

SOCIAL MEDIA AND KNOWLEDGE INTEGRATION BASED EMERGENCY  
RESPONSE PERFORMANCE MODEL

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## DEDICATION

Specially Dedicated to...

My Lovely Parents

My Lovely Husband Maher Hassan

My Lovely kids (Mustafa, Mohammed, Emad and Reem)

My Lovely Sisters and Brothers

My Lovely Friends

My love to you will always remain and thank you for your Prayers, Support, Guidance, Patience, Kindness and Joyfulness to make this experience complete.

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## ABSTRACT

Emergency Response (ER) during the flood is increasingly being characterized as a complex phase in disaster management as it involves multi-organizational settings. This scenario causes miscommunication, lack of coordination and difficulty in making life-saving decisions, which decreases organisational performance. Accordingly, Knowledge Integration (KI) can reduce and resolve problems of coordination and communications which lead to decisions being made at a proper time, thereby increasing the task of Non- Government Organisations (NGOs)' capabilities to achieve better performance. Moreover, use of Social Media (SM) provides many advantages that may assist in eliminating KI's challenges and enhancing its dissemination at low cost, particularly for NGOs that work in disparate places. Despite this, current research into the improvement of task performance using KI through SM in the emergency response context is, unfortunately, limited. Most of the studies are not empirical and there is a lack of theoretical foundation for improving task performance using KI, in addition to using SM to facilitate KI in the flood disaster ER. Hence, it is important to address these issues. The main objective of this study is to identify the factors that influence the Emergency Response Task Performance (ERTP). In this research, the factors which affect the performance of ER tasks were elicited through a review of the literature to identify the essential factors influential NGOs' emergency response. Then, this study developed an ERTP model by combining Knowledge-Based Theory (KBT) of the firm and the Task-Technology Fit (TTF) theory, used to utilise technology. This study applied a quantitative approach to examine these factors. Based on purposive sampling, questionnaires were distributed to over 700 staff and volunteers working for 12 NGOs in Sudan. Smart PLS 2.0 M3 and IBM SPSS Statistics version 24 were used to analyse the data. The results revealed that KI is a significant factor related to ERTP. In addition, it was found that the SM usage factor was significantly related to KI. Furthermore, this study discovered significant differences among the various experiences of volunteers and staff when it comes to utilising SM for knowledge integration in the context of ER response. The results of the study contribute to the body of knowledge by providing a model for ER managers, team members in NGOs and decision-makers to use it as a guideline for successfully assessing and validating ERTP. Additionally, it sets guidelines that may be useful for NGOs in the effective use of social media as a platform for integrating knowledge. Finally, this study provides recommendations to flood decision-makers who are considering enhancing the performance of the tasks within their organisations.

## ABSTRAK

Gerak balas kecemasan semasa (ER) banjir dikategorikan sebagai fasa kompleks dalam pengurusan bencana kerana melibatkan pelbagai organisasi. Senario ini menyebabkan komunikasi kurang berkesan, kekurangan penyelarasan dan kesukaran dalam membuat keputusan bagi menyelamatkan nyawa yang mengurangkan prestasi sesebuah organisasi. Integrasi pengetahuan (KI) dapat mengurangkan kos penyelarasan dan komunikasi yang membawa kepada keputusan yang dibuat pada masa yang sesuai, dengan itu dapat meningkatkan tugas serta keupayaan organisasi bukan kerajaan (NGO) untuk mencapai prestasi yang lebih baik. Selain itu, penggunaan media sosial (SM) memberi banyak kelebihan yang boleh membantu menghapuskan cabaran integrasi pengetahuan (KI) dan meningkatkan penyebarannya pada kos rendah, terutamanya untuk organisasi bukan kerajaan (NGO) yang bekerja di tempat yang berbeza. Walau bagaimanapun, kajian semasa tentang peningkatan prestasi tugas menggunakan, KI melalui SM terhadap prestasi tugas dalam konteks gerak balas kecemasan bencana banjir adalah terhad. Kebanyakan kajian adalah tidak empirikal dan terdapat kekurangan asas teori dalam meningkatkan prestasi tugas menggunakan KI, selain menggunakan SM untuk memudahkan KI dalam ER bencana banjir. Oleh itu, adalah penting untuk menangani isu-isu tersebut. Objektif utama kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi Prestasi Kumpulan Gerak Balas Kecemasan (ERTP). Berdasarkan kajian literatur, faktor-faktor yang mempengaruhi prestasi, tugas ER telah dikenal pasti sebagai yang paling berpengaruh terhadap gerak balas kecemasan NGO. Seterusnya, kajian ini telah membangunkan satu model kajian yang menggabungkan Teori Berdasarkan Pengetahuan seperti Teori Integrasi Pengetahuan (KBT) dan teori yang menggunakan teknologi, seperti Teori Penjajaran Tugas-Teknologi (TTF). Bagi mengkaji faktor-faktor tersebut kajian ini menggunakan kaedah pendekatan kuantitatif. Dengan menggunakan pensampelan bertujuan, borang kaji selidik telah diedarkan kepada 700 orang kakitangan dan sukarelawan di 12 organisasi bukan kerajaan (NGO) di Sudan. Smart PLS 2.0 M3 dan Statistik SPSS IBM versi 24 digunakan untuk menganalisis data. Dapatan kajian menunjukkan bahawa KI merupakan faktor yang penting terhadap ERTP. Di samping itu, dapatan kajian juga membuktikan bahawa penggunaan SM secara signifikan berkait dengan KI. Selain itu, kajian ini juga mendapati adanya perbezaan yang signifikan berdasarkan pengalaman sukarelawan dan juga kakitangan apabila menggunakan SM untuk integrasi pengetahuan dalam konteks gerak balas ER. Dapatan kajian ini juga menyumbang kepada ilmu pengetahuan dengan membina model bagi pengurus ER, ahli kumpulan NGO, dan pembuat keputusan untuk menggunakannya sebagai panduan dalam menilai dan mengesahkan ERTP. Selain itu, kajian ini menetapkan garis panduan yang berguna bagi NGO dalam menggunakan media sosial yang berkesan sebagai platform untuk integrasi pengetahuan. Akhir sekali, kajian ini menyediakan cadangan kepada pembuat keputusan kajian banjir yang dalam pertimbangan untuk meningkatkan prestasi kumpulan organisasi mereka.

