

Empowering Technical EDUCATION institute through Harvesting Tacit Knowledge: An Empirical Study at Kolej Kemahiran Tinggi MARA Kemaman, Malaysia

Shamsiah Husin, Alwi Mohd Yunus and Ahmad Zam Hariro
Samsudin

Faculty of Information Management, UiTM Kampus Puncak Perdana, Universiti Teknologi
MARA (UiTM), UiTM Selangor, Malaysia

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Abstract

Knowledge management in academic institution become an essential tool to ensure the new knowledge, ideas and innovation is continuously build up to enhance the institution's performance and achievements. Knowledge harvesting is a practical method to design and implementing in academic institution in order tacit knowledge can be managed and use effectively. The purpose of the study is to identify the nature of the tacit knowledge that is already exist in the academic institution specifically at Kolej Kemahiran Tinggi MARA (KKTM) Kemaman. Qualitative research methodology has been designed through interview, survey and document review to gather data and analysis the research study. The study then come out with the recommendations focusing on the knowledge harvesting framework and KM tools in empowering knowledge sharing culture in the institution.

Keywords: Knowledge Management, Knowledge Harvesting, Tacit Knowledge, Knowledge Sharing.

1.0 Introduction

In the 21st century, knowledge become valuable asset to support the development and sustainability of the organization. As a learning institution, Kemaman MARA Higher Skills College (KKTM Kemaman) has a human capital that can be leverage it for the development of the institution. Main business of KKTM Kemaman involved teaching and learning programs which offer is mainly focusing on oil and gas programs such as electrical, mechanical, piping, instrumentation and control, offshore; and onshore structure programs.

Learning environment in this organization is hands-on training and workshops. The students need to develop their projects involving technical skills apart from the need to attend classes for theory learning. Practical training in the workshop requires skilled trainers. The instructors

in this institution has an engineering technology education background compliments with experiences in engineering industry.

As an academic institution, learning methods such as practical, workshops, discussions, hands-on and classroom is a process transferring tacit knowledge to the students. Trainers who have the skills and expertise in the field of electrical, mechanical, offshore, onshore operation, instrumentation and control is a human capital to the institution. Their knowledge should be manage effectively so that the investment of institution to the staff in completing their competency do not go with them when they move to another organization or resigned.

Based on the observation, knowledge of the institution is not manage effectively for reuse and as a competitive advantage to the institution. The knowledge can be manipulate for organizational performance through best practices in learning environment by implementing knowledge management in the institution.

2.0 Literature Review

Knowledge management in academic organizations today is necessity to ensure the new knowledge, ideas and innovation in developing the performance of an organization. It is common phenomena in the systematic teaching and learning process, new knowledge are created. However, the new knowledge that is not managed effectively only benefit certain parties and not comprehensive as a whole to the organization.

Drucker (1995) mentions that we are entering the knowledge society in which the basic economic resource will be knowledge as explanation is there for our eyes to see and ears to hear, but all those wishing to see their organization's survive.

2.1 Knowledge Management Overview

Fundamentally, knowledge management is about applying the collective knowledge of the entire workforce to achieve specific organizational goals. The aim of knowledge management is not necessarily to manage all the knowledge that organizations have but to manage critical and most important knowledge that can be benefits by the organizations for business value creation and their performance.

Knowledge commonly exist in the form of tacit and explicit. Explicit knowledge is in a tangible form, which is recorded, and easily access by everyone in an organization such as standard of procedure, guidelines and work process. Meanwhile, tacit knowledge is in an intangible form which is reside in the individual brain such as an experience or skill, and not apparent but allows the expert to use information better. Snyder and Wilson, 1997, elaborated tacit knowledge as "one can postulate that is the vast reservoir of tacit knowledge that an expert can bring to consciousness in a situation of need that makes him/her an expert". Tacit knowledge is the most valuable asset to the organization that hidden in the experts. However, how organization can leveraged this asset for organization performance and sustainability. This is where the process model called knowledge harvesting is brought to discuss through case study method in the technical education institute. Before that, knowledge definitions need to examine before knowledge harvesting process and approaches.

Nonaka & Takeuchi, 1995 define knowledge management as the capability of an organization to create new knowledge, disseminate it throughout the organization and embody it into products, services and systems. David J Skyrme, 1997 stated that the knowledge management is the explicit and systematic management of vital knowledge and its associated process or

creating, gathering, organizing, diffusion, use and exploitation. It requires turning personal knowledge into corporate knowledge that can be widely shared throughout an organization and appropriately applied.

There are a few definitions of knowledge management in Table 1, as follows:

Table 1:

Definitions of knowledge management

Authors/Body	Definition
BSI's A Guide to Good Practices in KM	The capabilities by which communities within an organization capture the knowledge that is critical to them, constantly improve it, and make it available in the most effective manner to those people who need it, so that they can exploit it creatively to add value as a normal part of their work
Peter Drucker	Knowledge is power, which is why people who had it in the past often tried to make a secret of it. In post-capitalism, power comes from transmitting information to make it productive, not from hiding it.
Maggie Haines, NHS Acting Director of KM	Knowledge management is a process that emphasizes generating, capturing and sharing information, knowing how and integrating these into business practices and decision making for greater organizational benefit
Abell & Oxbrow, 2001	The creation and subsequent management of an environment, which encourages knowledge to be created, shared, learnt, enhanced, organised and utilized for the benefit of the organization and its customers.
Yankee Group	Knowledge management involves efficiently connecting those who know with those who need to know and converting personal knowledge into organizational knowledge.

