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TOWARDS AN ESSENTIAL KNOWLEDGE TRANSFER PROCESS MODEL IN THE FLOOD MANAGEMENT DOMAIN

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ABSTRACT

The study of knowledge transfer is becoming important in many areas such as small-medium enterprises, higher education, health management and disaster management. Our study focuses on the process of knowledge transfer in the flood management domain in Malaysia. Currently, there is a lack of standard practice in terms of transferring knowledge between entities in this domain. Thus, based on a review of the literature, we propose the conceptual model of a knowledge transfer process in the flood management domain. The proposed model is a preliminary work which will be evaluated in the next phase.

Keywords: knowledge transfer, knowledge transfer model, flood management.

INTRODUCTION

Knowledge management systems (KMS) have been extensively used in many fields including business, IT outsourcing, higher learning institutions, health management, disaster management and many others. This is due to the ability of KMS to manage organisational knowledge effectively. According to (Alavi & Leidner 2001), a KMS is a system that can support the process of knowledge creation, storage/retrieval, transfer and application in an organisation.

Knowledge transfer is one of the important components of KMS (Alavi et al. 2006). Knowledge transfer is important due to its ability to facilitate communication effectively between different parties. According to (Albino et al. 1999), knowledge transfer is a critical factor if a firm is to respond quickly to any changes and become competitive. The process of knowledge transfer can be divided into two types: between organisations (inter-organisation), and within an organisation (intra-organisation). This paper discusses the inter-organisation knowledge transfer process in the flood management domain in Malaysia.

Floods are a common natural disaster in Malaysia and have caused severe damage in terms of human lives and economics. In fact, the estimated loss due to flood is MYR1 billion annually in Malaysia (Othman et al. 2014). Flood management in Malaysia is a complex process due to the involvement of multiple agencies in coordinating the response to the event. The agencies involved are the National Security Council (MKN), Public Works Department, Department of Irrigation and Drainage, Department of Social Welfare, Royal Malaysia Police, Civil Defence Department, Fire and Rescue Department, Meteorological Department and Tenaga Nasional Berhad (Katuk et al. 2009), (Yahya et al. 2014). Due to the involvement of many agencies during flood occurrences, the process of flood management becomes complex since floods may occur across borders which will make it difficult to manage (Othman et al. 2014).

To improve the flood management process, a repository that can pool the knowledge together is very helpful in solving the coordination problem. Apart from that, having one repository that is used by all agencies will allow the sharing of knowledge among the agencies involved. This will improve the decision-making process since each agency may provide the latest information, while at the same time obtaining the most recent information from others. However, collecting and storing the knowledge in one repository involves the very challenging process of transferring knowledge from the agencies to the core agency which, in this case, is the MKN. The disaster management procedure in Malaysia gives the authority to the MKN to make decisions based on input from related agencies. Therefore, based on the direction of knowledge transfer from multiple agencies to the core authority, we propose a star topology network as the most suitable architecture for the knowledge transfer. In this architecture, the multiple agencies will provide information to the MKN which acts as a hub. Figure-1 shows the architecture of our proposed knowledge transfer process in the flood management domain in Malaysia.

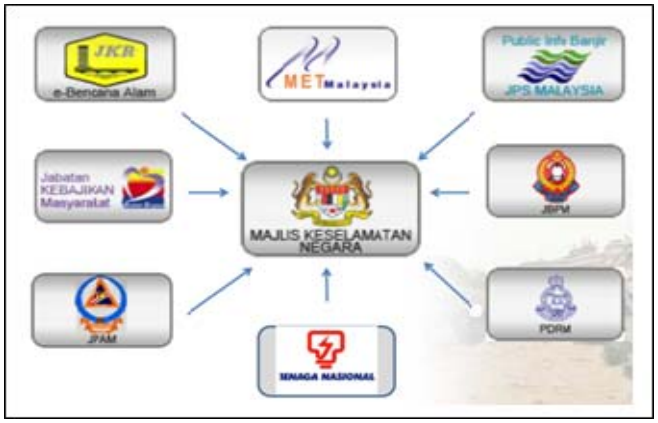

Figure-1. Agencies involved in flood management in Malaysia.

This paper is organised as follows: the background on knowledge transfer is presented in Section 2. The development of the knowledge transfer model is presented in Section 3. Section 4 discusses the proposed model and Section 5 concludes this paper.

KNOWLEDGE TRANSFER

Knowledge transfer as a process

Knowledge transfer is the process of transmitting information from a sender to a receiver. The sender and receiver can be an individual, a group or an organisation (Liyanage et al. 2009). A knowledge transfer is considered successful when a receiver is able to use and apply the knowledge effectively.