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## LIST OF ABBREVIATIONS

AVE	-	Average Variance Extracted
CA	-	Cronbach's Alpha
CR	-	Composite Reliability
EM	-	Emergency Management
ER	-	Emergency Response
ERTP	-	Emergency Response Task Performance
FD	-	Flood Disaster
FDM	-	Flood Disaster Management
ICT	-	Information and Communication Technology
IS	-	Information System
IT	-	Information Technology
KBT	-	Knowledge-Based Theory of the Firm
KI	-	Knowledge Integration
KIMs	-	Knowledge Integration Mechanisms
KM	-	Knowledge Management
NGOs	-	Non-Government Organizations
PLS	-	Partial Least Square
PLS-SEM	-	Partial Least Square and Structural Equation Modelling
SEM	-	Structural Equation Modelling
SM	-	Social Media
TTF	-	Task-Technology Fit

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# CHAPTER 1

## INTRODUCTION

### 1.1 Overview

Throughout history, considerable losses have been caused by natural disasters such as flood, which have damaged both the economy and human lives. Because of their devastating nature, floods are known to cause severe destruction and lead to death either directly or indirectly because of diseases associated with floods. According to Oluwasegun (2016); Zhao *et al.* (2017), as result of floods, multiple lives have been lost and millions of people have been displaced, and thousands of properties have been destroyed and degraded; therefore, floods are considered to be widespread natural disaster. Note that one-third of deaths, damages, and injuries are caused by flood-related disasters, which are gradually becoming more and more serious (Adedeji *et al.*, 2012; Zhao *et al.*, 2017). Both developed and developing countries have to face the impact of such disasters as there is a constant focus to quickly expand urban areas, many of which are often located in many flood-prone areas (Nkwunonwo *et al.*, 2016). Damages caused by floods because of natural hazards worldwide can be estimated at 30% in terms of economic losses, which is particularly important if we consider that most countries are still developing (Latif and Arshad, 2014). Craddock and Teale (2016) discussed how floods can be referred to as something covering dry land because of overflowing waters that cannot enter the usual confines of watercourses or lakes. Also besides, when running water rises more than the channel's capacity and overflows its boundaries, it is referred to as a flood (Djimesah *et al.*, 2018).

For example, in Sudan (the focus of this study), the Blue Nile frequently floods due to the geographic location of the Ethiopian plateau, which witnesses



unpredictable surges in water. Subsequently, recurrent floods have led to substantial losses of human lives and damaged infrastructure such as schools, hospitals, and governmental offices. Recently, there were floods in 2017 and 2016. According to Reliefweb (2017), on 20 June 2017, heavy rains and the subsequent flash floods destroyed 2,121 houses in North and South Darfur. Within Shangil Tobayeh, 162 houses were destroyed and 89 partially houses were damaged; moreover, 144 toilets were completely destroyed. On 10 July 2016, continuous heavy rain across Sudan led to a flood. It affected more than 122,000 people, led to 29 deaths, and 21,500 houses were destroyed in different parts of the country. Note that the flood hit 15 of the 18 states of Sudan; however, states that most affected were West Kordofan, South Kordofan, North Darfur, Blue Nile and South Darfur. Furthermore, the total extent of damage amounted to nearly \$242.7 million (OCHA, 2016).

