Implementing Knowledge Transfer Solution through Web-based Help Desk System

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Abstract—Knowledge management is a process taking any steps that needed to get the most out of available knowledge resources. KM involved several steps; capturing the knowledge discovering new knowledge, sharing the knowledge and applied the knowledge in the decision making process. In applying the knowledge, it is not necessary for the individual that use the knowledge to comprehend it as long as the available knowledge is used in guiding the decision making and actions. When an expert is called and he provides step-by-step procedure on how to solve the problems to the caller, the expert is transferring the knowledge or giving direction to the caller. And the caller is 'applying' the knowledge by following the instructions given by the expert. An appropriate mechanism is needed to ensure effective knowledge transfer which in this case is by telephone or email. The problem with email and telephone is that the knowledge is not fully circulated and disseminated to all users. In this paper, with related experience of local university Help Desk, it is proposed the usage of Information Technology (IT)to effectively support the knowledge transfer in the organization. The issues covered include the existing knowledge, the related works, the methodology used in defining the knowledge management requirements as well the overview of the prototype.

Keywords—Knowledge Management, Knowledge Transfer, Help Desk, Web-based system.

I. INTRODUCTION

A user is facing a problem with his PC. Unable to fix it by himself, he calls up the computer Help Desk to seek assistance. By helping the user, Help Desk is actually 'selling' knowledge to the caller. And the 'product' is primarily the knowledge. Various kind knowledge – answer of FAQ's, routine, best practices, tips, procedures etc – are scattered and reside in the heads of the support staff. It is extremely valuable resource which worth thousands of dollars [1] and this 'product' is the one that keeps the Help Desk 'in business'.

As time goes by, the nature of problems from the users become more complex and broader. As a hub in providing technical supports and other services, the support staff is no longer capable to 'store' the necessary knowledge in their heads. There is a necessity to 'keep' this knowledge somewhere so that it can be retrieved whenever it is needed especially when solving the problem.

Knowledge is defined as 'information in use'. The knowledge is exists because of the existence of information. With good information which the in convert to knowledge, people can make better decisions and take intelligent actions from it [2].Knowledge Management (KM) is a process of organizing and analyzing information to make it understandable form and applicable to problem solving or decision making. [3]. It's processes involved from the discovery of the knowledge, capturing the knowledge, sharing the knowledge and application of the knowledge.

Knowledge Management (KM) is defined as a process of organizing and analyzing information to make it understandable form and applicable to be used in problem solving and decision making [3]. While Knowledge Transfer (KT) is a part of the KM process it self. The KT is defined as the transmission of knowledge from one individual to another or simply from the document to the other individual [4]. And the transmitted knowledge can be used in order to make better decisions, streamline processes, reduce rework, reduce cost of operations and improved customer services. [5]. For instance, when an expert response and guide a novice user through a procedure, the expert is actually 'direct' the user or in other words is 'transferring' the knowledge to the user.[6]. And in this case, the transmitted knowledge being used to improve their work activities and efficiently improve their business process.

KT process can happen between an individual to other individual (tacit knowledge transfer) and also from the document or system to the other individual (explicit knowledge transfer). Unlike to knowledge sharing, knowledge can be transferred from an expert to the novice user when the novice user is having problem. It means, no actual transfer or exchange of knowledge between the concerned individuals [6]. The knowledge being transfer is without transferring to that person the knowledge underlying the direction which means, the experts can preserves the advantages of the specialization and avoids the difficulties inherent in the transfer of the knowledge [6].

In this paper, we are focusing on transferring the explicit knowledge throughout the organization. In order to effectively transfer the knowledge to the users, ICT is used as the medium of communication. ICT makes the knowledge capture, shared and transferred easily where it allows the knowledge to be accessible to the users anywhere and anytime when the users need it [7]. The table below represents our view of how knowledge transfer can took place in the organization.

Effective knowledge transfer strategies rely on the capacity of institutions to shape their knowledge transfer approaches and activities in partnership with their various communities, and to respond creatively to the distinctive needs of those communities [12]. From this perspective, a complete Help Desk System of Knowledge Transfer is created which demonstrated considerable diversity in knowledge transfer

approaches and activities, both within and across institutions and across disciplines and national research priorities.

