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TOWARDS EXPLORING FACTORS THAT INFLUENCE SOCIAL MEDIA-BASED KNOWLEDGE SHARING INTENTIONS IN DISASTER MANAGEMENT

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ABSTRACT

Knowledge sharing is considered vitally important for the success of disaster management initiatives. Within the process of disaster management, a growing number of users have started to utilize social media as a means of knowledge sharing. Specifically, social media empowers individuals to take part in knowledge sharing activities, which will in turn encourage more people to join in disaster relief activities. Encouraging online knowledge sharing behaviors among employees is a prominent research topic. However, to date, little empirical research has been undertaken to examine social media- based knowledge sharing behaviors within the disaster management domain. This study explores the factors that facilitate voluntary social media-based knowledge sharing intentions, for use within disaster management. The study offers a conceptual model for assessing these factors. In this paper, the three dependent variables of individual attitude, subject norms and perceived behavioral control are defined as related to social media-based knowledge sharing intention. In addition, the three groups of organizational factors, individual factors and technology factors, with seven subset variables of management support, organizational reward, knowledge self-efficacy, interpersonal trust, enjoyment in helping others, perceived usefulness and perceived ease of use, are identified as independent variables in this study. This study reviews the existing literature both in the field of social media-based knowledge sharing in general and in the disaster management domain in particular. Comparing this research with other studies, the main difference is that this study proposes a full set of factors that influence social media-based knowledge sharing behavior. Concluding remarks and suggestions for further statistical study work are provided, particularly in relation to the implications for disaster relief organizations in Somalia.

Keywords: *Knowledge Sharing, Social Media, Social Media-Based Knowledge Sharing, Disaster Management.*

1. INTRODUCTION

Over the last several years, the recognition of the importance of social media-based knowledge sharing within disaster management has grown [1, 2]. Emergency managers have learned that sharing knowledge about disaster management is as essential as saving lives during an actual disaster event [3]. In the event of a disaster, timely and efficient knowledge sharing can curtail impacts, by ensuring an effective response and the economic use of disaster management resources [4]. Knowledge sharing creates opportunities to maximize organizations' abilities to meet needs and generate solutions [5]. Knowledge sharing is defined as the information process and social interaction that takes place within the human mind. It also involves an exchange of knowledge, including experiences and skills among individuals, groups, departments and intra-external organizations [6].

Many researchers have argued that effective knowledge sharing requires tools such as social media technology; social media-based knowledge sharing is a process through which members of an organization can acquire disaster knowledge. For instance, when disaster occurs, complex tasks and uncertain conditions are commonly involved, and outcomes can include tremendous social, economic and environmental impacts. A response requires effective knowledge sharing which facilitates faster decision-making among the broad variety of relief organizations, including those in the public sector, the private sector and volunteers, thereby enabling immediate help to those affected by catastrophe [7].

Knowledge sharing is one of the most essential success factors of knowledge management, as it can

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enable organizations to leverage their most valuable asset, that is, the employees who share their knowledge with others. Without effective knowledge sharing among organizations, employees may not be able to bring together their expertise, particularly their skills and abilities, in order to coordinate and accomplish dynamic, uncertain and complex tasks [8]. Several studies have indicated that knowledge sharing through social media is an ideal replacement for rigid traditional knowledge sharing methods. For example, disaster responders, such as NGOs and civil and military organizations, could acquire information simply by logging in to obtain the latest information and knowledge about disasters [70, 2,1]. This allows for rapid knowledge sharing and communication between diverse organizations, as distance barriers are minimized [9]. The use of social media tools to facilitate knowledge sharing processes can open opportunities and clear the way for communication between relief organizations and community members, in order to create, filter and share real-time knowledge during a disaster [2].

Despite a growing number of studies regarding social media-based knowledge sharing in disaster environments, few studies have examined the different antecedent factors that impact social media-based knowledge sharing behavior in disaster management efforts. [10] found that the literature on social media-based knowledge sharing behavior has focused on individual, organizational and technological factors. Such studies have shown that social media-based knowledge sharing is directly influenced by these factors. However, earlier research has identified that not enough studies have been conducted to investigate the factors that influence individuals' willingness to share knowledge with others through social media channels in times of disaster [11]. In order to bridge this gap in the literature, the objective of this study is to deepen our understanding of the different factors that determine the levels of knowledge sharing intention via social media in disaster management.