Although it is impossible to stop disasters like floods, having a sound and effective flood disaster management (FDM) plan is important and can be managed well. This plan can be referred to as the collaborative decision-making activities, in which a high level of complexity is characterised. Emergency response as one phase of FDM that begins when a flood occurs, which, involves multi NGOs working together they have different teams and it involves several knowledge sources that are disseminated with time, space and people. Furthermore, as put forward by Saeed (2012), the main concern in flood disaster response management lies in the coordination and communication of activities of diverse organisations, at both inter- and intra-organisational levels. During an emergency response, specialised operational experts need to coordinate their operations and actions across organisational boundaries (Wolbers and Boersma, 2013). According to Dorasamy *et al.* (2013), to achieve enhanced and successful management response requires proper planning, a well-coordinated tasks and a guided effort is necessary. Moreover, response knowledge is not always readily available and decision-making is not dependent on one person; moreover, all of the knowledge will not be coming from the same place (Othman *et al.*, 2014b). The members should facilitate faster decision-making among the broad variety of non- government organizations, including those in the public sector, the private sector, and volunteers, thereby enabling immediate help to those affected by flood disaster (Janssen *et al.*, 2010).

Therefore, it considers Knowledge Integration (KI) is the process of communication among individuals, sharing and integrate expertise and specialist individuals' knowledge during the flood, as well as, coordinate their tasks for accurate decision-making that solving emergency response problems. Such improve the emergency response task performance. In order to have better KI, non-government organizations need to realize and define their different roles and responsibilities. Recognizing each function with sufficient communication helps to combine knowledge and to ease numerous processes in the wide distribution of knowledge, this in turn lead for improving flood management (Zakaria *et al.*, 2018). Besides, social media could improve the performance of NGOs by enabling interaction between NGOs' members to ensure obtaining and disseminating information related to their tasks. By integrating the core knowledge, which is in line with an organisational mandate, the enhanced information technology can transform knowledge into action, which then encourages employees to share and integrate their knowledge (Basaglia *et al.*, 2010). Academic research has provided some exploratory insights into social media's influence on knowledge management (Fung and Hung, 2013). According to Garcia-Morales *et al.* (2018) the extensive communication and speed in the exchange of knowledge provided via social media, are key to integrating knowledge. Despite the growing interest in KI, the potential impact of social media for integrating knowledge to successful disaster response. There, is a little empirical evidence on adoption and usage in KI, which forms a gap in the literature (Cao *et al.*, 2015; Hong and Liang, 2015; Tajuddin *et al.*, 2019). Even though previous literature suggest the knowledge integration enhance the organizational performance there is still little empirical evidence on their adoption and usage in the context of emergency response (Zakaria *et al.*, 2018) in Sudan. This issue is now the core concern of the current study, which aims to investigate the factors that influencing the emergency response task performance through knowledge integration using Social Media.

## 1.2 Problem Background

Globally, floods, which is dangerous and disruptive, is a natural disaster that occurs in both highly developed and densely populated regions (Qiu *et al.*, 2017). Floods have now become a significant threat to sustainable development and human existence, e.g. a 2015 report by the World Resource Institute (WRI) predicted that people who would be affected by flood globally would be more than 54 million by 2030 compared to 21 million in 2015 (Ganiyu *et al.*, 2017). Lai *et al.* (2015) reported that flooding led to losses of more than US \$600 billion and nearly 7 million deaths worldwide. For example, if we consider Western Europe, every year there has been a significant occurrence of floods, e.g. Belgium, France, and Germany were hit by floods in 2010, during which more than 30 people died. The damages because of the flood were estimated to be more than US \$1.8 billion (Leskens *et al.*, 2014). In certain developing countries, floods are considered to be one of the most costly natural hazards because of the human and economic losses. In Sudan, a developing country and an Arab republic in the Nile Valley of North Africa that has a population of 38,435,252, each year, floods occur and hit large sections of the country and regions. This is because of the geographic location of the country, which has a low-lying terrain and gets affected by rainwater flow from neighbouring countries.

Note that the Blue Nile is a seasonal river, which is subject to flooding events that can cause devastating damage along its path. During exceptionally wet periods, in the floodplain areas of Ethiopia and Sudan, the Blue Nile can give rise to large-scale flooding. Sudan has previously experienced devastating floods too. In particular, the flood in 1988 was the first of a series of high floods that have struck Sudan, recently, in 2017, 2016, 2013, 2012, and 2007 (Mekawi, 2010). At the end of June 2017, heavy rains leading to flash floods affected 10,600 people (1,780 families) at the Kalma IDP camp, South Darfur, and destroyed infrastructure such as schools and houses. During this flood, which continued for approximately three months, around 42,700 children suffered from acute malnutrition in Jebel Marra; moreover, it cost UNICEF around US \$22 million to fulfil the needs of the affected area and provide a lifesaving response for more than 100,000 children (OCHA, 2017).

