Abstract — In the knowledge management field, knowledge sharing is considered as a very important activity in order for the organization to make decision related to their day-to-day and complicated tasks. Working with different organizations that have different beliefs, culture and work flow will make the knowledge sharing more complex thus identifying the influencing elements for the organizations to share their knowledge is important. These elements are important as they are related to the next investigation on inter-organization knowledge sharing, and will be used in developing our research framework. Interviews were carried out among the departments that are involved in the flood management. This paper shows how data based on the interview done from 19 respondents from the flood management domain is analyzed. It details out on how thematic analysis is used as a method for identifying, analyzing and reporting patterns (themes) within data. With its characteristics of being flexible and useful research tool, thematic analysis provides a rich and detailed account of the voice data and uncover new theme. Three perspectives gathered from the literature reviews being technology, management and political and policy were used as theoretical framework. The Straussian approach was used in analyzing the qualitative data. The results shows the emerging themes that were identified while coding the data being technology, organizational, political and policy and coordination.

Keywords – knowledge sharing elements, inter-organizations, analytical analysis

1. INTRODUCTION

According to Debowski, knowledge management is the process of identifying, capturing, organizing and disseminating the intellectual assets that are critical to the organization’s long-term performance [1]. It is a strategy that could turn an organization’s intellectual property (recorded or expert of its members) into a greater productivity, new values and increased competitiveness. If the knowledge is not managed and catered for, that knowledge will either leave the organization or left unutilized. Thus it is important for organizations to manage their knowledge by implementing strategic knowledge management initiatives. Knowledge can be categorized into two major types, tacit that refers to knowledge resides with the expert and explicit that refers to knowledge which had been documented into manual, reports and such [2]. These are major knowledge that exists in an organization. Tacit knowledge can be defined as knowledge embedded in the human mind through experience and jobs; and explicit knowledge is defined as knowledge that is codified and digitized in books, documents, reports, white papers, spreadsheets, memos, training courses and the like [3]. This knowledge is an asset in today’s modern organizations. Today’s turbulent business environment requires strategic alliances or joint ventures with other similar or complementary business companies [4]. Making it important for the organizations to share their knowledge in order to produce and continue greater value from core business competencies as well as to produce best practice [5].

Zhang and Dawes opined that knowledge sharing activity occurs at the interpersonal, intra-organization or inter-organization level [6]. Many literatures on the inter-organization knowledge sharing involve government agencies indicated that knowledge sharing in the inter-organizations is more complex compared to the interpersonal and intra-organization [6-9]. It is also known that here are many factors that could influence the inter-organizational knowledge sharing activity being trust, risk, motivation, benefits, power, communication, collaboration, readiness and top management support [9-19]. However, the domain of interest that will be discussed in this paper is knowledge sharing among government agencies. Hence the inter-organization in this paper will refer to collaboration among government agencies. Due to the fact that each agency has its own belief, culture and working environment, we believe that these factors (which will be known as elements throughout this paper) need to be uncovered qualitatively. In addition, very little research has looked at knowledge sharing in time-critical environments [17] like flood management. This paper will report on the method applied for coding the transcribed data in order to identify the most influencing elements that contribute to the knowledge sharing between government agencies in the flood management domain. These elements are important as they will be then used to develop an inter-organization knowledge audit management framework that will help them in strategizing their knowledge management initiatives.
The following section (Section 2) will discuss on the theme previously found in the literature in the relation of inter-organizations knowledge sharing. This is followed by the discussion on how data of transcribed interview is analyzed in the research method in Section 3. Subsequently, Section 4 will discuss on the research findings and results. At the end of the paper conclusion is presented.

2. LITERATURE REVIEW

A. Inter-organizations Knowledge Sharing

Knowledge sharing presupposes a relation between at least two parties, one that possesses knowledge and the other that acquires knowledge [20]. In general, knowledge sharing is the act of making knowledge available to others within the organization [21]. However in modern organizations, the activity has no longer confounded in an organization, but also between different organizations. It has become a necessity for different parties to share their knowledge in delivering their tasks and achieving their target goals. This research is based on a definition by Lee who stated knowledge sharing as activities of transferring or disseminating knowledge from one person, group or organization to another which includes both tacit and explicit knowledge [22].

Hendriks, pointed out that knowledge sharing has been identified as a major focus area for knowledge management [20]. Suppiah and Sandhu also argued that to be competitive and productive, knowledge sharing is absolutely necessary and as such organizations with a dominant market culture should have a vibrant knowledge sharing culture [23]. In other research done by Al-Alawi et al., they suggested that trust, communication, information systems/technology, rewards and organization structure are positively related to knowledge sharing in organizations [24]. In understanding the elements that influencing the knowledge sharing, there are three perspectives used to categorize them. Authors like [6-7, 25-27] categorized them into technology, management and political and policy. This paper will adopt these perspectives as the theoretical framework.