Sources: NHS National Library for health, 2005.

As a result, the definition of knowledge management from this research perspective and view is the capabilities of the organization to capture and organize knowledge that reside from the experts and reuse the knowledge for teaching and learning activity in making continuous improvement for institutional excellence.

2.2 Knowledge Harvesting Process and Approaches

In learning organization, knowledge harvesting can be leveraged judiciously to codify some human expertise in such ways that others can reuse it, for instance during staff induction or through learning and development programs, good practices and how-to guides. Knowledge harvesting can be applied to any field of human activity in an organization such as in operations, services, strategies and event management. There are several factors and principles that drive the knowledge harvesting design (Olivier Serrat, 2010):

- i) Tacit knowledge enablers and inhibitors
- ii) The criticality of the knowledge to the organization
- iii) The need for immediate transfer

- iv) The complexity of the knowledge topic
- v) The qualities of knowledge contributors
- vi) The characteristic of knowledge seekers
- vii) The dispersion of knowledge contributors and knowledge seekers
- viii) The type of facilitation required
- ix) The need for external review and validation

For the high-performance organization's practices, they harness the intellectual capital of retirees. They take advantage of the skills required of skills and experience through programs and projects such as mentoring junior staff, learning programs and storytelling. In the same spirit, they are also used to help check and verify harvested knowledge.

As a definition, knowledge harvesting is an integrated set of processes that reside in the experts are converted into specific, actionable know-how which is can be transferred to others through accessible medium. In the process, experts verbalize their tacit know-how and thereby make it explicit. Tacit know-how is composed of the subjective knowledge, insights and intuitions possessed by a person who has a depth of understanding in a particular area (Wilson,1997).

Based on Olivier Serrat, 2010, there are seven steps for knowledge harvesting approaches, however the intricacies and resource requirements of which necessarily depends on the object and scale of the organization. The seven steps are involved focus, find, elicit, organize, package, evaluate and adapt as explained follows:

i) Steps 1 – Focus

Organization should identify the critical knowledge that can be used it for beneficial for the organization. identify also individuals who likely to contribute to the critical knowledge. The organization can then harvest mindfully, with reuse and learning and development insight.

Step 2 – Find

Organization should identify the critical positions where knowledge harvesting stands to generate most benefits and where the knowledge loss is the greatest threat for the organization. Organization also should locate and prioritize the specific know-how at risk.

Step 3 – Elicit

A process of guiding and encourage person to share their skills and experiences. This process preferably using one-to-one, face-to-face interviews supported by video and audio recording. This kind of process also required knowledge harvester have a strong communication skill, interpersonal and interviewing skills coupled with high emotional intelligence.

Step 4 – Organize

The knowledge elicited must be examine for the purpose to know recurrent patterns, as well as gaps and inconsistencies. The knowledge then should be arrange in coherent and systematic forms to facilitate access in future. Classification and categorize the knowledge will take place for this step in order the knowledge can be benefits by the organization.

Step 5 – Package

The knowledge must be packaged into deliverable knowledge assets and made available through media that are tightly integrated with the original purpose of knowledge harvesting in an organization.

Step 6 – Evaluate

The knowledge should be monitor and evaluate for its relevancy, efficiency, effectiveness, sustainability, and impact of outreach and also for further enrichment from continual harvesting.

Step 7 – Adapt

Means that, knowledge assets are shared and applied. The organization must facilitate, empower and documenting the instances of learning so that the critical knowledge asset can be continually developed.

2.3 Knowledge Sharing Culture and Challenges

Culture is a term that involved the values, attitudes and behavior of an individual in an organization. Organizations are communities of individuals and each enterprise has a different culture that describes how people relate to one another (Goffee & Jones, 1996).

Culture is a very crucial in the organizations because it will influence human behavior powerfully and resulted from that, it is extremely hard to change (Kotter, 1996). Based on Gupta & Govindarajan (2000) elaborated the influence in invisible ways such as the types of questions and comments, the formal and informal expectations, reward system focus, and people interaction. Therefore, particular forms of behavior in knowledge sharing initiatives will be affected by organization's culture.

There are four key reasons how culture influences the knowledge sharing initiatives in an organization (DeLong & Fahey, 2000):

- i) Culture will shape people's assumptions about what knowledge is vital and important to share.
- ii) Culture determines the relationship between level of knowledge which is organization's knowledge and individual's knowledge
- iii) Creating a context of social interaction such as interaction, collaboration which results in reward or punishment
- iv) Shapes the creation and adoption of new knowledge.

Knowledge sharing is antagonistic to an organization. In the context of this culture, knowledge is considered as power, so information hoarding is the norm. Organizational challenge today is to promote and facilitate a culture of knowledge sharing within the organization as well as discourage industrial age thinking and behavior.

