001). For the research purpose, the KMS definition was adapted from Rusli Abdullah *et al.*, 2005a), which defined KMS as a concept that can be used for creating knowledge repositories, improving knowledge access and sharing as well as communicating through collaboration and managing knowledge as an asset in learning organization [22]. The idea of a KMS is to enable employees of an organization to have access to the company's knowledge of facts, sources of information, and solutions. Having employees share their knowledge (in brains and files) could potentially lead to more effective problem solving and it could also lead to ideas for new or improved products and services [28]. The goal of a KMS is to get the right information to the right people at the right time. This will increase efficiency leading to a competitive advantage. In other words, KMS are meant to support knowledge processes. These KM systems have been deployed in many organizations with the hope that they will have a positive effect on performance.

There are many perspectives for describing a KMS such as the technical perspective and the social-technical perspective [16]. *The Technical Perspective* consists of three components (Technologies, Functions and Knowledge). The technologies will support knowledge work and/or organization learning through its functions (using, finding, creating and packaging knowledge). While *The Socio-Technical Perspective,* KMS are seen as being complex combinations of technology infrastructure, organizational infrastructure, corporate culture, knowledge and people.

When building a KMS, there is no single approach that fits all industry, In general, three different approaches can be observed which are bottom-up, top-down and middle-up-down. Civi (2000) concluded that bottom-up approach put more emphasis on people rather than on information technology, top-down approach is basically the classic hierarchical model where organization takes as a pyramid which lie shape and middle-up-down [2].

2.5 KMS Framework Components

There are six important components that are combined together to become a framework of KMS and these components will become important elements in implementing KMS [22]. The components are:

i.   *KMS Architecture* - KMS Architecture consists of four layers: Infrastructure layer, technology layer, protocol layer and repository layer. Each layer is a client that links to the system and can access the knowledge repositories through infrastructure layer (internet, intranet and extranet) provided.

ii.   *KMS Application and Its Functionality* - The KMS application consists of Knowledge Portal, Electronic Document Management System (EDMS), Workflow system and On-Line Analytical Processing (OLAP). It explains how the functionality of these applications supports the KMS.

iii.   *KMS Taxonomy and Process* - It supports the four activities that are involved in KM process model in order to utilize the knowledge in organization. The processes are: acquiring knowledge, store, disseminating knowledge and use.

iv.   KMS Psychological - Explains the KMS soft issues on how motivations, awareness, reward play its role in supporting the development and implementation of KMS. It emphasizes on human factor in KMS.

v.   KMS Socio-culture - Focuses on KMS soft issues, which are strategy, belief, value and experience and how these issues give an impact on KMS. It emphasizes on culture and environment that encompassed in KMS.

vi.   KMS Audit - Consists of measurement activities in order to maintain and ensure performance of a KMS is according to its specification. It also can be used to benchmark the KMS to maintain its quality and productivity, as well as to increase its return of investment

3. Research Methodology

The research was based on literature analysis and field survey to investigate the general perception and acceptance of the people toward the current KMS implementation in their institution. The literature analysis covered the study of several KMS frameworks that have been introduced in previous studies. From the studies that have been done, a KMS framework that has similarity to the current KMS implementation in HLI has been chosen as a benchmark and baseline to the research. Then, a questionnaire was designed based on the selected KMS framework. The survey process was taken into place when the questionnaires were distributed to six PHLIs in Klang Valley. The research covered the respondents in PHLI in Klang Valley as the population. The field of research consisted of three main phases, which are:

i)   Data Gathering - Data collected using questionnaire was categorized based on KMS components that found in literature review.
ii)   Analysis - Data were analyzed using statistical tool Statistical Package for Social Sciences (SPPS) version 14.0. The purpose of data analysis is to test the hypothesis of this research.
iii)   Result and Discussion - From the analysis, results were interpreted and followed by discussion. Conclusion based on the objective was also provided. Lastly, some suggestions have been provided.

3.1 Data Collection Method

The questionnaires as the survey tool were used as a method in collecting data. The reason for selecting questionnaires as a tool was because it can reach many respondents in relatively short time. The set of questionnaire consisted of several sections. Each question in each section required respondents to either tick one appropriate response or tick more than one appropriate response. The overall questionnaire was designed as follows:

i)   Section A: Demographic Information; this section was designed to get the demographic information of respondents. All questions in this section are under nominal data type.
ii)   Section B: Perception on KMS; this section was designed to know how respondents describe knowledge as well as to know how respondents perceive the current KMS in their institution. All questions in this section are under nominal data type.
iii)   Section C – H: KMS Components; This section represented each of the KMS component in the KMS framework as a benchmark and baseline for the research. Each section represents each KMS component.