Previously, many researchers looked at knowledge transfer as a process that is used to send information from one entity to another. This transfer is treated as a black box which is initiated by a sender and received by a receiver. However, more recent studies have started to look at the essential processes that occur during the knowledge transfer process specifically and during the knowledge management process in general. For example, in a study by (Zuhaili et al. 2014), the essential processes of knowledge integration were defined as identification, creation, assimilation and evaluation. The essential process was introduced by Dietz in relation to business process modelling (Dietz 2003). The notion of the "essential business process" is also well discussed in (Dietz & Albani 2005), (Dietz 2006) and (Dietz 1999). In the knowledge transfer process, researchers have started to look at the sequence of events that occur in order to gather insights into the nature of the inner workings of knowledge transfer.

Knowledge transfer model

Many knowledge transfer models have been developed by researchers. We studied 10 different knowledge transfer models in different domains developed from 1996 to 2014, as shown in Table-1 below. This table summarises the processes identified in the knowledge transfer models. From these 10 models, we found 23 possible essential processes that take place during the transfer process.

Table-1. Summary of knowledge transfer models in the literature.

Authors	Identification	Filtration	Awareness	Acquisition	Transformation /Conversion	Association	Application	Feedback	Protection	Communication	Acceptance	Assimilation	Initiation	Implementation	Ramp-up	Integration	Motivation	Matching	Retention	Routing	Dissemination	Search	Transfer
(Gilbert & Cordey-Hayes 1996)				√			√			√	√	√											
(Hansen 1999)																						√	√
(Albino et al. 1999)				√			√			√	√	√											
(Szulanski 2000)													√	√	√	√							
(Kwan & Cheung 2006)														√			√	√	√				
(Laframboise et al. 2007)				√	√		√		√														
(Narteh 2008)					√		√													√	√		
(Liyanage et al. 2009)			√	√	√	√	√	√															
(Hashim & Ahmad 2013)					√		√						√	√	√	√	√	√	√	√	√		
(Yahya et al. 2014)	√	√		√	√		√	√													√		

Based on the table, we found that the most common processes included in the knowledge transfer models are acquisition, transformation, application, implementation and dissemination. These processes are identified based on the frequency of each process found in different models.

DEVELOPMENT OF KNOWLEDGE TRANSFER MODEL

Knowledge transfer models have been studied by many researchers. However, our study is one of the first to identify the essential processes that occur during knowledge transfer in the flood management domain in Malaysia. Based on the identified processes, we developed a conceptual model of the knowledge transfer process.

Initial development of conceptual model for knowledge transfer in flood management domain

A conceptual model for knowledge transfer was developed in our previous work to represent the essential processes of knowledge transfer, as shown in Figure-2 (Yahya et al. 2014). The transfer is between multiple agencies and the MKN in the flood management domain in Malaysia. This model assumes that only explicit knowledge is transferred. The agencies act as initiators that start the transfer process, and the MKN acts as a receiver that will use the knowledge. The essential processes in this model are identification, transformation, filtering, dissemination, acquisition, application and feedback. We assumed that agencies will first have to identify the information they want to send. The information then needs to be transformed or converted into common keywords understood by other agencies. These keywords are then filtered to ensure only relevant information will be sent. The filtered information is then disseminated to the receiver through a proper channel. On the other hand, the receiver will later acquire the information and apply or use it. Any feedback from the MKN will be transferred back to the agencies.

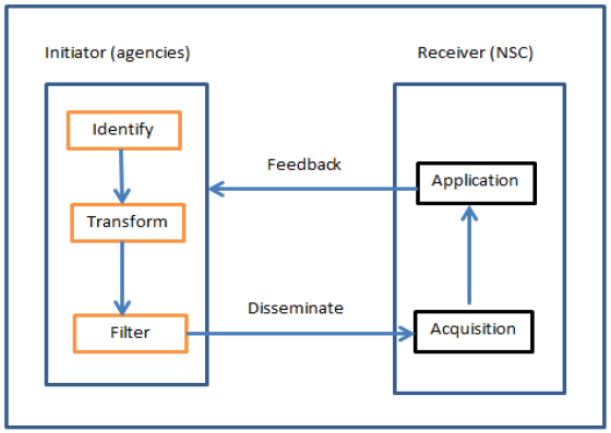

Figure-2. Conceptual knowledge transfer model (Yahya et al. 2014).

However, after several reviews, we noticed that some processes are not needed during the knowledge transfer. For example, *identify* process is not needed since it is done during knowledge acquisition which is part of knowledge management process. Similarly, *application* process is done during knowledge application which is also part of knowledge management process. In our research, we only focus on the process that occur during the transfer. Thus, since only tasks that involve during the transfer will be identified, we have come up with a revised version of our model.