3.0 Methodology

3.1 Research Design

The purpose of the study is to investigate the nature of knowledge in the organization to determine how knowledge harvesting in the process of tacit knowledge capturing could improve knowledge value as a means of ensuring operational excellence. It is important to consider the use of the case study if the research consists of one organization and if the objective of the study is to observe patterns of internal and external influences (Simon, 2006). Based on Dzekashu and McCollum, 2014, Trochim (2001) has demonstrated that a case study is appropriate if the research consists of the intensive study of a specific context. However, there are authors who have defined qualitative research by comparing it with quantitative research. The key difference between both methods, qualitative and quantitative, is in terms of their number of variables and cases analyzed (Ragin, 1987). The differences between both methods, quantitative research includes fewer variables and many cases.

To investigate the problem statements and achieve the objective of this study that was outlined, case studies carried out using empirical methods of study, which is describe what is happening based on the survey, observation and interview or defined as qualitative study.

The research conducted was in alignment with the variables of qualitative research because it were reflected with the setting of the organization under study, the role of the researcher, the type of the data collected, and how the data were collected and analyzed to produce the results. The options to use one organization for the research to ensure that data obtained from the study can be analyze from the research site. The information collected in the field studies were geared towards providing an answer to the "how" questions that are raised from the analysis of the nature of knowledge and knowledge creation activities as well as knowledge sharing in an organizations. Although the study referred to the possibility of using a quantitative approach for the analysis of data collected through surveys, Simon (2006) emphasized that it is more appropriate to use qualitative methods of research in which the structural defect exists in the data and presentation of the data is subjective.

3.2 Sampling Methods and Procedures

The selection of the academic department such as Piping Program, Electrical Program, Mechanical Program, Instrumentation & Control Program, Offshore Structure Program; and Onshore Operation Program as well as other departments are appropriate for the study conducted because their functions that directly and indirectly for improving and creating knowledge assets within the organization.

Approximately half of the 51 participants of the total 90 employees, random sampling method was used. Expert population consisted of 51 officers in the field of engineering technology. The participants were selected in this study includes individuals with expertise in their respective fields such as the Offshore Structure, Onshore Operation, Piping, Electric, Mechanical; And Instrumentation and Control. Justification for the selection procedure are based on two categories. First, get the views of the individual who has special expertise in their field to determine the nature of knowledge. Second, experts can prove and validate the opinions of others.

Participants have been selected in the same amount for each units / programs from different departments to respond to the survey and complete an interview. Participants who answer surveys and interviews are individuals in managerial and profesional level. Document review also used to obtain accurate data and information.

3.3 Instrumentation

The study involves the use of mixed-mode, face-to-face interviews, and surveys via e-mail. Each interview approach has advantages and disadvantages. Face-to-face interview is lengthy interview methods and aids such as drawings and photographs can be used to assist in understanding questions and clarification on a topic at hand. According Singletonand Straits (2005) describes the advantages of using the interview face-to-face is it has a high response rate, typically up to 80%. Whereas, according to Trochim (2001) argued that interviews are generally easier for the participants, especially if the researchers conducted interviews to get the views, opinions or responses. Furthermore, since this study was to use methods qualitative, the open question is appropriately used to obtain participants' perceptions.

Interviews face-to-face and questionnaires used to collect data from participants in the study to help identify the biases inherent in both method (Singleton & Straits, 2005). The advantages of conducting surveys via online methods that are inexpensive and do not require a supervisor interview. Meanwhile, there are also disadvantages of this method, which requires time to complete the data collection phase. While the study methods are effective to produce reliable results, Singleton and Straits (2008) emphasizes the use of interview because this method allows researchers to control study that researchers have the opportunity to explain the question to the participants of the study, the answer is more appropriate or control the situation study until the study is complete. To complete the process of data collection through questionnaire, researchers need a third party who is research assistant for sending and collecting questionnaires to participants who are selected based on the scope of the study, but the interview face-to-face is conducted by the researcher personally.

Hence, the results of this study are unique to the organization because the survey and interview face-to-face were used as a research instrument. The study also did not be generalized. However, there are best practices drawn from the study that can be use by the organization.

3.4 Data Collection and Analysis

To understand the nature of knowledge and to identify the process of capturing tacit knowledge in the organization, primarily survey and interview were used. Document review and interview has completed the basic studies. Questions posed in this study is an open-ended question. Use open-ended question allows more solutions to very important and critical issues in the study. Closed-ended questions are used only to obtain demographic data. For the collection of information through interviews, audio tape recorders have been used and writing notes also recorded. After collecting the data, the data has been consolidated, transcribed and coded to ensure the name of the participants is anonymous for better handling in terms of analysis, preparation, storage and search.

One of the method that has been used to categorize and codify data from different sources of data findings are from survey. After the data is collected through survey process, matrix of the answer has been completed to facilitate the analysis process. After completing the interview transcript, aggregation, and identification of key issues in the study, the rest of the analysis was completed.

Strategies for data analysis begins by taking field notes during the collection of data from different sources and the comparison is made (Creswell, 1998; Merriam, 1998) for consistency. The content analysis is practical when researchers use open-ended question to obtain information, because this method allows determining the category through coding.