B. The technological perspective

The technological perspective concerns on how the use of IT is believed to help in knowledge sharing activities. Researchers believe that knowledge sharing activities can be considered as IT projects involving information systems construction, organizational structure change, and business process reengineering [7]. According to [9], the technological perspectives will help to address the issues of unorganized data management and unstructured information. This is resolved through streamline data management as well as consistent data definitions and standards. Nevertheless, it is not easy to keep up with the pace of technology change. IT has changed rapidly and radically. To maintain adequate levels of knowledge and expertise alongside with technology updates, especially at the local government level is a very challenging task [28-29].

Evidently, researchers like [6] believe that the effectiveness and efficiency of inter-organizational collaboration through knowledge sharing can be enhanced with the advancement of information technology. There are many ways technology in terms of IT could be used to make knowledge sharing more effective. IT Frameworks such as XML, Web Service, and Service Oriented Architecture (SOA) are example of how IT can be applied in connecting the heterogeneous information systems of different platforms [25, 30-32].

However, apart from the technological perspectives many researchers agreed that technological challenge is less complex when compared to the challenges in organizational and political aspects [14, 33-34] as more complicated issues involving organization and policy need to be solved before implementing the technologies.

C. The organizational perspective

Because of the complexity of the relationship between the organizations involved, a typical inter-organizational knowledge sharing relationships rely heavily on trust building between them [9-16]. Trust is built when there is an appropriate exercise of authority, the parties involved are cleared of their roles and responsibility, and there is respect for the autonomy given [35]. Another important factor in the organizational perspective is the leadership. Leadership concerns on providing vision, guidance, and resources, by the top management. This leadership will help to initiate and sustain the knowledge sharing activities [10, 36]. According to Gil-Garcia et al., leadership can be exercised through executive involvement, formal authority, and informal leadership [37].
Knowledge sharing also helps to support problem solving [9]. It helps by providing more comprehensive and accurate information. The act of comparing internal data with external information can improve the accuracy and validity of the data. This help to understand the problem and more comprehensive picture of a problem could be generated. Thus it helps the organization to act effectively in achieving its objectives. On top of that these cooperative activities will also provide an avenue for organizations to expand their professional networking. However, organizational agencies will generally engage in cooperative action only when there is also some reasonable expectation of achieving self interest goals [9].

As mentioned earlier by [11, 16], the complexity of knowledge sharing can increase due to the fact that different organizations possess different operational procedures, control mechanisms, and work flows. Thus, it creates some resistance to change from some individuals [38]. Hence, a strong and sound policy will help to reduce the resistance if it ever exists.

D. The political and policy perspective

It is utmost important for the policymakers to support the inter-organization’s knowledge sharing so that this will become a priority and people are aware of the implication of not having their information shared [9, 39]. Legal and policy is important in the inter-organization knowledge sharing because they help to facilitate the relationship, risk and trust related issues [7, 27, 40-41]. With a policy at hand, related parties will brush off any uncertainty during the knowledge sharing as issues on privacy and confidentiality of the shared information are already take care of. Other researchers [6, 14, 33] also pointed out that policy helps public to trust the government’s knowledge sharing project.

The political and policy will guarantee the organizations to have a comprehensive standard operating procedures or guidelines at hand. The standard operating procedures or guidelines should address and cover the issues on privacy and confidentiality of the shared information. Because people are a vital part of knowledge sharing, clients’ satisfaction and trust is also important in knowledge sharing. This will be accomplished by data integrity and secrecy provided by the sound comprehensive standard operating procedures.

E. Analytical Analysis Method

Interpretive qualitative approach to research is best in addressing issues of description, interpretation, and explanation [42]. Researchers like [42-45] agreed that the strengths of qualitative research in uncovering deeper processes in individuals, teams, and organizations is essential for identifying, analyzing and reporting patterns (themes) within data. However, both [43] and [44] opined that methods of qualitative data collection and analysis are not standardized.

In the field of qualitative research, there are overlaps between content analysis and thematic analysis. In exploring and understanding rich data from interview, two analysis methods could be used. The first is the content analysis that uses a descriptive approach in both coding of the data and its interpretation of quantitative counts of the codes [46-47]. By using content analysis, it is possible to analyse data qualitatively and at the same time quantify the data [48]. On the other hand, thematic analysis provides a more meaningful data. It provides a surely qualitative, detailed, and nuanced account of data, and uncover new theme [45]. Thematic analysis is widely used, but there is no clear agreement about what thematic analysis is and how researchers should go about conducting it [49]. Thematic analysis as an independent qualitative descriptive approach is mainly described as “a method for identifying, analyzing and reporting patterns (themes) within data” [45]. Clearly, thematic analysis involves the search for and identification of common threads that extend across an entire interview or set of interviews [50].