Researchers [12, 13] have followed the theory of reasoned action (TRA) [14] to examine an individual's behavioral intention. However, many information system (IS) researchers have suggested that the TRA model is unable to predict the performance of behaviors over which people have incomplete volitional control. It means that the individuals might have little power over their behavior [15, 16]. It is supposed that online knowledge sharing is undertaken through personal volition and that knowledge is shared voluntarily. Based on this reason, knowledge contributors may face practical constraints, which could include the level of control over the intended behavior, or the individual's willingness to share his or her knowledge with others, along with technology-facilitating conditions such as resources and opportunities, or an inability to provide knowledge via social media.

These issues call for the incorporation of the theory of planned behavior (TPB) which has been applied successfully to predict and explain behavior where individuals might have incomplete volitional control [17]. TPB extends TRA through the addition of the perceived behavioral control (PBC) variable. In the knowledge sharing context, PBC outlines that a person's willingness is influenced by the perceived difficulty involved in the knowledge sharing task, and how successfully an individual perceives they can fulfill the task [17, 18]. TPB has mainly been used to predict employees' intentions to contribute actively to online social media knowledge sharing, in settings such as higher education, health management and small-medium enterprises [19, 20]. To the best of our knowledge, the present study is the first to extend the use of this theory to the disaster management domain. We have grounded our conceptual model in this theory and have modified it by adding some constructs derived from other theories and from the extant literature. The other theories involved in this study are social cognitive theory (SCT), the technology acceptance model (TAM) and social exchange theory. The further explanation of these theories in this paper is followed by a proposed conceptual model, which is discussed in the literature section.

The remainder of this paper is structured as follows. In Section 2, the research methodology is presented. In Section 3, the extant literature and hypotheses development are discussed. In Section 4, the proposed conceptual model for social media-based knowledge sharing intention is presented. In Section 5, the paper concludes with some remarks regarding the implications of this line of enquiry for disaster relief organizations in Somalia and potential directions in further work.