For this project, our focus is only on the action of knowledge transfer. After considering the business process and views of stakeholders, however, we have formed the view that includes the transfer of knowledge which we think important according to our assumptions and research. We suggested that consideration is to be given to the aspects of knowledge transfer that are linked to the university's objectives and possible inclusion in future knowledge transfer policy frameworks which is shown in Fig. 1 and Fig. 2 respectively.
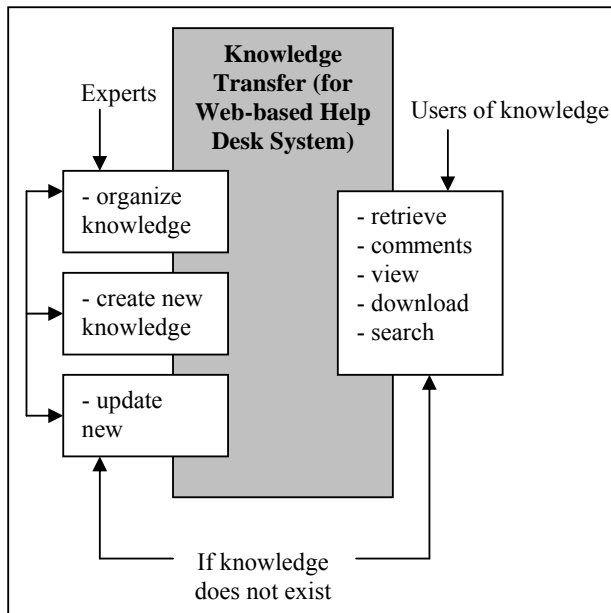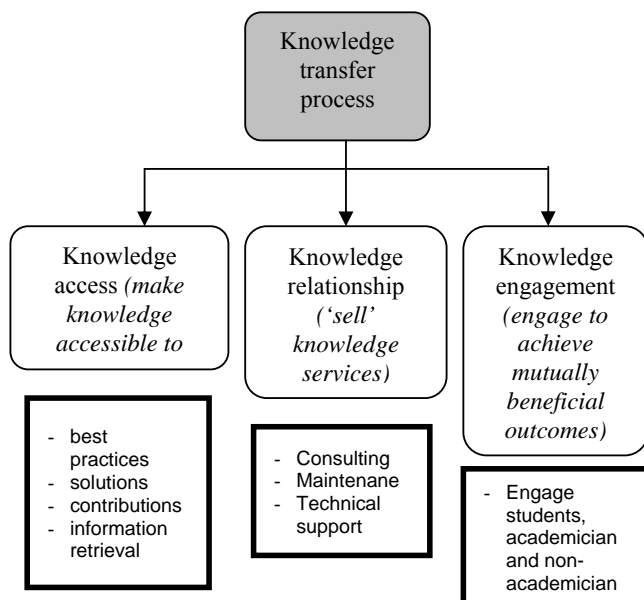

Fig. 1 Knowledge Transfer Conceptual Framework

Fig. 2 Knowledge transfer scope

This paper will relate the experience of a local university Help Desk in Malaysia. This paper will discuss the transformation of a small group of talented support staff to a centralized knowledge transfer system with particular needs. The rest of the paper is organized as follows: section II presents the analysis done in this study to define the system requirements; section III is to explain the characteristics of the prototype; section IV is the implementation and lastly the conclusion and recommendation.

II. RELATED WORKS

The Web-base Help Desk System (WHDS) will be used as a new means of knowledge transfer in the organization by the Help Desk unit. The main rationale of the system will remains the same where it will still be the centre of technical support and services however in more systematic and more manageable manner. On top of that, the proposed system is developed by using the ICT as the enabler of the KM system.

Based on research done by ASTHO, they pointed out that the knowledge management system should have the ability to ensure the availability to access and use the information in a timely manner. This uses technology to support the knowledge component such as in many public health agencies where currently they are developing systems for better understanding, manage and use their existing information. [3]

Rubenstein-Montano suggested that knowledge management framework is classified in three categories: descriptive, prescriptive and hybrid. Prescriptive frameworks provide direction of the types of knowledge management procedures without providing specific details of how the procedures should be carried out [2]. Means instead of novice users need to understand the relying or specializing concept, he only needs to follow the instructions to get the job done.

Research done by Kimberly Lopez suggested that the KM can get enormous benefit from the ICT revolution. She suggested the importance of making connections between people to people and between people to information is the driving force to use ICT in KM initiatives. [2]

Besides that, the University of Duquesne had also implementing KM for their Help Desk unit. Previously the talented supported staff is solving the problems with their own small set of favorite tools however now the Help Desk is growing to become a large centralized high-quality tools for a particular needs [11].

