International Journal of Engineering & Technology, 7 (4.15) (2018) 35-38

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper



Establishment of User Requirements Handbook based on the Situational Awareness Knowledge for Malaysian Military Observers

Wan Su Emi Yusnita Wan Yusof, Omar Zakaria, Zuraini Zainol*

Department of Computer Science, Faculty of Science and Defence Technology, Universiti Pertahanan Nasional Malaysia, Malaysia
**Corresponding author E-mail: zuraini@upnm.edu.my*

Abstract

Up to this moment, there are not many studies have been carried out to collect tacit knowledge in the area of peace keeping which are related to the situational awareness. The problems arise when the military observers have come to the end of their service in which they will bring along the knowledge. Furthermore, these issues become crucial when the knowledge is not fully transferred to the new person in charge. Therefore, there is a need to extract the tacit knowledge in a formal approach and come out with a user requirement handbook. Our main framework will be using the combination of two models: Nonaka and Endsley. This framework can assist our research in terms of collecting and transforming appropriate tacit knowledge and documented as a user requirement handbook. By that, this paper is aiming to show some of the results obtained from this study. This finding will then be generated as a user requirement handbook.

Keywords: *Endsley's Model; Nonaka's Model; Tacit Knowledge; User Requirement Handbook.*

1. Introduction

The experience of an individual is known as tacit knowledge. The experience is particularly valuable, especially as a soldier joins the United Nations (UN). This knowledge has personal and tacit elements where it cannot be made fully explicit [1]. It is implicit and needs a mechanism to extract it into an explicit knowledge. Furthermore, it is difficult to convey tacit knowledge to others, as it is an analogue process that requires a kind of simultaneous processing [2]. This is because tacit knowledge is stored inside the individual's mind where it is hidden [3].

Situational awareness involves being aware of what is happening in the environment and determining how information, events, and actions, and others will impact the situation in the present and the near future [4].

Although numerous definitions of situational awareness have been proposed, Endsley defined situation awareness (SA) is the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future [5]. Therefore, it is important that tacit knowledge is related to situational awareness amongst the military observer (MILOB) is collected and documented.

Up to this moment, Malaysian Armed Forces (MAF) has sent contingents, military observers and liaison officers to over 20 countries with the most recent being the mission to Lebanon [6]. This study involves respondents from military observers. The reason why MILOB is chosen as respondents is due to their duties on providing critical decision before they can make the final actions. In order to collect tacit knowledge, we have collaborated with the Malaysian Peacekeeping Centre (MPC) which is located in Port Dickson, Negeri Sembilan.

This study applies a combination of 2 models namely the Nonaka's and the Endley's model [7]. By that, the combined result of both models has become a framework to researcher to collect the experiences of Military Observers (MILOB) in the face of a situation and the actions they had taken to deal with such situations. This framework is a structured way on how to collect appropriate tacit knowledge from the experienced staffs.

All the findings of the data obtained have been analysed and exhibited in the form of user requirements. Then, this user requirement will be generated in the form of a handbook. As a result, from the literature, the military tend to issue more technical reports. Among the literature obtained is from Center for Naval Analyses, they are "Defining and Measuring Shared Situational Awareness" report [8] and "Gaming and Shared Situational Awareness" report [9].

Therefore, this study is the first attempt to gather the experiences with situational awareness among Malaysian military observers. The next section will be discussing the method of this study.

2. Methodology

In this study, a qualitative method enables us to study social phenomenon such as the MILOB's experiences. This paper is a continuation from [10, 7], where it emphasises on findings of data based on situational awareness knowledge. From this qualitative research, 20 respondents have been selected to participate in the face-to-face interview. The purpose of this interview is to reveal the tacit knowledge stored inside the previous MILOB's mind.

For the data collections through strategising in-depth interviews, the first step is to get a list of names of military officers who have served in the UN missions from the *Majlis Angkatan Bersama* (MAB). Based on the list, researchers will contact them personally for the verification of MILOB? If they do, researchers will set the date for the interview. If not, the researchers will get a new list of the names from the MAB. After the date of interview is set, the researcher will proceed with the interview session. If there are MILOB who decided to withdraw from the interview, the researchers will request a list of new names and the process will start again from the beginning until the end of the interview session.