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2. METHODOLOGY

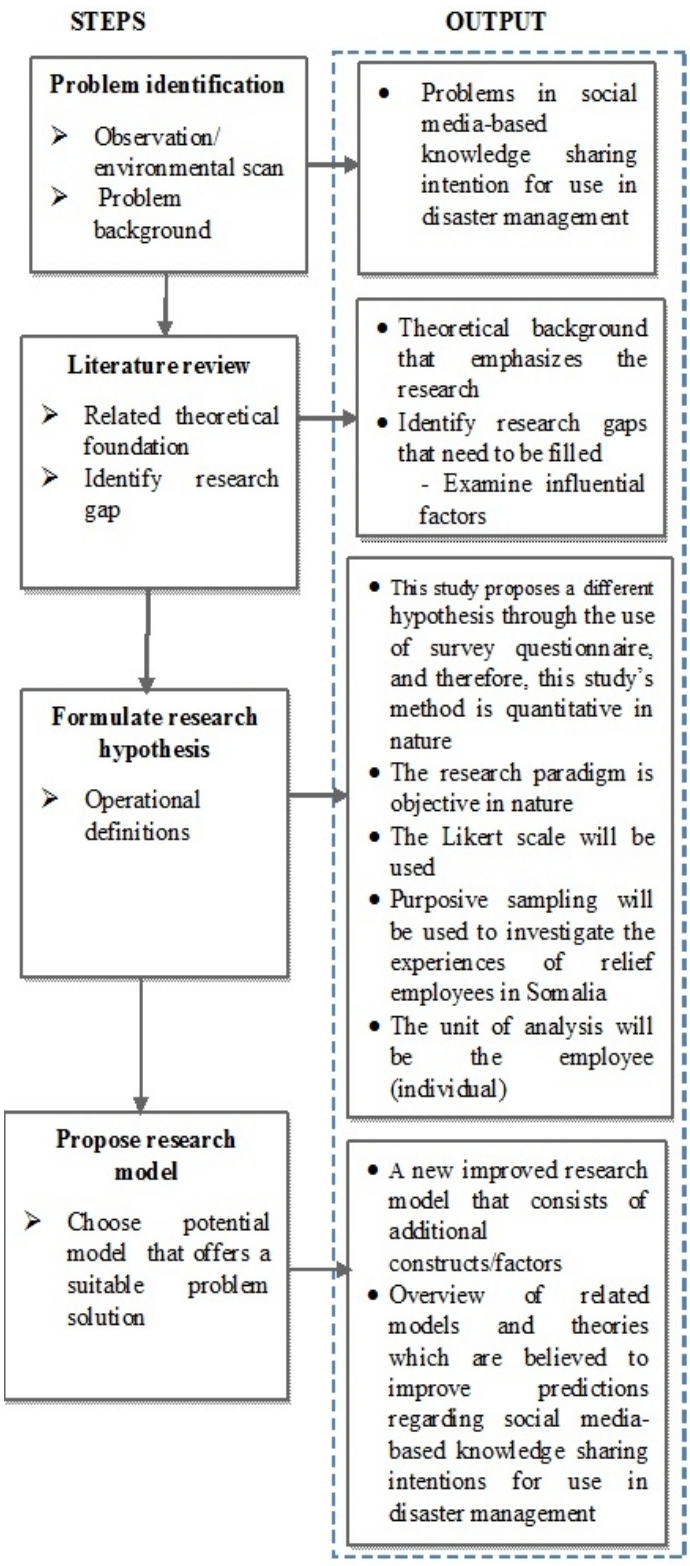

Figure 1: Research Methodology Map

The research methodology illustrates the details of several steps taken in order to produce this paper. The main purpose of this research is to study and review the knowledge management literature regarding social media-based knowledge sharing behavior in order to discover the key factors that govern knowledge contribution via social media during disaster management efforts. Relevant journal articles were downloaded from a range of databases, including Science Direct, Springer Link and SCOPUS. To help limit the scope of the search, this study reviewed only the research papers that discuss social media-based knowledge sharing intentions and that were published from 2004 to 2015.

Search approaches for information and knowledge sharing are interdisciplinary; therefore, in this study, the databases were searched using a combination of the following keywords: "intention to use", "social media", "knowledge sharing", "social media-based knowledge sharing intention to use" and "disaster management". In total, 70 papers were reviewed. Based on the results of this review, this study proposes a conceptual model of the three most influential factors in knowledge sharing behavior in disaster management.

3. HYPOTHESES DEVELOPMENT

Knowledge is an individual intellectual asset which an individual may be unwilling to share unless there is encouragement and facilitation to do so [21]. Knowledge is seen as a power which individuals may not like to distribute freely. In the personal context, individuals may have concerns about the circumstances in which to share or not share knowledge [6]. In the organizational context, knowledge sharing is a valuable asset and resource [21]. Increasingly, employees are asked to share their ideas, experiences and skills with others through computer-mediated online discussion forums. However, additional exploration is required in terms of understanding what motivates employees to share their knowledge via emerging technology, particularly in disaster relief operations. Several studies identify various factors that affect an employee's willingness to share knowledge via social media [22-24]. For example, these factors include interpersonal trust [13, 25, 26], social norms [13], organizational culture and management support [27], individual self-efficacy [28] and technology [13, 24, 29]. The present study focuses on organizational factors (i.e. management support), individual factors and technological factors to

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understand how these factors influence social media-based knowledge sharing intention during disaster management efforts.

3.1 Organizational Factors

The two fundamental dimensions of the social exchange theory are the organizational factors of management support and organizational rewards [30]. Management support is defined as "a global belief concerning the extent to which an organization values employee contributions and cares about their well-being" [31]. Managerial leadership plays a significant role in the success of employees' knowledge sharing [32]. The social exchange theory perspective explains management support and long-term interrelationships between groups, as well as between individuals, such as employees and leaders [33]. Top management's support and encouragement of knowledge sharing, and the promotion of individual willingness to share knowledge with others, has a positive influence on employees' attitudes towards knowledge sharing [5]. Studies have concluded that perceived support from supervisors and coworkers such as giving affirmative feedback and valuing contributions can enhance the quality of knowledge sharing and related facilities [34].