Likert scales were used for developing the questionnaire that based on the development of people's attitude access [12]. In this research, it also used to determine respondents' attitudes toward the current KMS framework implementation. The attitude was ranged from strongly disagree to strongly agree (1 to 5) and each attitude has been weighted by interval value.

3.2 The Sampling

The sample of this survey consisted of Academic staffs, Non academic staffs and Students of the six PHLI in Klang Valley. Two techniques were applied in selecting sample for this survey. The techniques were Blocking and Balancing [7]

i) Blocking Technique - Blocking means allocating units to blocks or groups so the units within a block are relatively homogeneous. [7]. In the research, the position of the respondents has been treated as blocks. All together, there were three blocks defined which are Academic staffs, Non Academic staffs and students.

ii) Balancing Technique - Balancing is the blocking and assigning of treatments so that an equal number of subjects are assigned to each treatment, wherever possible [7]. After doing the blocking technique according respondents' position, balancing technique was done by dividing the target respondents equally to the each block. Figure 3.1 illustrates how the Blocking and Balancing Techniques were completed.
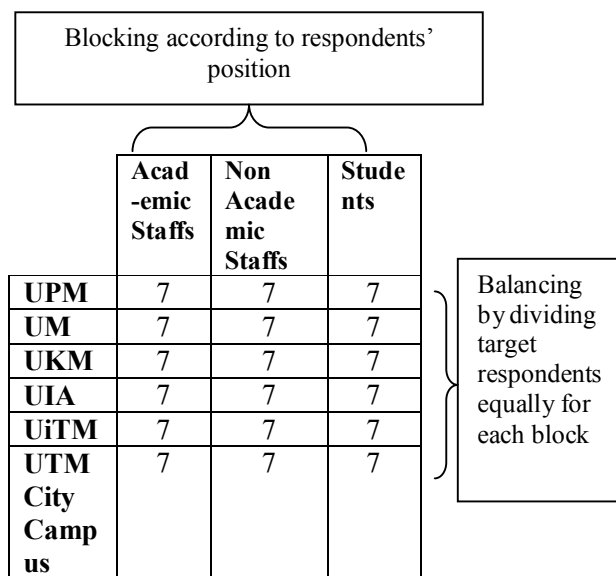
	Acad-emic Staffs	Non Academic Staffs	Stude nts
UPM	7	7	7
UM	7	7	7
UKM	7	7	7
UIA	7	7	7
UiTM	7	7	7
UTM City Camp us	7	7	7

Blocking according to respondents' position

Balancing by dividing target respondents equally for each block

Figure 3.1: Blocking and Balancing Techniques

3.3 Data Analysis Method

The statistical technique that was applied in analyzing the data is:

i. Descriptive Statistic - Descriptive analysis was used to indicate the central tendency of the data. Generally,

it has provided the mean, median, mode, standard deviation, and variance, skewness and standard error of skewness and range of data. From this analysis, the distribution of data can be determined. In the research, the distribution of data whether normal or not normal distribution was determined by looking to the skewness and standard error of the skewness. If Skewness/Standard Error is between -2 and +2, then the sample is normal based on skewness and using a parametric test was allowed. (Corder, 2004). Identify the distribution of data are important in order to determine what statistical technique can be used in testing the hypothesis [4].

ii. Frequencies Statistic - Frequencies statistic was used to look the distribution of data in term of frequency and percentage. For example how frequent respondent answer YES and from this frequency a percentage for particular data have been drawn.

iii. Cross-tabulation Statistic -This statistic was used in order to test and measure the association of two-way tables. In other words, it was to indicate the relationship of two variables. It helped to give insight meaning of variable by given another variable.

Histogram and Pie Chart - In drawing the graph, histogram and pie chart format were used. The histogram and pie chart were generated from the frequencies statistic. And were found very helpful in term of illustrating the data using drawing technique.

4. Findings

Six main elements were identified from the data analysis process. The elements are lack of awareness of KMS Implementation, unutilized technical components, applications and systems, ignorance of advance technology, cost of KMS implementation, lack of incentives and rewards and unaware of KMS Audit.