Similarly, in mid-June 2016, the rainy season led to several challenges caused by flash floods in which nearly 122,000 people across the thirteen states of Sudan were affected. The most affected areas were Kassala, North Darfur, and El Gezira where houses and latrines were destroyed. Moreover, schools, health facilities, roads, bridges, as well as other infrastructure were destroyed. Furthermore, at least 70 people were reported to have died, according to the Sudan National Council of Civil Defence, and 40 were injured across Sudan after the start of heavy rains. Moreover, more than 19,338 houses were reported to have been destroyed completely, with over 10,220 houses partially damaged, more than 616 latrines damaged and 70 public institutions, mostly schools, affected (Davies, 2016). In August 2013, an intensive downpour was recorded across the Sudanese states such as Khartoum, North Darfur, Blue Nile, South Darfur, River Nile, West Kordofan, with varying degrees of magnitude. The Sudanese Red Crescent Society (SRCS) estimated the damage because of the subsequent flash floods to be of around US \$7,384,813. According to the Federal Ministry of Health, as mentioned in the World Health Organisation report (2013), 38 localities in 13 states were affected with 49,664 families and nearly quarter of a million people were forced to leave homes. Moreover, flooding destroyed the social infrastructure such as hospitals, health facilities, schools, mosques, community facilities and government offices (IFRCS, 2014), and much of the livestock was either washed away or killed. Subsequently, the flooded wells and latrines caused contamination of water sources, which resulted in additional health problems and water-associated diseases such as malaria, diarrhea and fevers. Personal belongings and livelihoods of the inhabitants were lost, and living conditions had become alarming without any safe water and sufficient sanitation facilities; therefore, the situation required urgent assistance in terms of emergency shelters, safe water, food, as well as sanitation facilities. According to SRCS's estimated assessments of damage in the other parts of Sudan, 17 states were affected because of the flood, and at least 28,621 households (177,724 individuals) were displaced. The estimated damage to Sudan included 16,225 completely destroyed houses with 18,616 partially damaged ones (IFRCS, 2014).

Due to the nature of flood hazard, significant damage can be caused by floods if the response fails, multi-NGOs with their teams participation, people working

under time pressure and stressful condition and need to pool different types of expertise, that cause lack of communication and coordination, which lead to shortage on decision- making or delay of life saving time. Which can increase the risk imposed on the community and individuals involved in such cases.

The emergency response phase “implements the emergency response plan and begins coordinating responders and other resources. Additionally, this phase is the command and control phase that requires the emergency response NGOs to monitor conditions and to coordinate response accordingly (Wex *et al.*, 2013). As well as, locate and deliver required supplies and evacuate affected people, the tasks of emergency response are characteristically complex and dynamic in terms of the required accuracy and speed of sharing information with other organizations (Rive *et al.*, 2012). Which involve temporary many non-government organisations who rarely work together and their improvised organizational structure and individuals who are unfamiliar to each other. Unlike traditional organizational teams who have stable structures and work together regularly, emergency teams’ members form rapidly in response to unanticipated disasters; making them dynamic (Power, 2018). This could lead to difficulties in making accurate decisions, under time-pressured and intense situations, while responding to a particular disaster situation (Dorasamy *et al.*, 2013).

In addition, organisational problems and inadequate communication and coordination in large-scale emergencies is one of the most reported concerns, and can become a major issue in the disasters (Power, 2018; Wex *et al.*, 2013). Several previous studies have revealed that flood disaster management fails because of constraints such as lack of resources and poor communication, which impacts the performance of organisations when dealing with disaster operations (Latif and Arshad, 2014; Yates and Paquette, 2011). However, during an emergency response, communication can be difficult for various reasons such as numbers of NGOs located in various places, the equipment not work functionality, most disasters cause severe damage to communication infra-structure Phone switches and cell phone towers might collapse (Simon *et al.*, 2015). Therefore, all sources of information can be helpful to provide real-time updates that can be crucial during extreme events to achieve better overall performance (Francalanci *et al.*, 2017). Communication

becomes crucial when there of many organizations and each one operate their own radio frequencies, making it difficult to create a unified and synchronized response. The primary challenge is technological (Simon *et al.*, 2015). The event is triggered when the flood disaster hits, followed by the response phase. In this phase, the challenge of rapid changes in situations, and the need for speedy coordination of those involved, necessitates a timely operational response with appropriate decision-making (Dorasamy *et al.*, 2017). According to Aros and Gibbons (2018) effective disaster response depends on coordinated efforts by a variety of organizations. Timely exchange of complete and accurate information forms a crucial foundation for all activities, as multiple organizations work together to locate needed resources and arrange for their delivery. Problems in emergency response efforts may be evident whenever signs of inadequate communication, poor coordination, and inadequate cooperation processes between NGOs' member appear (Bearman *et al.*, 2017).