Based on the principles of social exchange, social media-based knowledge sharing is becoming an important technological tool for disaster management that enables information and knowledge to be freely exchanged through conversations and online interactions [2]. Researchers have investigated management approaches to support the use of social media for the construction of relationships and to encourage members to share their knowledge [35].

When utilizing social media for knowledge sharing within the disaster management domain, without top management support, employees may be unwilling to share information among themselves [36]. Earlier research showed that management supports can positively-influence an employee's attitude and subjective norms towards knowledge sharing. An example of this could be management supporting employees by providing suitable resources, training and incentive rewards, and removing barriers to knowledge sharing functions. This may encourage employees to develop positive attitudes towards sharing their knowledge with others within the organizational context [27]. Therefore, the following hypotheses were formulated:

H1a- Management support positively affects users' attitudes towards social media-based knowledge sharing.

H1b- Management support positively affects users' subjective norms towards social media-based knowledge sharing.

To encourage employees to share their knowledge with others, the organization may provide various forms of rewards. These can include increased pay, bonuses, job security, respect and status [37]. From this perspective, individuals may share knowledge when the benefits outweigh the costs of knowledge sharing, or when the results meet expectations [38]. Liao, To and Hsu [39] argued that knowledge sharing can be considered a form of social exchange, whereby people who share knowledge expect the same future return from their activities.[40] explained that, from the social exchange theory perspective, each person engages in social interaction by considering the costs and benefits of any action before deciding what to do. [41] found that people can be assumed to evaluate the benefits of their knowledge sharing with others before they make decisions. [42] noted that knowledge sharing in disaster management is different from knowledge sharing within stable business organizations. This is because, within the disaster management environment, individuals who are required to work together as a team often have no prior experience of working with each other. Paton [41] highlighted that, within such a situation, people are more motivated to share their knowledge with others if they expect some reward in return as a result of sharing the disaster-related information.[43] found that rewards are often used as a tool to encourage employees to be willing to share knowledge and interact more with others. Similar research claimed that rewards are useful for motivating employees to adopt a positive attitude towards knowledge sharing with others [28]. Therefore, this study developed the following hypothesis:

H2- Organizational rewards positively affect users' attitudes towards social media-based knowledge sharing.

3.2 Individual Factors

SCT has been applied within the field of IS research as a means of examining an individual's behavior. It defines individual behavior as dynamic, triadic, and as the social interaction of personal factors, beliefs and surrounding environments [44]. SCT postulates two combined factors that can influence individual behaviors in regard to the

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decision to either perform or not perform certain actions. These factors are personal recognition, including self-efficiency and outcome expectations, and environmental factors such as trust [44, 45]. The outcome expectation is defined as "a judgment of the likely consequences that will be produced by performance", whereas self-efficacy is "a judgment of one's ability to organize and execute given types of performance"[45]. Within the context of social media knowledge sharing, SCT argues that factors such as self-efficacy, outcome expectation and trust play an important role in influencing online knowledge sharing [19, 46, 47]. The outcome expectation factor is excluded from this study.

Self-efficacy is described as a person's belief that they possess the capacity to act in a particular manner [48]. Self-efficacy can be deemed to be a self-motivator. People who are highly confident of their abilities to share beneficial knowledge are more inclined to impart that knowledge to others with the certainty that the knowledge they share will help to resolve issues or improve performance [39]. Within the disaster management context, knowledge self-efficacy reflects an individual's capabilities for knowledge sharing behavior. This is because, during disaster management efforts, online chats and interactions on social media enable users to exchange information, to share knowledge that they possess with others in a timely manner, and to receive feedback [49]. Consequently, employees who have high self-efficacy are more willing to share their knowledge with others than those with low self-efficacy [50]. As previous researchers have shown, self-efficacy can influence an individual's attitude towards social media-based knowledge sharing [22, 28, 47]. This led to the following hypothesis:

H3- Self-efficacy positively affects users' attitudes toward social media-based knowledge sharing.

Since disaster management is underpinned by reciprocity, mutual trust and a willingness of individuals to share knowledge with others, it is important to recognize that employees may have different reasons for deciding whether or not to share knowledge [7]. Researchers have identified that these types of knowledge sharing can occur only when people trust one another. With this trust they tend to cooperate with each other: an action that lies at the heart of knowledge sharing [51]. Trust can be defined as "the willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other party will perform a particular action important to the trust or, irrespective of the ability to monitor or control that other party"[52].