4.1 Lack of Awareness of KMS Implementation

By examining the Figure 4.1, which is the overall percentage of KMS components, it shows that answer for NOT SURE which is 28.8% gained higher attention from the respondents. NOT SURE means that, the respondents were not sure whether the KMS elements for each KMS component were applied or implemented in the university. The data reveals that, there is lack of awareness of KMS framework and its implementation in the university. It was supported by certain elements (variables) that scored highest percentage for NOT SURE, which are:

i) 48.8% respondents were not sure whether agent technologies were used in KMS or not

ii)   53.7% respondents were not sure whether KMS was important to university or not.
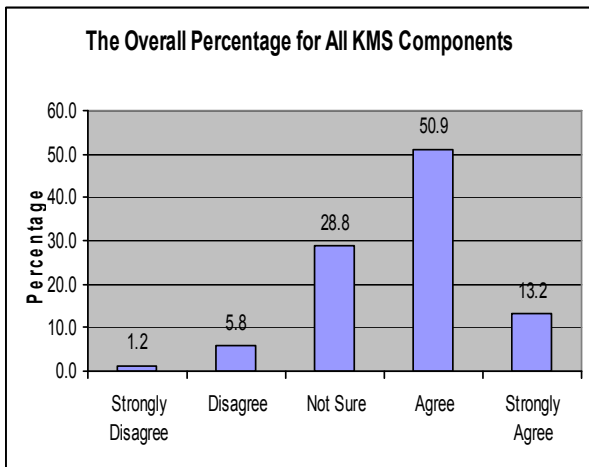
iii)   45.1% respondents were not sure whether there were incentives and rewards provided by university to who contribute in creating and disseminating knowledge.

Figure 4.1: Histogram of the Overall Percentage for All KMS Components

Because of lack of KMS awareness, users did not know how to help or participate in order to improve the KMS implementation in the university. This was proven by variable, where 46.3% respondents were not sure whether the feed back mechanism was taken care of in order to audit the performance of KMS. This mechanism is very important in order to know whether current KMS is responded as it is supposedly and it is also a way to indicate whether KMS is fail to function or vice versa.

4.2 Unutilized   Technical   Components, Applications and Systems

Although there are many technical components such as browser, search and retrieval tool, email and groupware, software agent/filter, and WWW server/communication software adopted in KMS, many of the respondents used technical components that they were familiar to or the technical components that are widely used in the particular university (the popular components used in searching and disseminating knowledge). It cannot be denied that the other technical components e.g. software agents, videoconferencing may have powerful functions, however because of these components were not widely used in the university, has caused them not to be fully utilized. The survey shows that they preferred to use browser, search and retrieval tool, and email and groupware rather than the other components which was indicated by higher

percentage of YES.(Browser = 82.9% , Email and Groupware = 64.6% and Search and Retrieval Tool = 51.2%) .

Similar situation also went to the applications and systems that were used in capturing, storing, disseminating and using of knowledge. For the applications, it shows respondents were more familiar to knowledge portal are scored higher percentage for YES (73.2) rather than other applications. Meanwhile for the systems, it shows respondents used more (library, publication and standard (92.7%), information via internet (69.5%), and internal lectures (61%) in disseminating and sharing knowledge) and (shared files system (53.7%) and documented procedures (53.7%) in capturing knowledge) rather than other systems. It seems that other applications and systems were ignored.

4.3 Ignorance of Advance Technology

It appears that advance technology was unutilized in the university. It was confirmed by the data, which shows that Software Agent/Filter and videoconferencing scored high percentage for NO (Software Agent = 61% and videoconferencing = 78%) compared to YES. This result was also supported by data that concluded 48.8% of respondents were not sure about the usage of agent technology in their university. However, respondents still believe that KMS should be provided with the latest technology (such as software agent) that can reduce interference and enable it to work on behalf the user in order to support and solve problem. This statement was supported by the highest percentage (57.3%) scored for AGREE.

4.4 Cost of KMS Implementation

Implementing KMS is not costly. 76% of respondents responded to STRONGLY DISAGREE to NOT SURE. However, respondents believed that later on, KMS will increase the administrative costs; this condition is depicted by (47.5%) for AGREE to STRONGLY AGREE.