Previous studies confirm that the biggest problem faced by organisations during a disaster in developing countries is communication (Glenn Richey Jr *et al.*, 2009; Jahre *et al.*, 2007; Van Wassenhove, 2006). The efforts of NGOs in Sudan, a developing country, frequently suffer from miscommunication and the lack of coordination among non-government organisations in dispersed places. This becomes especially evident during the first phase of emergencies when roads may be blocked and bridges damaged by flooding, while radio equipment may not be functional (IFRCS, 2013).

Because different failures during emergency response continued to occur, there was an urge to minimise hazards of such tragedies via improvement in emergency response operations. Thus, for civilian safety in such cases and to mitigate losses, flood disaster management needs to be enhanced. Emergency response involves extensive coordination, communication, and integration within a dynamic environment (Dorasamy *et al.*, 2013). The unique nature of emergency situations warrants emergency responders should be able to quickly and efficiently share their information and updates among all responsible parties in an appropriate time and place (Debnath *et al.*, 2016). Emergency response organisations can share information, while making sure that their own disaster response efforts are

effectively coordinated (Kapucu and Hu, 2016). Hence, effective communication is vital to ensure that accurate knowledge and information are captured, dispersed and integrated to emergency managers and decision-makers, who can execute evacuation plans and also share the newest information with volunteers and staff who are assisting people in affected areas (Debnath *et al.*, 2016). Consequently, applying knowledge from previous experiences of decision-making to current decision-making activities with the express purpose of improving the organization's effectiveness.

Although there are differences in approaches taken by various researchers, it is observed that most researchers agree that managing flood related knowledge takes the highest priority in finding a potential solution for flood scenarios as they are dynamic in nature (Zakaria *et al.*, 2018). Choosing the most efficient way to approach emergency response tasks is crucial to ensure improved performance in its situations, where appropriate reaction depends upon the ability of public officials, divisional managers, volunteers and staff to coordinate their shared information. Individual or collective actions may fail in situations where emergency response participants do not fully comprehend the complexities of operating in the areas affected by the flood, due to miss the integrated knowledge (Zakaria *et al.*, 2016). Appropriate and efficient emergency response depends on the quick dissemination of updated information, fully knowledge and coordination between multiple organisations that supports better decision-making, across several locations to solve complex situations. Therefore, the KI can improve the performance of emergency response task (Mehta and Mehta, 2017). Realizing a critical need to manage knowledge and past experiences so as to ensure significant improvement in flood emergency response, this research proposes a process of knowledge integration (KI) for managing floods in Sudan. In this process, the KI is identified as the process of communication among individuals, sharing and integrate expertise and specialist individuals' knowledge during the flood, as well as, coordinate their tasks for accurate decision-making that solving emergency response problems.

Non-government organization' members typically assimilate knowledge by communicating verbally via one of Knowledge integration mechanisms such as rules

and direction, routines, sequencing, and group problem solving and decision-making (Grant, 1996). In the meantime, it is critical to ensure that their expertise is coordinated, and that information about who knows what in each member is shared. These active inter-personal communication and coordination activities allow non-government organisation members to develop a general perspective of the problem, as well as potential solutions to each situation (Mehta and Mehta, 2017). Knowledge integration mechanisms as formal processes provide guidelines or directions to ensure that new routines and developments are well coordinated, and enable open face-to-face communication between NGO members (Tsai *et al.*, 2015). Furthermore, Enberg (2012) stated that integration mechanisms has a positive effect on horizontal communication. The cost of communication and learning of the first three KI mechanisms (rules and direction, sequencing, and routines) can be avoided by seeking efficient integration. On the other hand, the fourth mechanism of knowledge integration is problem solving and decision-making, required interactions and costly communication. Studies have also shown that social interactions such as social media, and coordination mechanisms involved in the KI process, promote a common understanding of NGO objectives and how to achieve them, resulting in better performance (Mehta and Mehta, 2017). Previous research recommended the adoption and using IT to permit the integration of knowledge, which can facilitate communication while lowering the cost compared to face-to-face communication and interaction (Enberg, 2012). Especially in dispersed located places in case of emergency response. In spite of the literature indicates that various technological tools can be used to enable KM processes and advantages associated with the use of them for integration knowledge. IT can support the process of knowledge creation, sharing, dissemination and creation of a useful organizational memory system to enhance emergency planning and response (Dorasamy *et al.*, 2013; Turban, 2008). In the realm of emergency management, knowledge management system enables the collection, retrieval, dissemination, storage and applied of the right knowledge to be used in the right place and at the right time (Dorasamy *et al.*, 2013). One of the organizations challenge in integrating knowledge the specialized knowledge required for the emergency response activities is dispersed among various NGO members with different skill sets (Carlile, 2002). By technology which enable the exchange and combination of specialized knowledge, due to help negotiate and establish a shared vision for the tasks



(Patnayakuni *et al.*, 2007). Social media encourages, supports, and enables people to share their knowledge easily and effectively through different mechanisms (Panahi *et al.*, 2012). Social media have ability to integrate all information and knowledge that can be obtained (Tajuddin *et al.*, 2019). Furthermore, the utilization of the social media has facilitated flood-related knowledge to be exchanged and integrated in a speedier and more effective way (Zakaria *et al.*, 2018). Even though, there is still little empirical studies on their adoption and usage in the knowledge integration (Cao *et al.*, 2015; Tajuddin *et al.*, 2019) especially in the context of emergency response on Sudan.