4.0 Findings

4.1 Evaluation of research data

The demographics of the experts' staff such as age, gender, education level, job classification and length of the service were analyzed to identify the nature of the knowledge. The sample of the data were extracted from the staff's database of Human Resource Management System and document review. From the database, there are 51 staff who are experts in the technical engineering, 15 in general studies including mathematics, English, Islamic education and

entrepreneur, and 24 administrations staff. However, 51 staff who are expertise in the field of engineering technology has been selected as participants in this study. Table 1 provides the educational level data of the research participants and Table 2 provides the length of participant's experience including both teaching and industry.

Table 2:

Educational Level and expertise area

Expertise area	Educational level		
	Degree	Master	Total
Piping	4	4	8
Electrical	6	5	11
Mechanical	3	6	9
Offshore Structure	5	3	8
Onshore Structure	3	1	4
Instrumentation & Control	6	5	11

Table 3:

The length of participant's experience

Expertise area	Length of experiences (Month)		
	Teaching	Industry	Total
Piping	84	111	195
Electrical	102	534	636
Mechanical	95	156	251
Offshore Structure	80	360	440
Onshore Structure	80	124	204
Instrumentation & Control	98	576	674

Based on the expertise area and length of experiences, the study can concluded that the most experienced staf are in the Electrical; and Instrumentation and control Department. This is crucial step to identify and capture the expertise and experienced staff in this institution. Initial participants were selected as a first point of contact and were considered the most knowledgeable involved in the knowledge process in the institution. These initial participants were very senior members of staff, who then selected additional members of staff to take part in the case study. The participant's roles are shown in the Table 3.

Table 4:

Participant's Role

Role	Number	Main Process
Director	1	Strategic pelan, administrative and financial management
Executive Director	2	Students and academic management
Head of Program	7	Curriculum development and management
Librarian	1	Resource center management
IT Person	1	Database and networks management
Industry Affair Officer	1	Industry engagement management & public relation

Based on the participants roles, the most units and department who are involve in the main process is Director, Executive Director and Head of program, and the rest is act as supportive to support main process.

4.2 Analysis of Relevant Research Data

This study has produced valuable insights data on the perception of Knowledge Management practices in the institution. From this study purpose, two major aspects from the interview and document review will be discuss, namely:

- i. Characteristics of academic staff
- ii. The context and characteristics of institutions, focusing on:
 - Culture
 - Difficulties experienced
 - Management structure and style

The discussion of these major aspect will reflect to the three problem statement which is knowledge creation is not effectively managed; there is no guidelines for knowledge harvesting implementation and lack of sharing knowledge culture within institution.

4.2.1 Characteristics of Academics

One question asked in "Perception KM" in an interview session with the theme "Why knowledge sharing is not widely practiced in this institution" and "How knowledge creation managed for the purpose of reuse the knowledge". This question has sparked a discussion in depth the nature of "academic", the characteristics and culture of this institution is seen as a factor to the difficulty in implementing changes in the context of KM. In this context, addressing key issues related to the nature of their work, expertise in their field and their views should be as experts are most qualified to judge the methods and pedagogy implemented in relation to their perception of knowledge management. The issue of academic arrogance also raised the issue of academic freedom. Another theme that emerged from the survey data is the academic staff do not want to be managed like a business. The nature of their work are those that have a complete unit.

Based on the perceptions of knowledge sharing culture in the institution, there are some perceptions from participants about this issue. Staff felt their position threatened if they share the knowledge and skills with colleagues. This causes them to become defensive when asked to contribute to knowledge sharing activities. Some staff adhering to the concept of reward in which the contributions given should be paid in rewards system such as incentives and promotions. There was also an attitude of paranoia and distrust if knowledge shared will credit be taken by others. There are fears that if they are unable to carry out their primary task properly if they involved in knowledge sharing. Other than that, there is perception that knowledge sharing is just and irritating waste of time and unproductive to individual work schedules.

However, a respond from a very senior academic and administrator also had this to say.

"We need to develop more of a team with the concept of sharing ideas and innovation. It would be inclined to this concept naturally as a team. If they have a chance to speak, have time to deal and talk with their peer group and take advantage of this concept, it would set a precedent for others though originally not accepted. Moreover, they can see the benefits in the sharing process."

While this view assumed that the academics are quite open to sharing ideas, there is the issue of creating opportunities for interaction, and the real issue is an innovation and publishing where the aim is against sharing of ideas in the beginning, by the time the issue of the sharing of research innovation.

Table 5:

The characteristics of academic staffs

<i>Characteristics of academics</i>	<ul style="list-style-type: none"> • <i>Provide long service</i> • <i>Fond of their own voices</i> • <i>Self-sufficient units</i> • <i>Academic freedom</i> • <i>Natural unit of working</i> • <i>Personel responsibility</i> • <i>Why share a research initiative?</i> • <i>Academic expert</i> • <i>Don't want to be managed</i> • <i>Arrogance</i> • <i>Silent</i> • <i>Open the ideas of sharing</i> • <i>Owned the knowledge</i>
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Knowledge Management perception among academic's staff is that their work involves managing the knowledge that they are the managers of their own knowledge, and with it has been directly involved in some stage in the process of KM. Academics also generally tend to serve longer to the institution. Therefore, when they decided to leave the institution, this could adversely affect the program and the institution, especially if the academic staff is an expert in a particular field and become a reference to the other staff. This raises major issues about the importance of intellectual capital, especially in this context and the use of the principle of effective knowledge management is very important to address this challenge.