4.5 Lack of Incentives and Rewards

By giving away incentives and rewards to those participants in KMS activities is a good policy in order to maintain the effectiveness of KMS. It shows that most of the respondents agreed to the statement of incentives and rewards must be awarded to the staffs for their sharing, searching and using of the KMS as an encouragement or motivation. Although respondents agreed to this statement, it shows that respondents were not sure whether this kind of method or policy was applied in the university. 45.1% of the respondents responded NOT SURE when they were asked about it.

4.6　Unaware of KMS Audit

Regarding to the KMS Audit, it shows that the respondents agreed (49.6%) with KMS Audit as one of the KMS components. However, the KMS Audit was not fully implemented in the university due to some reasons below:

i. Respondents did not realize the existence of any mechanism for improving KMS implementation in the university. It is shown by the higher percentage for NOT SURE (51.2%).
ii. Feedback mechanism was not fully implemented because many respondents were not sure of its existence. It is shown by high percentage for NOT SURE (46.3%).
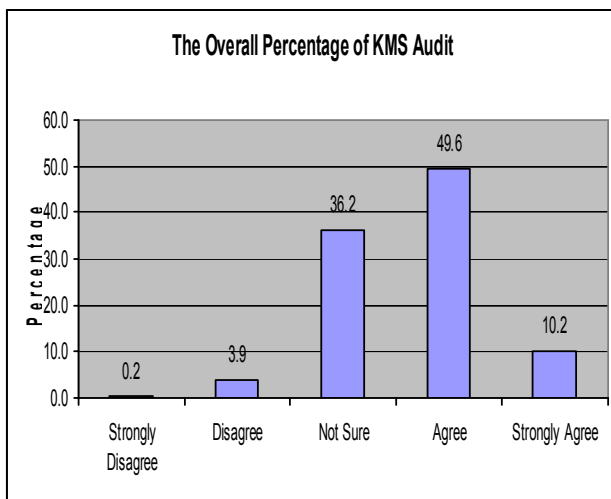

Figure 4.2: Histogram of Overall Percentage for KMS Audit

5. Discussions

The discussion is divided into two parts based on the objectives of the research. The first part is the perception of KMS; here the discussion is made on how users (respondents) describe knowledge and how they perceive the KMS in their university. The second part is the current state of acceptance and implementation of KMS framework; here the hypothesis is concluded and discussion is made based on the result of the hypothesis testing. From the result, suggestions on
what should be included in a general KMS framework are presented and discussed.

5.1　Perception of KMS

Most of the respondents described knowledge as Training and Learning. It is shown in Table 4.1. One factor may

lead to the Training and Learning scored the highest percentage was that all respondents respective to their position encounter Training and Learning formally and thus, this Training and Learning is beneficial and helpful to their routine businesses. The two situations that were highlighted below can be some of the examples that may lead to this conclusion:

i. If there is a new task identified, usually university will send the staffs to get formal training. From this training, staffs will learn how to manage the new task. Gradually the process of training and learning become knowledge for the staffs.
ii. Attending a class is a formal learning for students. This kind of learning is essential for the students in order to face the examination. Sometimes, they will be sent to attend training in order to enhance their learning process that they have obtained from the class.

Most of the respondents perceived KMS as a major strategic imperative and as a new way to add value. Only a small portion of respondents perceived KMS as another management fad.

Table 4.1: Frequency Table of Respondents Describe Knowledge

Describe Knowledge		Freq-uency	%	Valid Percent	Cumulative Percent
Experience	N	33	40.2	40.2	40.2
	Y	49	59.8	59.8	100.0
	Total	82	100.0	100.0	
Training & Learning	N	19	23.2	23.2	23.2
	Y	63	76.8	76.8	100.0
	Total	82	100.0	100.0	
Hard Info	N	54	65.9	65.9	65.9
	Y	28	34.1	34.1	100.0
	Total	82	100.0	100.0	
Soft Info	N	56	68.3	68.3	68.3
	Y	26	31.7	31.7	100.0
	Total	82	100.0	100.0	
Interchange with other Tacit Knowledge	N	56	68.3	68.3	68.3
	Y	26	31.7	31.7	100.0
	Total	82	100.0	100.0	
Value	N	67	81.7	81.7	81.7
	Y	15	18.3	18.3	100.0
	Total	82	100.0	100.0	

5.2 The Current Acceptance State and Implementation of KMS Framework

From the study of hypothesis testing, it clearly shows that the KMS framework implementation in the university is accepted. However there are some elements that must be considered. KMS Architecture seems not to be accepted since 5 out 8 variables indicated that there are significant different between the population mean and the sample mean, however this component is main the component and very important to KMS framework. It was described as the backbone to support the KMS [23]. From the research, some attention must be given to the following situations:

i.   How to make sure certain search engine in Intranet and Internet can be used easily to find information.
ii. The need of more powerful security system.
iii. The need of advance technology (e.g.: Software Agent).
iv. Well-organized data repositories.
v.   How the technical components protect users if they contribute information in the system.