Copyright © 2018 Authors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Meanwhile, the interview questions for situational awareness is related to 3 levels of Endsley's model. Basically, the questions are divided into 2 main components such as: (i) personal introduction and (ii) specific introduction.

The personal introduction includes all of the general information about the respondents. On the other hand, the specific questions, they are totally focusing on situational awareness based on knowledge based framework with the enhanced situational awareness.

The semi-structured interviews method was adopted for data collection among MILOB. During interviews, all of the conversation was recorded using a voice recorder and takes a field notes for the purpose of transcription process and future reference. The entire respondents feel free to share their experiences based on situational awareness that they have faced. In order to ease us in the interview, we have developed a framework which is shown in Figure 1.

In [10] proposed a framework of knowledge based for situational awareness (see Figure 1).

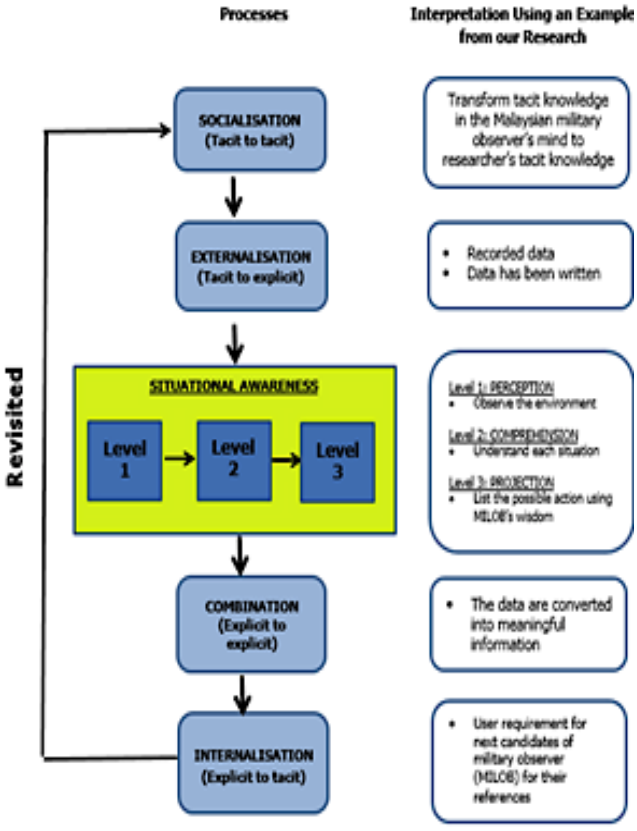


Fig. 1: A framework of knowledge based for situational awareness using Nonaka's and Endsley's models adopted from [10].

Figure 1 illustrates the framework which contains a combination of 2 models namely the model of Nonaka, Toyama and Konno [2], and Endsley [5] model. Referring to the figures, Endsley model was combined within the externalisation and combination mode. Basically there are three (3) levels of Endsley model which are perception (level 1), (level 2) comprehension and (level 3) projection. Based on the understanding of this study, level 1 is dealing with "observe the environment". While, for level 2 is focusing on the "understand each situation" and in level 3 is "list the possible action using MILOB'".

During the process of conversion mode within externalisation and combination, we have collected the tacit knowledge with the respect to situational awareness of a situation faced by the MILOB before entering the combination mode. After that, we inquired the following questions which are related to the situation at MILOB's hand. The questions are listed as follows:

i. How was MILOB observed the environment?
ii. How was MILOB understand each situation?
iii. What is the list of actions that had been taken by MILOB in order to deal with any situations?

Researchers also have carried out these processes before starting the interviews and after the interviews process.

- Place - Go to a place agreed upon by the respondent for a comfortable situation during the interview.
- Introduction - introduce ourselves and projects as well as research's sponsors.
- Consent form - Giving consent form to the respondent to read the terms related. From the consent form, the researchers said regarding to the confidentiality of information, respondent's views and opinions which are very important for this study. Besides that, respondents will be informed that the interview will be recorded.
- Recording - Make recordings during the running interview session.
- Transcript - Reproduce the conversation with the respondents to the transcript provided.
- Analysis - The process of analysing the data to be inserted into the themes that have been defined before which are perception, comprehension, projection. In addition, researchers are using ATLAS.ti software as an aid for the analysis of qualitative data.
- Outcome - The result of the analysis of the data is in the form of user requirement.