Another issue that exists is generally affiliate academics themselves with the program or research discipline as the first, and then by the institution. This could be identified as their priorities and loyalty to the institution. This finding is consistent with research Becher (2001), which was published in 1989. The institutions or universities in general are influence by this rule and institutions are able to encourage changes and initiatives development in institutions widely. For example, KM is difficult to be adapted unless it is perceived and demonstrable benefits in the academic and individual's level.

4.2.2 Characteristics of institution

Second aspect is characteristics of institutions. Interesting concept that emerged will be discuss as seen in a Figure 5. For the purpose of this research, the issues such as culture, difficulties experience, management style and structure will be explain.

Table 6:

The characteristics of institution

Institution				
Culture	Structure	Information hoarding	Management style	Difficulties experienced
<ul style="list-style-type: none"> - Creative - People management lacking - No sharing ideas activities - Slow to make decisions - Collegiate - Academic and admin divide - Competitive 	<ul style="list-style-type: none"> - Delivered way of working both manually and through system - One way communication (top to bottom) 	<ul style="list-style-type: none"> - Corporate change - Technological change - Process change 	<ul style="list-style-type: none"> - Responsive to change - Multiple objective and aims - KPI driven - Non-profit approach - Traditionally collegiate 	<ul style="list-style-type: none"> - Dynamic environment - Excellence mission - Behind other department (stakeholder)

4.2.2.1 Knowledge Sharing Culture

The best way to define a culture that are relate to the KM is a definition from a behavioral concept. Based on McEllroy & Firestone (2003), culture is a shared, learned human behavior and a way of life. This definition is use successfully in the analysis of cultural at societal level. At the organizational level, it can be used to refer to the learned behavior among individuals that are resulted from general socialization as opposed to shared and learned behavior that results from organizational socialization.

From another researcher who is Morgan (1986), defines culture as a shared meaning, shared understanding and shared sense making that contribute to the personality of individual or an organization. For this study, senior and middle management employees of the head of program be the first to get involved in making decisions that affect the operation of institutions were interviewed. However, sometimes the perception of these two groups have significant differences of opinion outside the scope of this study.

In this study, academic and administrative have a differences perceptions towards KM scope which the administration suggest:

"Academic group had more culture of sharing. But, on the administration of information sharing only true if there are questions to get the information and if a question should be to the right so that the information is correct up as required. "

However, this sharing culture also vary by the departments. There is lack of knowledge sharing activities within the departments. This sharing culture is only 10% of the total technical staff. Staff have barriers in implementing knowledge sharing in terms of workload of staff who have reached 28 teaching hours of the 33-hour working a week. Other barriers are no incentives given to staff who have the initiative to share knowledge. The attitude also a challenges to the success of knowledge sharing as staff will share their knowledge if it is the task and work instructions. Because there is no method of execution and systematic planning in the concept of knowledge management, the sharing of knowledge is solely on the initiative and efforts of the staff. It is not compulsory program.

4.2.2.2 Management Structure and Style

Each institution has a different management structure and style. In this study, the institution does not have a clear role in the concept of KM implementation. However, in the institution's mission statement, the institution wants to achieve a competent and innovation human

capital. Thus, the elements and the concept of KM have a good chance to be apply and implement. Advantages of Knowledge Management are not only facilitating the collaboration in the innovation process but also include identifying the gaps between knowledge base and remedies to fill the gaps (Samina, Tahira, Muhammad Mohsin & Muhammad Fawwad, 2015).

Table 7:
The management structure

Director	Executive Director (Academic Development)	Head Of Programs (6 Program)
		General Studies Department
		Examination & Certification Units
	Executive Director (Students Management)	Resource Center Unit
		Industry Unit
		Counseling Unit
		Administrative Unit

The management structure show that the top management will has the power to influence decisions in the organization and direction from top management will be brought to a middle management and group of practitioner.

This institution is driven by Key Performance Indicator (KPI), which is involve the areas as follows:

Table 8:

Knowledge creations in an organization (Source: KKTMM Kemaman's KPI record for first quarter Jan-Mac 2017)

Performance Indicator	Knowledge Creation	Details
<i>Collaboration & quality</i>	Profesional training in Oil and Gas	MoU with industry such as CGT Petroleum, SBM Offshore Malaysia, JTS Prima & Caliph Group Technology
<i>Management Monitoring</i>	PDP Report, Lecturer Portfolio	Class observation and reporting
<i>Skills & Techno creations</i>	Commercial project development	Wireless fluid tank monitor project
<i>Innovation initiatives</i>	Competition organized and participation	Offshore structure modelling competition, Innovation and invention competition through exhibition,
<i>Curriculum development</i>	Written Instructional Material (WIM)	Syllabus development
<i>ICT initiatives</i>	Systems IT based development	College management system, facilities booking system
<i>Social initiatives</i>	Training and workshop organized	Basic 3D AutoCAD Training, AVEVA PDMS Training
<i>New business initiatives</i>	New product development	AUTO Smart PCB, PSME Course,

Based on the table above, knowledge creation occurs every year because of these achievements are evaluated annually and reported as many as four times a year. Details of this achievement is a report that is required as proof for the reporting of results, and revision of standards and quality. However, the findings from this study show that available tacit knowledge among staff who developed the product, innovation, training and workshop is not capture.