Evidently both approaches support qualitative data analysis. However for this research, the thematic analysis is deemed to be more suitable. Based on the definition and characteristic of thematic analysis, it is most appropriate to use it for analytical analysis in this research. As stressed by [43-44, 50] any approach can be used in the analytical analysis activity for qualitative research. Thus, the Straussian approach is proposed despite the fact that it is mainly used in grounded theory. Details of how the analysis is carried out are explained in the next section.

3. METHODOLOGY

19 semi-structured interviews were conducted with the key personnel who are directly involved in the organizations knowledge sharing. Each of the interviews lasted between forty to ninety minutes. The interviews were all tape-recorded and transcribed. The respondents were asked questions that revolve on how they conduct the knowledge sharing. Data gathered from the interviews were analyzed based on three perspectives of knowledge sharing as mentioned in the previous section. During the interview, handwritten notes were taken along with voice-recording. These notes were also analyzed.
from which initial broad themes were identified. To assure generalizability of data, interviews were carried out in various organizations that deal with flood management which include officers from the team that are involved in rescue (e.g. police, fire department), welfare, communication, health and safety.

The voice files were transcribed by the first author and main comments, while transcribing, were noted. After an initial round of interviews the data was analyzed and the theory is developed. The interviews questions were then amended to explore the new themes that emerged. Due to the need of anonymity of data, names of interviewees were also replaced by Respondent 1 (R1), Respondent 2 (R2) and so on, based on the chronological order of interviews conducted.

Coding of the transcribed interview involved only content that most highly referring to codes such as management, technology and policy. The content of the transcribed interview then was analyzed based on the three perspectives discussed in the literature. The Straussian approach [51] was used in coding the data. This approach has three steps. It started with open coding. The open coding is done to reveal the concepts and properties, as well as the categories of the data. Constructs were derived from an awareness and familiarity from the literatures. This will lead to the emerging of categories. Next step is the axial coding. This process will relate categories to their sub-categories. The last step in coding the data is the selective coding. In this process, core category will be identified. By doing this it will also explain the relationship between categories to provide the overall picture of the factors identified based on the pre-defined theme (priori theory). Figure 1 shows the steps of coding according to the Straussian approach.

**FIGURE 1: Straussian Approach**

Data from the interviews was analysed using the grounded theory analysis by [51]. By using this data analysis approach, it helps to identify the codes, concepts and finally the categories from the transcribed data [52]. These categories were then mapped to the themes mentioned in the earlier section accordingly and it also identified new emerging concept.

4. RESULTS AND DISCUSSION

All of the interview transcripts were read and transcribed by the researcher using the Straussian approach. The rest of this section will describe a few examples of how the analytical analysis of the qualitative data were done. A few dialogues from the interviews were captured and author’s interpretation on the dialogues were presented.

“The job scope has been defined in the act. A working committee has to be set up and everybody in the committee knows their roles and responsibilities. A leader must be appointed to oversee the knowledge sharing process. ..” (R4)

Authors’ interpretation: In order for the organizations to work together, they need to know the goal of knowledge sharing in managing the flood. When the goal is set, it is important for them to work in orderly manner. Working committee must be established to carry out the tasks and person in-charge must be appointed. This is also important for each organization to really understand their roles and responsibilities. This is made possible when a procedure and guidelines are in place. The entire above mentioned concept is supported by the leadership as it helps to initiate and sustain the knowledge sharing activities

“..Depending on how sensitive the data is, all necessary information must be shared. This is to help all parties to achieve their goals and objectives. ..” (R10)

“.Even though there is a documented instruction for knowledge sharing, good rapport among respective officers is also important. Sometimes it is necessary to have a coffee break with them after a meeting. When they know us it is easier to collaborate. ..” (R2)
Authors’ interpretation: Goal decomposition is required to help the people involved in knowledge sharing to further understand their objectives. When they know what their objectives are, automatically they are aware of what information that is needed and what their level of secrecy is. Procedures and guidelines also help them in achieving their goals. Working with people from different organizations requires trust. As mentioned earlier, trust is built when there is an appropriate exercise of authority, the parties involved are cleared of their roles and responsibility and respect of the autonomy given. Procedures and guideline and clear direction from the management will help the trust building. Apart from that trust can also be gained through good relationships between the staff of different organizations.