The procedure for the interview process conducted by researchers matched with what is proposed by [11]. The expected outcomes from the interview session with MILOB will be displayed in the form of a Table 1 as follows. This table will be serve as a user requirement for the next candidates of MILOB.

Table 1: Expected outcomes from interview session.

Situation	What are the situations that they are facing?
Perception	How respondent observe the environment?
Comprehension	How respondent understand each situation?
Projection	What are the lists of possible action that they have taken?

The next section is the result of the interviews with the respondents regarding their experiences with respect to the situation that they have faced and how they dealt with it.

3. Results and Discussion

As the result of data collection, the experiences that have been successfully collected from 20 respondents included 6 countries namely Sudan, Congo, Western Sahara, Liberia, Sierra Leone and Timor Leste. The number of respondents by country is as follows: Sudan of 3, Congo of 7 people, Western Sahara of 5 people, 3 people of Liberia, Sierra Leone and the people of Timor Leste 1 of 1.

The findings from the in-depth interview sessions have been succeeded in collecting 145 situations from 20 respondents. Of the total respondents, there are 2 respondents who have undergone the detention experience. Nevertheless, as a result of physical, mental and emotional strength, they have succeeded in securing themselves based on the actions taken. Indirectly, this shows that the Malaysian army has a high fighting spirit that they will not give up before it comes to an end.

The following Table 2 presents an excerpt of the fourteenth respondent's experiences who served on UNAMSIL mission in Sierra Leone. The reason why the fourteenth respondent is chosen to be shown as a part of the data finding, it is because the respondent has gone through an experience beyond his expectations limit.

4. Conclusion

The study in the context of peacekeeping is quite new in Malaysia. This paper explains on how this study has been conducted using a knowledge

based framework with enhanced situational awareness for getting the situational awareness's tacit knowledge among MILOB using a qualitative study approach. This in-depth interview has involved 20 respondents of various ranks such as the major, lieutenant colonel and the lieutenant commander. Respondents are distinguished from different military backgrounds, namely the Royal Malaysian Army, the Royal Malaysian Navy and the Royal Malaysian Air Force. The combination of two different models: Nonaka [2] and Endsley [5] have produced a new framework that has been used as a guideline for researchers.

This finding will be made as a user requirement handbook for the next candidate of military observers as additional reference. Based on formal feedback from MPC, this finding is the first and is good for MPC academically.

Table 2: An excerpt of the fourteenth respondent's experiences who served on UNAMSIL mission in Sierra Leone.