From the disaster management point of view, knowledge management (KM) is perceived as an important element for the procurement of disaster-related data (Zakaria *et al.*, 2018). An integrated knowledge solution will greatly improve emergency response efforts, especially in the context of disasters in a highly turbulent environment (Dorasamy *et al.*, 2013). According to Zakaria *et al.* (2016), KI is considered to be a factor that has contributed to flooding management. For a response to floods, there is a requirement for multiple improvements such as ensuring the effectiveness and efficiency of non-government organisations (Othman *et al.*, 2014). According to Li *et al.* (2017a), KI has a significant positive effect on performance. Knowledge integration has been significant concern in analysing the organization performance (Tajuddin *et al.*, 2019).

Although the previous literature indicated the role of knowledge integration for organizational performance in others such as socio economic landscape, less attention has been given to exploring explicitly the role of knowledge integration in flood emergency response task performance (Zakaria *et al.*, 2018). Additionally, there is limited empirical study has clearly explained and theorised the emergency response task performance through knowledge integration using social media (lateef Saeed *et al.*, 2016). Therefore, the main aim in this study is to fill the gap in knowledge and practice by gathering empirical evidence on the importance of the emergency response task performance based KI. This study also empirically investigates the factors that contribute to effective utilization of SM among the staff and volunteers within non-government organizations to integrate knowledge. To

apply a theoretical model examining the emergency response task performance is useful because it provides a framework to help identify the determinants of successful intervention. Thus, as far as we are aware, the proposed model is the first effort as researcher knowledge to empirically investigate the use of social media for knowledge integration to improve emergency response task performance within non-government organizations in the Sudan context.

### **1.3 Problem Statement**

Considering the above discussions, and particularly in the Sudan context, it is clear that the lack of technical communication and coordination among diverse NGOs, across diverse levels and locations, has caused many flood responses to fail which lead to reduce task performance. These failures highlight the importance of KI for effective decision-making and coordinating tasks to improving flood emergency response task performance. The problem is that the current research into the assessment of social media for knowledge integration regarding the task performance in a flood emergency response context seems to have limitations. No empirical study has been conducted that clearly explains emergency response task performance through knowledge integration within non-government organizations (Zakaria *et al.*, 2018). While knowledge integration having a better role to coordinate activities during complex situations that lead to improve the performance (Eslami *et al.*, 2018). In another hand, most of the previous researchers were mainly focused on the exploration of the general role of social media technologies for knowledge management and knowledge sharing among the diverse disaster-related non-government organizations (Ahmed *et al.*, 2018; Dorasamy *et al.*, 2013; Kaewkitipong *et al.*, 2016; Yates and Paquette, 2011). Additional to the increasing variety of information technology applications, knowledge integration in cooperative work with social interaction has emerged as an important research topic (Hong and Liang, 2015). Even though, there is a little empirical evidence on adoption and usage in KI, which forms a gap in the literature (Cao *et al.*, 2015; Hong and Liang, 2015; Tajuddin *et al.*, 2019). Moreover, No empirical study has clearly explained and

theorised the emergency response task performance through knowledge integration using social media (Lateef *et al.*, 2016).

Accordingly, the imperative aim of the present study is to investigate the factors that influence emergency response task performance, build, and test a model for explaining the improvement of emergency response task performance through knowledge integration using social media within non-government organizations. It is expected that the findings will help to improve emergency response task performance.

#### **1.4 Research Questions**

In order to address the above-mentioned main problem, the major question addressed in this research is “*How to enhance emergency response task performance through Knowledge Integration using social media platform?*” To find the answer, this main question has been broken down into three sub-sections as follows:

- i- What are the factors that influence the emergency response task performance?
- ii- What is the relationship between social media usage and knowledge integration in the context of flood emergency response?
- iii- How to propose and validate a model for emergency response task performance through knowledge integration via social media?

#### **1.5 Research Objectives**

The main objective of this study is to contribute to a theoretical understanding that allows developing a model of “Emergency response task

performance through Knowledge Integration using social media platform”. A reflection on the problem statement and the search for the study questions led to the identification of the following set of specific objectives to guide the study:

- i- To identify the factors that influence the emergency response task performance.
- ii- To examine the relationship between social media usage and knowledge integration in the context of flood emergency response.
- iii- To propose and validate a model for emergency response task performance through knowledge integration via social media.