Trust is a much-debated factor that consistently facilitates knowledge sharing between two parties [53]. Within the context of online social media-based knowledge sharing, trust is an initial condition required by communities to participate and share their ideas and opinions. The existence of trust plays an important role in encouraging knowledge sharing among members [25]. Knowledge is usually classified either as explicit knowledge or tacit knowledge. Explicit knowledge is coded and documented, and it may be transferred in impersonal ways. Tacit knowledge is hard to express, especially with reference to cause and effect relationships. However, trust is built on the tacit knowledge exchange of individual or coordinated information. Online communities are the cornerstone for the building of trust during disaster relief efforts because, in times of disaster, people will turn to these communities for interpersonal and emotional encouragement [54]. According to the literature, trust may positively influence users' attitudes toward social media knowledge sharing [13]. This led to the following hypothesis:

H4- Interpersonal trust positively affects users' attitudes towards social media-based knowledge sharing

Enjoyment in helping others refers to a willingness to help others without expectation of a return [22]. In a review of the literature on knowledge sharing, enjoyment in helping others is described as altruism [5]. Altruism is defined as "voluntary helping actions where one attempts to improve the welfare of others at some cost to oneself" [55]. In the disaster management knowledge sharing literature, both a drive to help others and social interaction are reported to significantly enhance online knowledge exchange and increase the willingness of individuals to share their knowledge freely and without expectation of reciprocity during a disaster event [56]. In the literature on the disaster environment, helping others occurs in situations which present a threat of harm that requires an action in order to save a human life and protect property, and also requires immediate interventions[21]. Consequently, this study employed the concept of enjoyment in helping others as an antecedent of the factors that affect an individual's attitude towards social media-based knowledge sharing. This led to the following hypothesis:

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H5- Enjoyment in helping others positively affects users' attitudes toward social media-based knowledge sharing.

3.3 Technology Factors

Increasingly, disaster relief agencies and other organizations are seeking to speed up their knowledge sharing processes. In order to obtain their goals, they must understand the factors that influence knowledge sharing, and the type of technology that is relevant at an individual level. Technology is playing an increasingly important role in all phases of disaster management, that is, in the pre-disaster, disaster and post-disaster phases [57]. In the case of new technology, such as online social media, users can easily create and edit new knowledge, post questions and answers, participate in discussions, and share experiences. Social media provides many potential benefits and promises widespread access to its applications [9].

A variety of perceptions related to systems use have been related to motivations to act [58]. Of the several IS theories that have been used to address user behavior towards the application of new technology, one of the most popular is the TAM introduced by Davis [59]. The TAM proposes that two particular beliefs, namely, 'perceived usefulness' and 'perceived ease of use', can influence a person's attitude towards using a system. In this study, these two factors were adapted from the TAM to explore the use of social media-based knowledge in disaster situations.

Perceived usefulness is a motivation that comes from outside the user, and is described as the extent of an individual's belief that work performance can be improved if a certain system is employed [59, 60]. The TAM maintains that a belief in usefulness, for instance, can have an influence on the attitude of the user [59]. From the viewpoint of an individual who intends to share their knowledge, the perceived usefulness of sharing that knowledge should increase to the point where the individual's contacts are also motivated to share that knowledge and express their thoughts[6]. Prior research has confirmed that the perceived usefulness of knowledge sharing through social media can have an effect on users' attitudes [13]. Accordingly, it was hypothesized that:

H6- Perceived usefulness positively affects users' attitudes toward social media-based knowledge sharing

Perceived ease of use is defined as an individual's evaluation of the degree to which interaction with a particular information system or technology entails no mental exertion [59]. It is one of the primary behavioral beliefs of both the original and revised versions of the TAM which determines the attitudes of users who employ technology [61]. According to earlier studies, individuals are more inclined to use a new technology once they sense that it is easy to use [13]. Previous studies have confirmed that perceived ease of use has a significant influence on users' attitudes towards social media-based knowledge sharing [13]. In the knowledge sharing context, PBC for knowledge sharing behaviors is highly associated with perceived ease of use, which is influenced by the knowledge workers perceptions involved in the knowledge sharing task [18]. Therefore, we hypothesized that:

H7a- Perceived ease of use positively affects users' attitudes toward social media-based knowledge sharing.