Situation	Perception (Observe the Environment)	Comprehension (Understand Each Situation)	Projection (List Possible Action)
Road blocks	• Even though there was permission from the base; the leader did not care if the UN wanted to go through their areas.	• Usually the leader loves to sleep and get drunk. • This is because they like to drink a type of intoxicated drink called *poyo*.	• Do the process of negotiation together with the RUF's commander. • Has to put the food on standby if being asked by the RUF's commander • This is to take the heart of the commander to give cooperation.
Movement of former combatants' members.	• Could not confirm the numbers of exact passengers.	• Each combatant member brought their families, belongings and farm animals. • This hardened the logistics operation because the number of passengers exceeded the number those who were disarmed. • This is because they took advantage of the hostility that has been provided by the UN.	• Report to the base to get the clearance. • This is because it is out of job scope and need to have the administration to make decisions.
Interruptions during the launch of DDR process.	• Leader of the RUF rebels commanded to close the DDR centre. • He threatened to destroy the center of the DDR.	• The RUF was not ready for the DDR process.	• Report it to the base, but the base asks to continue the DDR process. • Has to inform nicely to the RUF leader that the UN gets the order to do the DDR process.
Misunderstandings of the RUF subordinates.	• One of the UN senior members got a call and one of Colonel Gbao's men had overheard it. • The subordinates told Colonel Gbao about the conversation and he solely believed everything that has been told by RUF subordinates.	• The senior member has said "Roger and Out" but has been misunderstood by the subordinates as "flush them out"	• Stop everything • Move away • Stop the discussion before anything unexpected happens.
Being a hostage for 21 days	• Not prepared mentally when caught. • Fear of being murdered • Did not know what will happen due to interchangeable situation. • The person in charge of the hostages did not what will happen next. • Left clueless because current information was not told to the hostages • Did not know why being kept hostage because was not told by the rebels. • Was not told the current progress if there was a discussion to release the hostages. • Concerned of health issues because of erratic eating, malaria infection and uncomfortable settlement for hostages.	Proposed guidelines: • Accept the reality that when you are wearing the uniform the risk is very high and MILOB was unarmed. • Mentally prepared, do not fight back, be cool and calm. • Obey instruction strictly • Be impartial even though being kept hostage. Do not be on their side in order to escape. • Be a good listener; do not ever interfere in whatever they say. • Do not promises anything to the chief hostage just inform that they will notify the UN with the demand of the rebels • Do not take advantages in order to escape and do the things you are not capable to do. • Eat accordingly • Keep healthy by exercising and do not be so sorrows because psychologically it will bring harm to your body. • Pray to God. • Escape if possible if situation allows you. In situational awareness must make a decision.	• Plan to escape if the hostage is 100% sure that there is a death threat from the kidnapper. • Obey instruction strictly, and do not fight back. • If you're not in a good health condition, let the kidnapper know for you to get treatment. • Try to identify the kidnapper's faces. • Do not ask direct questions but try to observe and eavesdrop on their conversations. • Try to identify who is their leader because our information might be useful in the future.

Acknowledgement

The authors would like to thank the Ministry of Higher Education for providing us grant: NRGS/2013/UPNM/PK/P3 in order to perform this research in Universiti Pertahanan Nasional Malaysia (UPNM).

References

[1] Grant, K. A. (2007). Tacit knowledge revisited–We can still learn from Polanyi. Electronic Journal of Knowledge Management, 5(2), 173-180.
[2] Nonaka, I., Toyama, R., & Konno, N. (2000). SECI, Ba and leadership: a unified model of dynamic knowledge creation. Long Range Planning, 33(1), 5-34.
[3] Zakaria, O. (2013). Information security culture: A human firewall approach. Lambert Academic Publishing.
[4] Jones, R. E., Connors, E. S., Mossey, M. E., Hyatt, J. R., Hansen, N. J., & Endsley, M. R. (2011). Using fuzzy cognitive mapping techniques to model situation awareness for army infantry platoon leaders. Computational and Mathematical Organization Theory, 17(3), 272-295.
[5] Endsley, M. R. (1995). Toward a theory of situation awareness in dynamic systems. Human Factors, 37(1), 32-64.
[6] MPC. (2015). Malaysian Peacekeeping Centre. MPC Bulletin, pp. 8.
[7] Yusof, W. S. E. Y. W., Zakaria, O., & Zainol, Z. (2016). Establishing of knowledge based framework for situational awareness using Nonaka's and Endsley's models. Proceedings of the IEEE International Conference on Information and Communication Technology, pp. 47-50.
[8] Nofi, A. A. (2000). Defining and measuring shared situational awareness (No. CRM-D0002895. A1). Center for Naval Analyses Alexandria Va.
[9] Perla, P. P., Markowitz, M., Nofi, A. A., Weuve, C., & Loughran, J. (2000). Gaming and shared situation awareness (No. CRM-D0002722. A2). Center for Naval Analyses Alexandria Va.
[10] Wan Yusof, W. S. E. Y., Zakaria, O., & Zainol, Z. (2016). Exploring tacit knowledge on Malaysian peacekeeping operations through strategising in-depth interviews. Proceedings of the International Conference on Innovation in Business and Strategy.
[11] Lebar, O. (2006). Penyelidikan kualitatif: Pengenalan kepada teori dan metod. Universiti Pendidikan Sultan Idris Press.