

# User Acceptance of Emergency and Disaster Response Mobile Application in the Philippines: An Investigation Based on the Unified Theory of Acceptance and Use of Technology Model

Markdy Y. Orong, College of Computer Studies, Misamis University, Ozamiz City, Philippines

Alexander A. Hernandez, College of Information Technology Education, Technological Institute of the Philippines, Manila, Philippines

## ABSTRACT

Emergency and disaster situations continue to rise in all parts of the world, especially in the most risk-prone countries such as the Philippines. However, emergency and disaster response applications in a smartphone in the Philippines are underrepresented in literature. This study measures the acceptance level of the recently launched emergency and disaster response applications in a smartphone for citizens, through a survey conducted based on the Unified Theory of Acceptance and Use of Technology model. Results show that the majority of the respondents were female who belong to age 18-23 years old. Most of the respondents do not know about the emergency and disaster response application and its capability. However, the majority of the respondents are willing to use the emergency and disaster response application and are motivated to share the capabilities of the application with their families and friends. Most of the respondents are learning the application for the first time. The correlation results of effort expectancy that influences behavioral intention shows significantly among other indicators that correlate to behavioral intention. Moreover, gender showed a significant influence on the facilitating condition to behavioral intention. On the other hand, age does not show significant influence on facilitating condition, social influence, effort expectancy and facilitating condition to the behavioral intention of use. Thus, this work offers research and practical implications for developing countries, and other economies.

## KEYWORDS

Disaster Response, Emergency Response, Mitigation, Philippines, Security, UTAUT, Vulnerability

## 1. INTRODUCTION

Emergencies and disasters remain a challenging situation in several countries worldwide due to recurring meteorological, physical infrastructure, and human-related factors, among others. However, there is a need to reduce the impacts of disasters and emergencies in a sustainable manner in which information technology solutions is used as one of the approaches to mitigate these situations (Mal

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et al., 2018; Alexander, 2017). To date, there are emergency management technology solutions to respond to victims, connect public and private agencies in real-time, and reduce potential impacts of disasters to human life and physical infrastructure, and the environment (Lei et al., 2018; Foresti et al., 2015). For instance, mobile application with capabilities on supporting the needs of first responders in the field and citizens with smartphones for public safety as well as implement mission-critical mobile applications that coordinates with law enforcement, fire department, and emergency response authority during these situations (Nyaung and Yamaguchi, 2018; Han et al., 2016).

The use of mobile-based solutions for emergency and disaster response offers benefits to various stakeholders. First, mobile-based emergency offers a way to reducing response time through geographical position systems (GPS), real-time disaster information and early warning features (Maryam et al., 2016). Second, detect potential risks such as on explosive materials, fire, earthquake, and tsunami as well as other location-based or surrounding events (Alcaindo et al., 2017; Kong et al., 2016; Minson et al., 2015). Third, assists emergency responders to locate missing persons through the stored user information in mobile phones and servers (Annadata et al., 2016). Lastly, use of crowdsourcing features to estimate affected citizens, allocate resources needed to effectively respond to the victims, through recorded images and videos (Ludwig et al., 2017; Horita et al., 2013). Thus, mobile-based solutions offer substantial benefits to reduce the impact of emergency and disasters on human life and infrastructure.

However, the use of mobile-based solutions for emergency and disaster response systems is still underrepresented in developing countries, such as from the Philippines. To date, no study has been done to explore the use of mobile-based solutions for emergency and disaster response in the Philippines. Also determining the user acceptance of the technology was not determined to gain insights as to the acceptability of the application in the country. Hence, this study determines the user's acceptance level on a newly developed mobile application solution, with greater emphasis on the user demographics, user knowledge, experience, application awareness and willingness to utilize the technology for emergency and disaster situations using the Unified Theory of Acceptance and Use of Technology (UTAUT) model, through a survey conducted in the Philippines.

Thus, this study has impacts for the Philippines and other developing countries.

This paper is outlined in the following sections. First, a review of literature is presented on the emergency and disaster, state and challenges in the Philippines. Second, the materials and methods used in the study. Third, the data analysis and discussion, and implications are presented. Lastly, the conclusions and future works.

## **2. LITERATURE REVIEW**

### **2.1. Emergency and Disaster Challenges in the Philippines**

The Philippines is ranked third in the world for exposure to disasters and emergencies (Medina, 2016). It was reported that the Philippines incurred a USD 7.893 million equivalent to 69% of social expenditure in the country (Alcayna et al., 2016). In the past decade, the Philippines is cited prone to emergencies resulting in thousands of fatalities annually (Labrague et al., 2016). A recent study found that an average of growing number of reported emergencies happens in 24 hours ranging from health, vehicular, and environment-related concerns (Acosta et al., 2016). Annually, around seven million were victims reported from all types of disasters and emergencies (Zorn, 2018). To date, fatalities keep on rising due to physical and environment, metrological, infrastructure, and human-related factors, among others.

However, the emergency and disaster situations in the Philippines presents several challenges ranging from hazards, vulnerability, and risk assessments, early warning systems and evacuations, capacity building for disaster preparedness, response and relief operations, rehabilitation, recovery, and reconstruction, among others. First, hazards, vulnerability, and risk assessments is a present challenge

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