H7b- Perceived ease of use positively affects users' perceived behavioral control towards social media-based knowledge sharing.

3.4 TPB Constructs and its Beliefs

TPB [17] is an extension of the TRA and is well-known within the context of social psychology in human behavior. TPB has been shown to be effective in forecasting and describing the intentions and behaviors of people across a range of information technologies [62, 63]. The TRA is based on the assumption that personal behavior is a fully-controlled, conscious choice of will [14]. The TPB posits that people are not fully in control of their behaviors. Its inclusion of PBC as an additional factor enhances the predictive capabilities of the theory. As suggested by TPB, individual behavioral intentions are determined in a large part by attitudes, subjective norms and PBC [64]. Attitude herein refers to an individual's positive or negative feelings or evaluations regarding the performance of particular behaviors [17].

The positive relationship that exists between attitude and behavioral intention, within the context of knowledge-sharing, has been verified by many studies [18, 65]. Previous studies have shown that a positive attitude towards knowledge sharing will result in a positive intention to share knowledge [66]. A subjective norm refers to "the perceived social pressure to perform or not perform the behavior" [17]. [19] found that a subjective norm has significance regarding a user's intention within the context of online knowledge sharing. Previous research has found that subjective norms regarding

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knowledge sharing positively influence an individual's attitude towards knowledge sharing [18]. The apparent ease or difficulty related to behaving in a particular manner, and the degree of control that is maintained by an individual over the attainment of personal goals, is referred to as PBC. This serves as the criterion for sharing knowledge, because an individual will only feel that they are in total control of a behavior when they realize the ease of sharing knowledge [67]. In the context of knowledge sharing behavior, several earlier studies have acknowledged that PBC is one of the influential factors that directly affect users' intentions to share online knowledge [66, 68]. Therefore, the following hypotheses were developed:

H8- Attitude positively affects a user's intention to use social media-based knowledge sharing.

H9- Perceived behavioral control positively affects a user's intention to participate in social media-based knowledge sharing.

H10a- Subjective norms positively affect a user's intention to participate in social media-based knowledge sharing.

H10b- Subjective norms positively affect a user's attitude towards social media-based knowledge sharing.

4. RESULTS

Proposed conceptual model of research: Regarding what motivates employees to participate in social media-based knowledge sharing for work purposes during disaster management, this study offers a conceptual model for assessing the factors that facilitate voluntary social media-based knowledge sharing intentions, for use within disaster management. Based on the literature review, Figure 2 illustrates the proposed research model which presents three groups of independent variables, namely, organizational factors, individual factors and technology factors, and dependent variables, namely, the TPB constructs. A summary of the research on each factor along with the relevant reference is presented in Table 1. The proposed conceptual model is a preliminary work which will be extended in further statistical work in the next phase