“...the information must be channeled through appropriate channel and it must be quick enough and available wherever and whenever we need them ..” (R8)

“.. to know the current water level we can get the information from the official portal..” (R9)

“.. the information supplied by the organizations must be presented in a single point of access so that we do not have to look at various sources ..” (R19)

“... currently when there is a flood alert, we will be notified by the authority through our mobile phone. It is so easy because we can get it wherever we are at ..” (R6)

Authors’ interpretation: Knowledge sharing between the organizations must be supported by up-to-date technology but the technology used must be reliable and can be accessed by the users whenever they need them. Having said that, not all information can be shared, security of data must be considered. Working with various organizations sometimes require them to look at others’ website for information. This is time consuming thus a single point of access is required. In critical and emergency situation, push technology is really needed to notify the respective people. Alerts must be published only to the registered users.

Table 1 shows an example of the results produced by coding process

<table>
<thead>
<tr>
<th>Data Extract</th>
<th>Concepts</th>
<th>Themes/ Perspectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The job scope has been defined in the act. A working committee has to be set up and everybody in the committee knows their roles and responsibilities. A leader must be appointed to oversee the knowledge sharing process. ..” (R4)</td>
<td>• Identifying goal&lt;br&gt;• Established committee and person in-charge</td>
<td>Coordination</td>
</tr>
<tr>
<td></td>
<td>• Clear goal of mission and vision of the operation&lt;br&gt;• Procedure/ Act / Direction from Management</td>
<td>Political and Policy</td>
</tr>
<tr>
<td></td>
<td>• Leadership</td>
<td>Organizational</td>
</tr>
<tr>
<td>“..Depending on how sensitive the data is, all necessary information must be shared. This is to help all parties to achieve their goals and objectives. ..” (R10)</td>
<td>• Goal decomposition&lt;br&gt;• Level of secrecy&lt;br&gt;• Procedure/ Act / Direction from Management</td>
<td></td>
</tr>
<tr>
<td>“.. Even though there is a documented instruction for knowledge sharing, good rapport among respective officers is also important. Sometimes it is necessary to have a coffee break with them after a meeting. When they know us it is easier to collaborate ..” (R2)</td>
<td>• Good rapport between agencies&lt;br&gt;• Trust</td>
<td></td>
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</table>
The findings from this paper also show that while the perspectives proposed by [26] are relevant, there is a new theme or perspective that emerged from the data analysis done. Table 1 shows an example of the coding process and the emergence of the new theme. Based on the transcribed interviews of 19 respondents, 14 concepts were identified and were grouped under four different themes. Apart from the three themes mentioned earlier, the study identifies one new theme which is coordination. As described by [53], coordination is about how activities can be coordinated and how actors can work together harmoniously. Managing the shared resources (including task assignments), managing producer/consumer relationship (in this study, it refers to those who produce knowledge and use the knowledge), managing simultaneity constraints (such as meeting scheduling) and managing tasks and sub tasks relationship are categorized as coordination process [54]. Thus based on the data, the authors had interpreted them into concepts like “established committee and person in-charge” and “goal decomposition” that fit the coordination process of managing shared resources and managing task/subtask relationship respectively.

5. CONCLUSION

Three themes from the previous literature which were identified from the analysis are organizational, technological, political and policy. The data analysis had also identified a new theme from the data analysis which is coordination. Coordination manages the dependencies between the activities. This new theme is derived through the use of the grounded theory analysis by [51]. We believe that this is an appropriate approach used in identifying factors for inter-organization knowledge sharing. This is due to the fact that we are dealing with qualitative data and it requires interpretation from the researchers. Furthermore this analysis views data holistically and develops clear relationships among concepts and themes. By using this method of data analysis, it will produce systematic, clear audit trail, robust, rigorous and valid findings.

This paper attempts to report on the method used in identifying the elements for inter-organizational knowledge sharing. It explains how the Straussian approach was used as analytical tool. As suggested by [42], the qualitative data analysis process is allows large amounts of data to be evaluated, simplified and reconstituted into major themes and categories. What happened was the analytical analysis performed on the data in this study had resulted into a greater understanding of the initial data. The analysis done was able to turn large amounts of data into a few ‘factors’ that explain the phenomenon better than the original data could.

Three perspectives gathered from the literature reviews being technology, management and political and policy were used as theoretical framework. Within the context of the inter-organization of public agencies involved in flood management, we identified four emerging themes being technology, organizational, political and policy and coordination. All of these elements are important to be aware of and managed. This finding helps the researcher to understand the elements for inter-organization knowledge sharing in the context of the flood management. We believe that these concepts
and themes identified could be related to our next investigation on inter-organization knowledge sharing, and could help us in developing our research framework. As mentioned earlier, this paper only reports on the method used for analytical analysis of interview data. The outcome from this exercise will be reported in our next research paper.

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