## **1.6 Scope of the Research**

This study focuses mainly on Sudanese non-government organizations working in the emergency response context including local and international non-government organizations that have implemented Social Media for tasks. Thus, the NGOs emergency response is the base on the unit of analysis. This research considers only NGOs staff and volunteers members that have experienced and been engaged by using the SM on emergency response activities. Based on the main problems were being tackled in the literature and consistent with Sudan’s reports focused mainly on these two as crucial problems there communication and coordination (IFRCS, 2013). Due to the nature of SM, this study attempts to discover various factors that can potentially influence the using of SM for knowledge integration in flood emergency process. In this study, a positivism approach is used as both a research paradigm and the quantitative method. The data was collected using a questionnaire, which was distributed to volunteers and the staff of 12 NGOs using a purposive sampling technique. This research focuses on developing a reliable and validated measurement model for guiding emergency response task performance through influential factors of it. The Structural Equation Modelling (SEM) using Partial Least Squares (PLS), which is the Smart PLS 2.0 approach, was used to test

the collected data. Several analysis tools including MS Excel 2013, IBM SPSS 24 were used to analyse and validate the research model.

## **1.7 Significance of the Research**

Advancing technology and innovation of emerging software, such as social media, as a tool has helped bring a new wave of possibilities and opportunities for knowledge integration within non-governmental organisations (NGOs), which will in turn, encourage more member to share their experience and knowledge on flood. These changes can help to significantly contribute to integrate knowledge and help manage flood disaster-related tasks during an emergency response. Our study claims that there is a requirement for a more comprehensive assessment of KI's impact on emergency response task performance. This is particularly important because of the complex nature of non-routine knowledge emergency responses during a disaster response.

The development and testing of an emergency response task performance model requires the integration of the two theories of knowledge-based theory of the firm and task-technology fit by integrating several factors derived from the related literature. Thereby, this work can help practitioners to gain a greater understanding of what factors influence emergency response NGOs' decisions regarding improved their task performance through KI using SM. Moreover, our study provides details on how KI can coordinate and communicate between members of different NGOs through KI mechanisms and using social media. Which would assist managers in proper decision-making that will then help improve the emergency response task performance.

Findings of the study significant to the body of ideas and knowledge about SM for KI and KI for improved emergency response task performance, which is accompanied by the development of justified constructs and a verified measurement

model for ERT performance in a flood emergency response context. The outcomes of this study could guide emergency managers, decision-making and team members at NGOs in turning each emergency response into an opportunity for creatively using social media as a platform for integrating knowledge. Furthermore, our study would be useful for NGOs to align their emergency response tasks towards performance.

## **1.8 Organization of the Thesis**

This study was structured such that it could provide a critical review of the information related to this study's topic. As shown in Figure 1.1, this thesis is organised into three primary sections comprising six chapters:

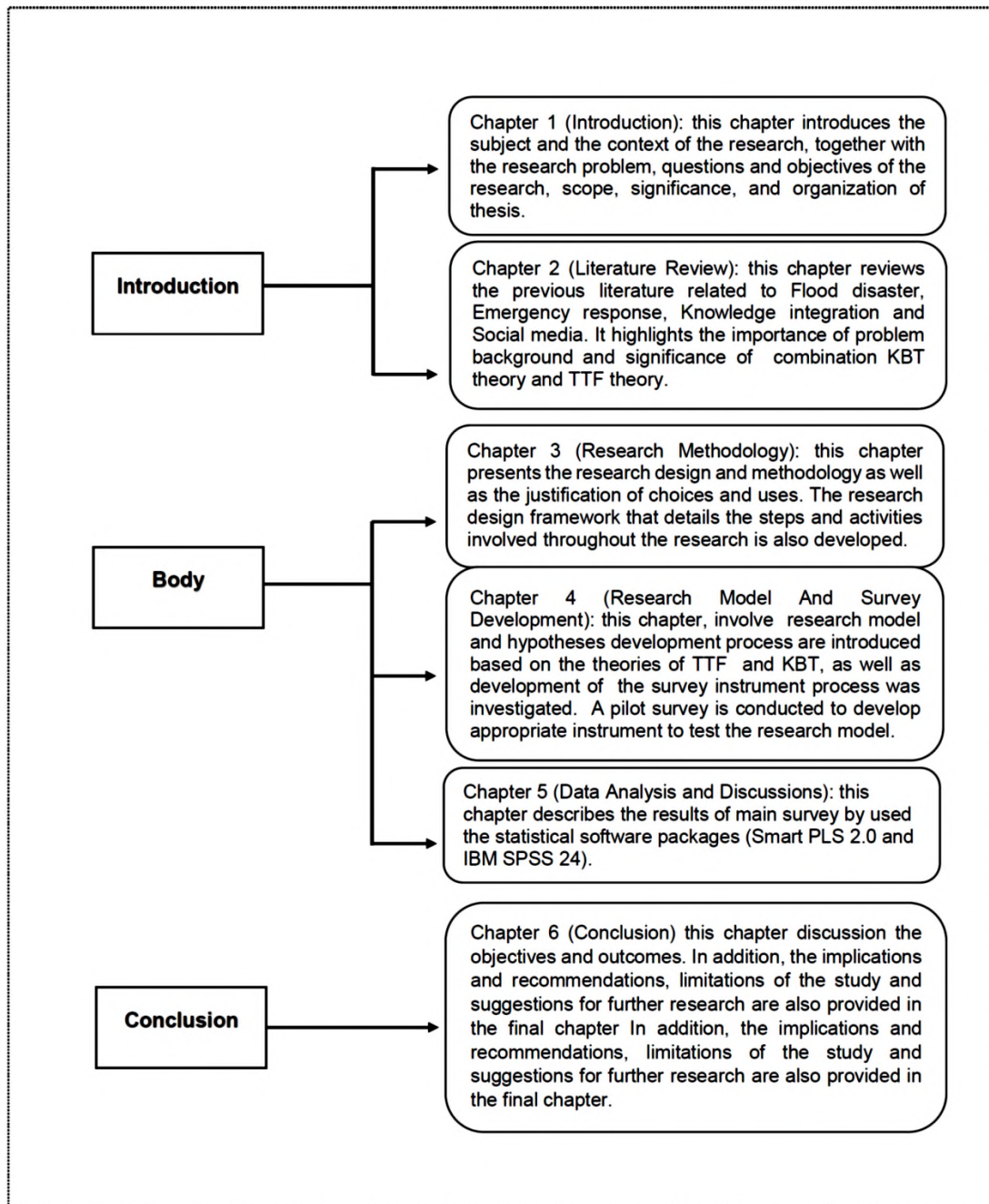


Fig 1.1 Outline of Thesis

## 1.9 Operation Definitions

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**i. Flood Disaster Management (FDM)**

Flood disaster management can be described as a concept, policy, plan and operation that include four cyclical steps: preparedness, readiness, emergency response, recovery and rehabilitation. The principles of FDM highlight accuracy and speed required for compiling information that would enable decision-making (Tingsanchali, 2012).

**ii. Emergency Management (EM) and Emergency Response (ER)**

ER is considered to be one of the stages of FDR, and it requires the ability to take actions to effectively deal with disasters as they occur (Shang *et al.*, 2017). EM is defined as the act of handling unexpected events through a defined routine procedure, which can be handled by agencies for reducing the impact of a large-scale disaster (Haddow *et al.*, 2017). Terms such as emergency management and disaster management are often used for conveying the same thing. Similarly, emergency response or crisis response is interchangeably used to describe the same idea. However, in this thesis, have used ER and EM to convey the following: Emergency Management (EM) is used to refer to the context emergency response in the application domain (Sudan) as it is more prevalent and has been previously used to describe the same concept. On the other hand, Emergency Response (ER) deals with a generic idea of systems and humans that are used to address disaster-related situations.



### **iii. Emergency Response Task Performance**

ER performance is achieving a set of emergency response tasks by NGOs' members with the improved efficiency and effectiveness associated with using KI strategy (Gudi, 2008).

### **iv. Social Media (SM)**

SM is an emerging technology internet-based services that play a very important role during ER. These technology enable field responders to communicate within respective agencies as well as communicate, share and integrate knowledge with other non-government organisations (Ahmed *et al.*, 2018).

### **v. Knowledge Integration**

Knowledge integration (KI) is the process of communication among individuals, sharing and integrate expertise and specialist individuals' knowledge during the flood, as well as, coordinate their tasks for accurate decision-making that solving emergency response problems (Haddad and Bozdogan, 2009).

## **1.10 Chapter Summary**

In this chapter, an overview of the research is presented. It then discussed the background of the problem as well as arrived at the problem statement. This is then followed by research questions and objectives, as well as the scope of research.

Finally, this chapter also presented the importance of the research and provides the structure of the thesis. The literature review is then presented in the next chapter.

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## LIST OF PUBLICATIONS

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2. **Naglaa Abdel lateef Saeed**, Nor Hidayati Zakaria and Mohammad Nazir Ahmad ‘A Model of Measuring Flood Emergency Management Task Performance’ *Journal of Information Systems Research and Innovation*, Published, 2016, (Indexed by Google Scholar).
3. **Naglaa Abdel lateef Saeed**, Nor Hidayati Zakaria and Mohammad Nazir Ahmad ‘Team Performance in Flood Emergency Response: A Conceptual Model and Scale Development’ *International Journal of Integrated Engineering*, Accepted, 2018 (Indexed by Scopus).