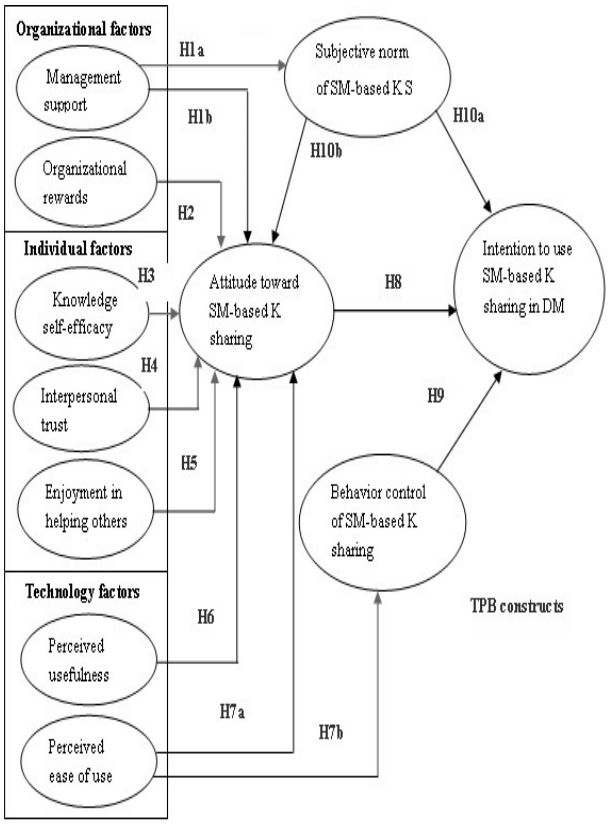

Figure 2: Conceptual model of Rresearch

Significance of the study: Based on the growing significance of social media knowledge sharing activities within disaster management as a knowledge sharing propagator, several researchers have called for further investigations in order to determine the main factors that shape social media-based knowledge sharing behaviors within the disaster management domain. On the other hand, MS-based knowledge sharing has been used on both individual and organizational levels, for the purpose of sharing and disseminating disaster knowledge. Consequently, conducting research in this area is important for understanding what factors facilitate the voluntary intentions of employees to share their knowledge via social media, since knowledge sharing among employees cannot be forced but only encouraged.

The significance of this study within the context of Somalia is two-fold. Firstly, Somalia has experienced natural disasters including floods, tsunamis, cyclones and droughts along with conflict and violence during the last two decades. However, the management of disaster in Somalia has received little attention and aid. There has been poor knowledge sharing by relief organizations on the ground [69]. According to Cooley and Jones [70],

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both the UN Somali and the African Union Mission to Somalia (AMISOM) have used social media outlets to spread disaster information, and to both garner support and encourage aid from relief organizations and countries. Furthermore, more parts of Somalia's society are now using social media tools (see sahanjournal.com/Somalia-social-media/). However, there is still an information-sharing barrier between local and international relief organizations working in the country, as well as with organizations and countries around the world. Therefore, improving willingness to share knowledge with others may help disaster relief organizations to improve their work and even save lives. Secondly, in natural disasters such as the ones that occur in Somalia, social media-based knowledge may arguably provide a voice for getting help to those people living in the affected area. As a result, this study has important implications within the context of disaster management particularly in countries like Somalia.

Table 1: Factors Influencing Knowledge Sharing in Social Media Research

Type	Influential factors	Indicative literature
Organizational factors	Management support	[32], [5], [36]
	Organizational rewards	[5], [39]
Individual factors	Perceived self-efficacy	[46, 47], [24], [50]
	Trust	[47], [25], [13]
	Enjoy helping others	[18], [28]
Technology factors	Perceived usefulness	[29], [13], [46], [22]
	Perceived ease of use	[29], [13], [46]
TPB constructs	Attitude	[62, 63]
	Perceived behavioral control	[18] and [67].
	Subjective norms	[19] and [18]

5. CONCLUSIONS

During disaster management, knowledge is shared among different employees, organizations and departments at many levels, and requires their expertise, skills and experienced knowledge regarding the disaster management issues. Sharing or not sharing knowledge with others is the result of individual behavior. This study has reviewed the literature in this area by focusing on social media-based knowledge sharing behaviors and combinations of organizational factors, individual factors and technology factors. Based on the literature, this study aimed to build a model for analyzing how these factors affect employees' knowledge sharing intentions via the use of social media in disaster management. The model proposed in this study is based on the TPB, SCT, the TAM and social exchange theory.

Considering the limitations of this study, three suggestions are made for future research. Firstly, although the literature reviewed in this study generally supports the research hypotheses, a statistical test was not conducted. To address this limitation, further research is needed to obtain primary data regarding the views of the respondents who participated in this study. Therefore, building the questionnaire items from the literature is the first step that needs to be undertaken in order to measure the behavioral model in terms of intentions to use social media-based knowledge sharing. Secondly, the data collection in this study was limited to social media knowledge sharing behavior within relief organizations in Somalia. Due to cultural differences, other research should be conducted in similar countries in order to compare the results obtained from statistical studies. This may improve the reliability of the research instrument to be used in this study. Finally, in this study, the factors that influence social media-based knowledge sharing behavior were limited to organizational, individual and technology factors. With the goal of better understanding the factors that influence social media-based knowledge sharing behavior, there may be other factors such as social influence factors that should be considered. Thus, it is recommended that further studies should examine factors related to cultural diversity in disaster management environments and the surrounding actual behaviors of participants in social media-based knowledge sharing.

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