A revised conceptual model for knowledge transfer in the flood management domain

From the literature review, as summarised above in Table-1, we identified four processes that could be seen as the essence of knowledge transfer, namely, Acquisition, Conversion, Implementation and Storage (ACIS). These identified processes were used to develop a revised conceptual model of knowledge transfer in the flood management domain. Figure-3 depicts the new model of knowledge transfer in the flood management domain.

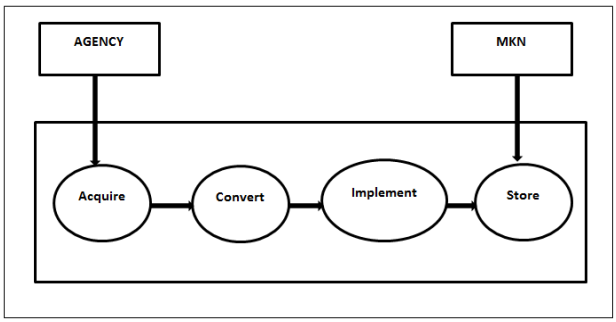

Figure-3. Essential process of knowledge transfer.

The model starts with the agency initiating a transfer process to the MKN which is the core authority in the flood management domain in Malaysia. Each transfer starts with the acquisition process which the sender needs to do. The sender must acquire knowledge to be sent to the receiver. The success of this process depends on the speed of getting the information (Liyanage et al. 2009). Once the knowledge has been acquired, it needs to be converted into a common knowledge understood by the receiver. This is necessary to ensure that the transferred knowledge will be useful to the receiver and will meet the receiver's requirements. Once the information has been converted, the implementation process which is the actual transfer of information will be done through a proper channel. The receiver will receive the information and store the information accordingly.

DISCUSSIONS

The essential processes of knowledge transfer proposed in this paper are expected to enhance the current process of knowledge transfer between agencies to the MKN before or during the occurrence of flood. The essential processes will be used as common processes by all agencies to transfer knowledge to the central authority based on the star topology architecture. In this section, we explain why the four components were chosen as the essential processes in knowledge transfer.

Acquisition

The acquisition process was chosen because it is the process of acquiring knowledge by the agencies. It is assumed that the required knowledge has been identified earlier by the agencies and only selected knowledge will be acquired. It is important to get up-to-date data so that the transferred knowledge will be the most recent knowledge to be used by other agencies. According to (Laframboise et al. 2007), an ability to obtain knowledge from external parties is part of the knowledge acquisition

process. It is difficult to have successful knowledge transfer if this process is omitted (Laframboise et al. 2007), (Byrd et al. 1992). Thus, we include the process of acquire in our model as a starting process in this model.

Conversion

The conversion, or transformation, process is one of the most important processes in knowledge transfer. This process is important especially if different systems need to interoperate with each other. Appropriate knowledge conversion mechanism must be used in order to get a standard and common vocabularies for the agencies. This process is important as mentioned by Calabrese cited in (Laframboise et al. 2007) who states that this process is needed in order to make the knowledge accessible to other members for collaboration.

During heavy rainfall for example, related websites normally display the current information about the condition. In some websites, the term *warning* is used when the water level reach a certain danger level. In another website, the term used is *alert* in order to convey the same meaning. Thus, these two similar terms need to be standardized in order for two different systems to interoperate. Thus, this scenario justify the needs of conversion process in our model.

Implementation

The implementation process is the actual process of sending knowledge from the agencies to MKN. This process is done through a system. We assume that an appropriate channel is in place and is in good working order, thus, the transferred knowledge can be transferred easily. Therefore, this process is also included as one of the essential processes in our model.

Storage

Storage is the last essential process identified in this study. Storing the knowledge is important so that it can be retrieved easily by other parties. Before the storing process, knowledge needs to be organised properly so that it will be stored in the right place with the right interpretation.

CONCLUSIONS

The main objective of this paper is to identify the essential processes of knowledge transfer in the flood management domain. This is one of the first studies to thoroughly investigate the possible steps involved in the knowledge transfer process between agencies and MKN in this domain. Based on this research, a common protocol may be introduced for the agencies to follow during the transfer of flood-related information. Thus, in our next research, we will evaluate the proposed model based on a case study setting and present the results accordingly.

Our expection is that when all agencies follow the same procedures and standards in transferring information, the problems of not getting information at the right time and not getting sufficient information will be solved. This is because all agencies will share the same repository which will lead to better collaboration and knowledge sharing among agencies. Thus, decision-making can be done quickly and accurately by MKN.

However, we also would like to point out that the success of the knowledge transfer process also depends on other factors such as infrastructure, technology, up-to-date data and the willingness of the agencies to share data. Ensuring all these factors are in place will enhance the success of this model.

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