Thus, the existing of knowledge creation requires knowledge harvesting implementation to ensure that knowledge can be documented and packaged so that knowledge can be reused when needed and for future references. It is a process of tacit to explicit knowledge as well as capturing tacit knowledge.

4.2.2.3 Challenges and Difficulties Experienced

Based on the study, found that a challenges and difficulties experienced in this institution in managing knowledge. Although the concept of KM has been no disclosure in these institutions, but the nature of the institution as an education center, then knowledge management already exist indirectly. However, a number of challenges and difficulties faced found through interview, survey and document review.

Table 9:
Challenges and difficulties experience

Challenges and difficulties experiences				
Fragmented system	Academic change	Staff change	Managing duplication	Culture
<ul style="list-style-type: none"> - Not centralized database - Different scope of record are in different system - Doesn't have KM system - Lack of appropriate technology 	<ul style="list-style-type: none"> - Curriculum restructuring - Student-centric focus 	<ul style="list-style-type: none"> - New recruitment - Retention - Left institution 	<ul style="list-style-type: none"> - Staff records duplication - Untraceable records 	<ul style="list-style-type: none"> - Lack of understanding and awareness - Lack of time by employees for knowledge management activities - Organizational culture is not encourage knowledge sharing - Lack of commitment from senior management

Through studies conducted some challenges and difficulties this has been a factor in the failure of the implementation of knowledge management. Based on interviews with the top management, knowledge sharing recognized beneficial to the institution, but due to lack of awareness, procedures, planning and implementation framework, then this activity failed to run.

For the purpose of this study, the fact challenges and difficulties experiences will be discuss in the next chapter for discussion and recommendations.

5.0 Discussion & Recommendations

Relevant data resulted from the case study is the discovery of the method of interview, survey and document review. It is a loss to the institution where knowledge creation has already happened but no proper method to manage knowledge. Therefore, knowledge creation is not able to maximize the benefits to the institution.

Various issues that arose during the study that has prompted the authors to put forward the following proposals which it deems to strengthen knowledge management practices in a systematic and orderly manner in the individual level and the institution as a whole.

5.1 The Nature of Knowledge Creation Identification.

The nature of knowledge creation has been identified. Therefore, to develop the concept of knowledge management, institution are proposed to identify KM process to ensure knowledge creation and requirements as well as the knowledge location, storage and format.

Nonaka and Takeuchi (1995) mentioned that knowledge generated only in people's mind, and it is very complex. Even the knowledge can be stored and located, the problem of determining who needs, what knowledge and when is difficult to determine. At this point, it is very important to the institutions to develop KM processes. This can be implementing through identification of needs for knowledge and store the knowledge that can be then access.

Nonaka also introduced four modes of knowledge creation known as SECI Model, which is socialization (conversation tacit to tacit knowledge through social interactions and shared experiences), combination (creating new knowledge by merging, categorizing and

synthesizing existing explicit knowledge), externalization (converting tacit knowledge into explicit knowledge) and internalization (creating new tacit knowledge from explicit knowledge).