It can be summarized that elements such as infrastructure, security system, technology, and data repositories must be defined clearly and must be given full attention. From the finding, it states that there is lack of awareness of the current KMS implementation. An awareness mechanism is important to make the users are more aware of the various functions available in KMS. From the research, it indicates that lack of awareness lead to some situations:

i.   Users did not know what applications; technologies and system that are used in university in order to achieve successful KM. Application, technologies and systems that associate with KMS have main functions as communication mediums between users and knowledge.
ii. Users were unaware of latest technology that is implemented to KMS. This causes the technology to

not fully utilize. So the implementation is viewed as wasteful of resource.
iii. Users did not realize the existence of any mechanism that is required to improve the KMS. This mechanism allows tracking how well the KMS reaches the goal set [11]. The feedback mechanism is not taken care seriously by the university. It can cause users cannot participate in improving KMS. This mechanism also allows the detection of any problem/ shortcomings/ improvements that the defined metrics are not able to identify [11].

All of the problems that were indicated can be solved by successfully implementing awareness to the KMS. The awareness can be created through two main areas, which are broadcasting, and training and learning. The function of Broadcasting is to inform any changes happen in KMS implementation. On the other hand, the Training and Learning are provided to ensure users will not left behind in taking advantages of knowledge provided. In other word, it is to ensure that KMS is fully utilized. By identifying the importance of awareness to KMS, the previous KMS framework for HLI by Rusli Abdullah *et al.,* (2005a) was modified [22]. This framework is a prescriptive framework. In the modification of KMS framework, KMS Awareness was made as individual component for KMS framework. It was different from pervious worked by Rusli Abdullah *et al*, (2005b), which stated awareness is only a part of KMS psychological component [23]. To illustrate the collaborative in the modification of KMS framework, a model of collaborative that was introduced by Rusli Abdullah, *et al.,* (2005a) has been adopted [22]. The modification of KMS framework is presented as Figure 4.3 as below.

KNOWLEDGE MANAGEMENT SYSTEM					
<u>Socio-Culture</u> Strategy Believe Value Experience	<u>Process</u> Capturing Storing Dissemination Using	<u>Application and</u> <u>Its Functionality</u> Application Functionality	<u>Architecture</u> Technology Infrastructure Repositories	<u>Psychological</u> Motivation Reward	<u>Audit</u> Performance Security Compatibility
<u>Awareness</u> Broadcast Training and Learning					
Academic staffs, Non-academic staffs and Students					

Figure 4.3: A Modification Framework of KMS

In addition, the finding indicates that KMS Audit gained less attention in KMS implementation. Respondents were not aware how the audit takes place in the KMS. It suggests a clear interaction between KMS Awareness and KMS Audit. It can be achieved by implementing the Audit Mechanism as well as Feedback Mechanism. In implementing the KMS framework, issue of incentives and rewards must be considered. The role of incentives and rewards must be clearly defined. These incentives and rewards are regards as encouragement, motivation and to tighten the commitment of the users to KMS. Malhotra and Galleta (2003) stated that commitment and motivation would facilitate balanced investment in technology infrastructure and social-culture infrastructure required for leveraging tacit knowledge. It also helps in alleviating the knowledge application gap resulting from what users know and what they do or vice versa [14].

6. Conclusion

The limited of KMS frameworks that have reached prominence and board audience explained that the generally accepted framework for KMS has not been established. The research aimed to investigate the current state acceptance and implementation of KMS framework especially in learning institutions namely PHLI in Malaysian situation. The research was conducted based on three main objectives, which were achieved through the data collection using survey techniques and the detail data analysis of the survey results. Although there are many studies that introduced KMS framework, it indicates that only a few of the frameworks have reached prominence and a broad audience which means, generally accepted framework for KMS has not been established. The discussion of KMS focused more on collaborative environment in HLI. Using the literature as the basis, the finding from the survey was discussed and a modification of previous KMS framework is suggested.

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