III. ANALYSIS OF THE ORGANIZATIONAL REQUIREMENTS

A. Methodology of Study

The analysis of the organizations' knowledge management and their current practice is conducted by using observation, questionnaires, and individual interview session with support staff and management. The idea of involving the users is to ensure that the system is going to solve the right problem at the right time. This can be achieved only by studying people practices [6]. The focus is mainly on the observation of the current practices and the working environment in the

organization to determine the knowledge management need in the organization.

Different tools and methods are used to capture the information in different steps of investigation:

- observation of current practices of the support staff
- informal interview sessions
- observation of the existing system
- Interview with the management
- Questionnaires

Observation of current practice – to fully understand the procedures carried by the support staff while they are assisting users in problem solving. It is also to find the best mechanism to transfer the knowledge from the expert to the users as well ass to observe the working environment adopted in the Help Desk unit.

Informal interview sessions – to determine the knowledge management requirements in the organization

Observation of the current system – to investigate on how improvements or enhancement can be implemented in the existing system.

Interview with the management – to define and understands the objectives, policies of the organization

Questionnaires – to investigate on the effectiveness of the current system and to investigate the level of productiveness in the current system.

Based on the analysis, the following problems need to be addressed when designing the WHDS:

- *scattered knowledge* – based on the observation of the current practice, knowledge base documents are not fully utilized by the Help Desk staff. When the support staff forgot on how to do something, they will refer to documents or manual or particular person. However the activity of flipping through manual or procedures to find pages containing the needed information is too hassle and time consuming
- *effective knowledge transfer-* the knowledge is not circulate effectively in the current system. Current system is using telephone as a main method of communication when user is facing problem with their PC. The problem is the information is not well disseminate in the organization whereby the information is only given to the caller but not the rest of the organization. Another method used is by using email. Then again the problem arisen when the information need to disseminate repetitively and not throughout the organization.
- *Reusable of knowledge* – when the expert's knowledge is codified, it encourage the idea of knowledge discovery. The codifying is important as the knowledge is important to be preserved as well as the work of the support staff is being redundant. Furthermore is is important to make the expertise always available as more junior staff is recruited hence by having a knowledge management system can shorten the learning curve.[6]
- *Minimization of information* – effective knowledge management solutions are not about large collections

of searchable documents [9]. Knowledge is a minimization of information gathering and reading but not to increase access to information. Effective knowledge helps user to eliminate or avoid what user do not want [9]
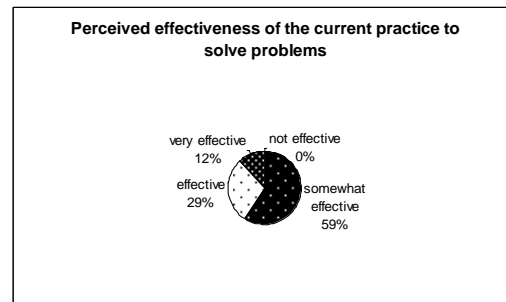
IV. RESULTS AND DISCUSSION

Fig. 3 Perceived effectiveness of the current practice

Fig. 3 illustrates the effectiveness of the current method in guiding users during problems solving. The current system is using the telephone, email and even paper-based form as mode of knowledge transfer. Based on the survey, 59% responded agreed that the current practice is not the best method in guiding them in problem solving. Based on this result, an appropriate mode of knowledge transfer is needed to be implemented so that knowledge can be fully circulated and distributed in the organization.
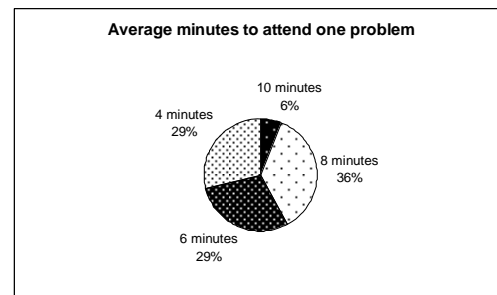
Fig. 4 Average time spent (in minutes) in solving a problem

Whereas Fig. 4 shows generally 8 minutes are spent to assist the user to solve their problem. Based on the Help Desk report, average of 30 complaints is made per day. It means on average 4 hours are spent daily just to assist the callers on their problems. From this result, it is clearly showed that the current system do not increase the productivity of the talented support staff. An alternative mechanism that centralizes the knowledge from the support staff need to be implemented to reduce the time in attending the problems as well as to eliminate the re-work of the procedure.