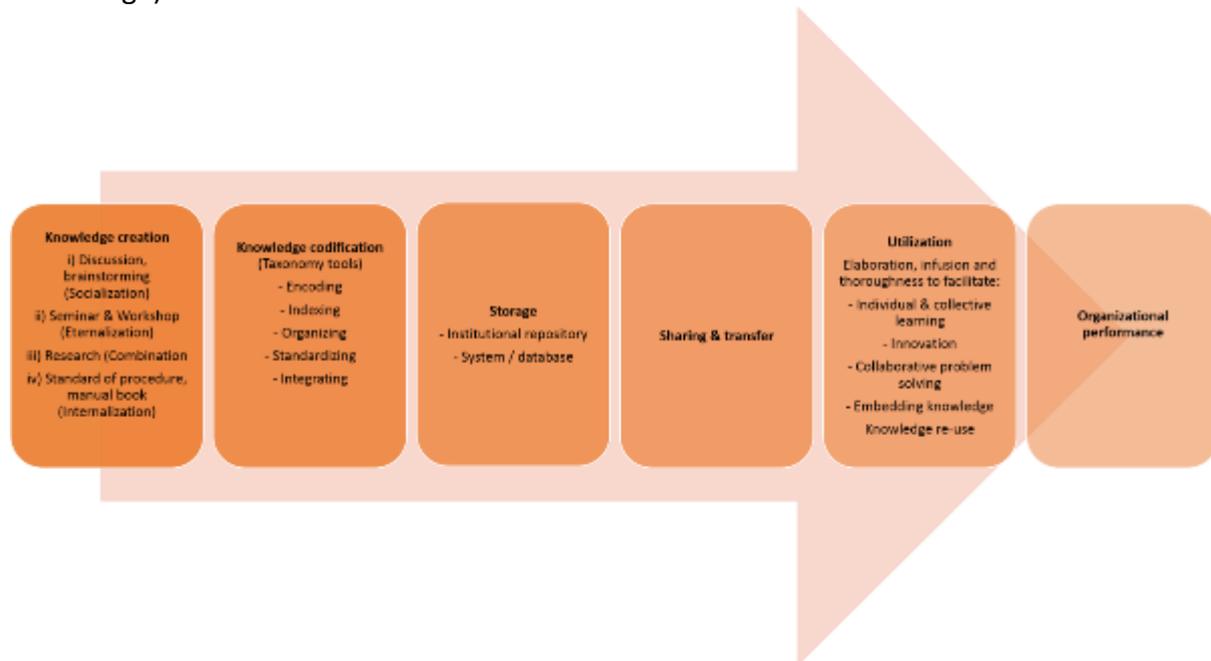


Figure 1: KM process model

Through the process of knowledge creation using SECI model, identified the nature of knowledge in this institution. Moreover, based on the KM process, institutions are able to identify which stem from the creation of knowledge and how the method can be used to ensure that knowledge can be managed and organized for accessible purpose when needed. However, not all knowledge that is created needs to be managed. Therefore, the proposed framework of knowledge harvesting is propose to ensure that institutions are able to identify whether critical knowledge that need to be managed which knowledge has value to the organization.

Taxonomy is one of knowledge management tools intended to make the process of encoding, indexing, organizing, standardizing and integrating knowledge in order to reuse knowledge in future. For example, staff with expertise in the field of firefighting's specifically in procedures and techniques of safety are in Piping Program Department. It is classify as safety, which is sub topic on procedures and technique

The utilization of the knowledge will facilitating the individual and collective learning, innovation ideas creation, collaborative problem solving, embedding knowledge to enhanced skill and competency; and re-use the knowledge. This process effectively enhance the organizational performance.

5.2 Knowledge Harvesting Framework

Institution need to develop a strategy and framework outlined by the vision, goals and objectives of knowledge management for capturing tacit knowledge which is leverage knowledge creation in the institution. Through a more focused approach and systematic knowledge management, institution will;

- i) Facilitate the sharing of knowledge among staff,
- ii) To identify process to embed knowledge such as mapping knowledge flows, identify best practices and promoting innovation
- iii) Effectively utilize existing technology for knowledge sharing and collaboration purpose

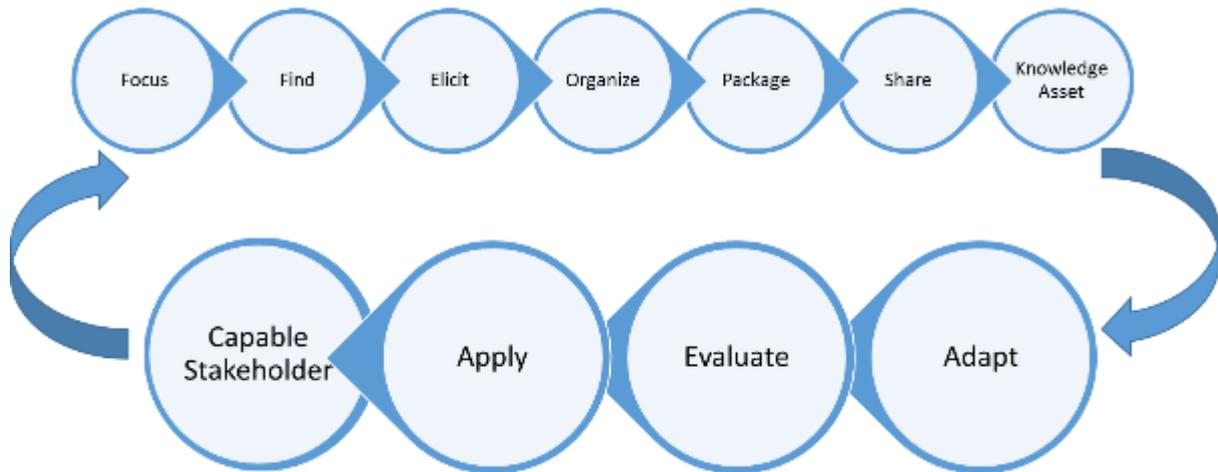


Figure 2: Knowledge harvesting framework

In the literature review has been explained the process and approach of knowledge harvesting. Figure 9 showing the knowledge harvesting framework that consists of knowledge harvesting approach, knowledge asset and capable stakeholders.

Knowledge assets in this framework is referring to the guidance and support information that owned by the organization which enhanced stakeholders ability to accomplish important work via the process of knowledge harvesting. The characteristics of knowledge assets is should be codified human expertise such as institution main process and strategy, owned by the institution and exist independently of human memory. The knowledge asset will promote understanding, provide guidance for action, and create new knowledge as well as support learning at the speed change. Knowledge asset will created through knowledge harvesting process and approaches use in the institution.

Knowledge harvesting is a mature methodology for rapidly converting top-performer expertise into knowledge assets that improve the institution's performance. Knowledge will be protected from degradation due to personnel losses, employee defections and unavailability of expertise when needed. Knowledge assets also contribute to corporate competitiveness, profitability and valuation. It is because, employed knowledge harvesting as an approach for eliciting and organizing vital know-how.

