

Universiti Teknologi MARA

**Multi-user GPS Tracker-based Disaster
Management App for Response and
Rescue Operations of NGOs**

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ABSTRACT

Disaster management is an important element in dealing with the impact of disasters worldwide. A well prepared disaster management is determined by the quickness of response towards the situation and the effectiveness of resource distribution to the affected areas. Government agencies and humanitarian NGOs are among the common parties responsible for disaster management. However, compared to the government agencies, humanitarian NGOs lacks the technology to support them in their response and rescue mission during the disaster occurrence. Therefore, the aim of this project is to design, develop and test a proof-of-concept of a multi-user GPS tracker-based mobile application specifically to assists the Response and Rescue (R&R) operations of NGOs. A multi-user GPS system approach is used in this project to allow the tracking of multiple NGO deployed units at the same time on the map to improve the coordination of the rescue operations. The software development approach is the methodology employed in this project, and consists of five major phases, which are problem analysis, design, development, testing and evaluation. The prototype has been successfully developed and installed on Android devices by using cloud-based repository and open source location based tracking code to apply multi-user tracking. The testing was conducted by observing multiple Android devices set up at different locations to test the accurateness of the coordinates of each device on the map. The results showed positive outcomes as the coordinate of the devices and the location markers shown on the map was accurate. The devices are able to track each other for up to four users in real-time on the map which successfully achieved the main objective of the project. From this research, we hope this mobile application will give a significant improvement to the response and rescue mission of NGOs and save more lives.

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CHAPTER 1

INTRODUCTION

This chapter will cover the details of the project which includes the background of the project, the problem statements, the objectives, the scope, the significance, focusing elements and the expected outcome of the project.

1.1 Project Background

Disaster can occur anywhere across the globe. It may come in various types such as storm, tsunami, earthquake, flood and many more. Overwhelming economic losses, large affected populations and severe environmental damages are the potential results that arise during and post-disaster (Galindo & Batta, 2013). In this case, a proper disaster management plan is always needed to tackle the issues. However, disaster management plans are frequently facing many difficulties. The reason for this project is to assist the emergency response and rescue team to handle these difficulties which will be explained more in detail in the problem statement section.

With the advancement of technology nowadays, smartphones users have been increasing rapidly. Smartphone users are everywhere, used daily and are always connected (Chatzimilioudis, Konstantinidis, Laoudias, & Zeinalipour-Yazti, 2012). Furthermore, smartphones are very reliable, multi-purpose, and comes in various platforms. In the issue of emergency management and disaster response, the mobile technologies and social media has allowed the victims in disaster area to share real-time information of the local event (Poblet, García-Cuesta, & Casanovas, 2014). The government agencies, humanitarian NGOs,