V. OVERVIEW OF THE SYSTEM
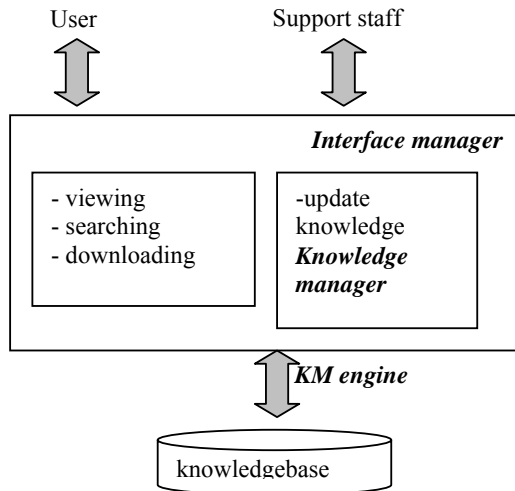
A. Implementation

Fig. 5 The WHDS system architecture

The WHDS system architecture is illustrated in Fig. 5. It is composed of two main modules: interface managers that responsible for presentation and interaction; knowledge managers whose tasks are defining, updating, maintaining, indexing and searching the knowledge; and knowledge base for archiving

i. Interface Manager

Users access the systems through the interface manager which provides the knowledge presentation and navigation facilities. Users are allowed to view, search and download the contents from their personal computer. Interface manager depends on KM engine to retrieve and organize knowledge displayed on the screen. Interface manager direct or transfer the knowledge to the user to solve problem, based on the suggested knowledge resides in the knowledge base.

ii. KM Engine

KM engine is devoted to capture and maintaining the knowledge. It examines the contents of the knowledge base and the input gathered from the problem and retrieved the knowledge to derive the conclusions or answer the questions asked. The KM engine also responsible to update, organize and search the requested knowledge from the user. The knowledge is searched by using the SQL statement in the knowledge base. KM engine is also responsible to discover new knowledge when there are any updates done by the support staff in the knowledge base.

iii. Knowledge Base

Valuable knowledge that has been captured is kept in the knowledge base. It contains entire relevant knowledge gathered from the experts from various sources. The knowledge is represented as functional knowledge to solve the problems.
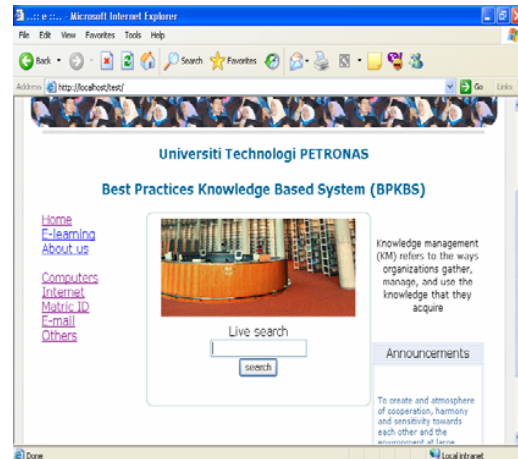

Fig. 6 The WHDS interface

VI. CONCLUSIONS AND RECOMMENDATIONS

In this paper, the main feature of Web-based Help Desk System (WHDS) is described. Such features implemented are a proposal to solve the problems that have been analyzed in defining the user's knowledge management requirements in the local university. This paper also showed how knowledge transfer can be applied in the organization by implementing system which required a combination of web-based interfaces and knowledge retrieval techniques.

The development of the WHDS allows the reuse of the knowledge in the organization which is to eliminate rework or repetitiveness when the same problem occurs. Indirectly it helps the organization to increase their support staff productivity level as well as level of efficiency. The WHDS is also as an alternative platform for effective knowledge transfer in the organization. Effective transfer and dissemination of knowledge in the organization may reduce the cost of operations and improved the customer services.

V. RECOMMENDATIONS

For future enhancements, it is suggested that the implemented prototype to include the automatic knowledge capture; not only on explicit knowledge but it is extended to capturing the tacit knowledge as well.

Additional to that feature, it is also suggested that the implemented system to have knowledge discovery functions where the users are allow adding and at the same time to create new knowledge on the existing knowledge resides in the knowledge base.

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