Table 10 :
Knowledge harvesting process

Knowledge Harvesting Process	
Process step	Explanation
Focus	To determine the existing explicit and tacit knowledge needed for the focal process. This step can be happen through socialization, externalization, internalization and combination process (SECI Model) that has been explained in this study.
Finding	To identify expertise that performing their critical activities. Survey and document review on the job description is an appropriate method to implementing this process.
Elicited	To obtain and capture critical activities/ knowledge from expertise through interview that are conducted by knowledge harvester.
Package	To package the knowledge in the form of accessible to the staff in the institutions such as in the form of document, CD, DVD and online storage.
Sharing	To distribute the knowledge throughout institution and to the person who are request that knowledge. Sharing process can be implementing by using KM tools such as mentoring, storytelling and communities of practices (CoP).
Apply	To allow staff using the knowledge that has been gained and stored. KM systems function as an enabler to facilitate users apply the new knowledge.
Evaluation	To determine the effectives of the applications. Knowledge audit is one of the method to evaluate the relevancy, efficiency, effectiveness, sustainability and impact to the institution.
Adapt	Able to adapt new knowledge. Facilitating and empowering the instances of learning to ensure critical knowledge and knowledge asset continually developed.

According to knowledge harvesting framework, the process of knowledge harvesting has been explained in a Table 7 that congruent with the institution implementation. This process can assist institution in their effort to harvest and preserve knowledge asset as well as essential knowledge surrounding the organization’s key processes.

5.3 Improve Knowledge Sharing Culture using KM Tools

Based on findings, sharing culture is already exist in this institution. Therefore, the institution are proposed to improve knowledge sharing culture to ensure existing knowledge creation is valuable and ultimately benefits to the institution. Three effective KM tools are appropriate to the nature of knowledge and institutions characteristics that can be implement to capture employee's tacit knowledge. These three ways of capturing tacit knowledge have been proven and implemented at Jabatan Kerja Raya (JKR) Malaysia and Bank Negara Malaysia (BNM).



Figure 3: Effective ways to capture employee’s tacit knowledge

5.3.1 Mentoring

Supportive relationship where a more experienced and expert's staff undertaken to support and guide a less experienced staff in building knowledge and skills related to their work area. This kind of KM tools is an inexpensive, relatively easy to adopt and potentially improve morale and productivity.

Mentoring program can be implementing in both either formal and informal. Informal mentoring involve assigning a guide to a new staff or encouraging seeking for mentor to get a skills or knowledge. However, formal relationships is much more effective.

Based on Clutterbuck (2001) and Heathfield (2011) mentioned a few characteristics for an ideal mentor which are having a personal expertise, experts in the procedure and work process, desire to guide and teaching, ability to motivate, ability to allow for personal development of the mentee, commitment in terms of time, resources and persistence, skilled communicator, ability to remain professional and ability to foster trust.

5.3.2 Communities of Practice (CoP)

Consists of group of people who share a set of problems or passion about topic, and who deepen their knowledge and experience in that area by interacting an on-going basis. It will foster trust and a sense of common purpose and add value to profesional lives of members. Michael Behounek, Director of Knowledge Management at Halliburton said that by helping to build these communities, we are not only realizing huge improvements, but also proving employees with a greater access to one of the most valuable learning resources interaction with peers.

Technology as an enabler of KM to implement communities of practice in the institutions. By defining and identifying a good platform and channel that staff can convey their problem, idea, skills and suggestion towards a certain issue and cases, this will enable capturing tacit knowledge and converted into explicit knowledge which is manual, procedure and guidance in conducting the repeatable issue and/or creating new knowledge.

5.3.3 Storytelling

This tool is using stories as communication tool to share knowledge in everyday language as opposed to "textbook buzzword"; a narrative form that people find interesting and fun. This will create memorable learning experiences and helps to clearly communicated complicated ideas. Steve Denning, Program Director of Knowledge Management at World Bank mentioned that storytelling relinquishes a straightforward journey from A to B, and in the end provides a vehicle for conveying unseen tacit knowledge.

Storytelling functions as a wisdom repository and is instrumental in the creation of the new knowledge. This method is similar to the concept introduced by Nonaka in SECI Model, which is externalization process in which tacit knowledge to explicit knowledge.

Stories can be used to shape vision, to transfer knowledge and wisdom and to shape identity and organizational culture. Storytelling is considered one of the most effective techniques and influences, and has been widely documented in various fields. Sole and Wilson (2002) identify the role of storytelling as share norms and values, develop trust and commitment, share tacit knowledge, facilitate unlearning and generate emotional connection.

6.0 Conclusion

This study using real-world case study, therefore limited to the perspective of only one institution. However, the proposed framework and model is developed based on case studies

carried out in other organizations. Future research should be provided with a solid foundation for assessing the effectiveness, reliability and suitability of the methodology to this institution, which concern to the institution's empowering and Return of Investment (ROI) orientation to the institution as a whole.

The main objective of this study was to identify the knowledge that already emerge in the institution to be manage with systematically procedure so that knowledge can be used to staff and the institution as a whole which will ultimately impact to the institution performance. For future research, knowledge creation report may be required prior to implementation of knowledge management is seen as a valuable and profitable to the institutions.

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