



UNIVERSITI TEKNOLOGI MARA

**WALKING STICK ASSISTANT FOR VISUALLY IMPAIRED
PEOPLE WITH IoT**

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ABSTRACT

Visually impaired person have difficulty to interact and feel their environment since they have little contact with surroundings which they intend to move to anywhere busy place. These problems of visually challenged people can be addressed with the technology given by using IoT hardware and link with each other by using application software on smartphone. This report aims to design a Smart Walking Stick by using Arduino D1 WEMOS Microcontroller with a combination of Blynk application. These project explains that smart walking stick also helps to guide visually people without burdening other people too. So, this project divided into four parts such as electronic component, electrical device, computer software and a hardware mechanical design. Since Arduino D1 WEMOS is used as microcontroller board, ultrasonic sensor has been used to detect any obstacles, push button as an emergency button and temperature humidity to read surrounding temperature and alert the user. For the output, light emitting diode (LED) are used as a signal to show and alert the user's guardian if there is an emergency incident occurs, buzzer to notify the blind people if there is an object appears in front of them and LCD to display the temperature of surrounding. So, the results will be displayed on smartphone of the user by using Blynk application. The model discussed here is convenient and affordable smart walking stick equipped with various of IoT sensors, this model will help the visually challenged people to become more alert and also monitor whereabouts of the user to concerned people using tracker location (Blynk application) so that the safety of the users are guaranteed. The complete model is developed and the performance is reported.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

According to National Library of Medicine (NLM), in 2015, there were an estimated 253 million people with visual impairment worldwide. Of these, 36 million were blind and a further 217 million had moderate to severe visual impairment (MSVI). The prevalence of people that have distance visual impairment is 3.44%, of whom 0.49% are blind and 2.95% have MSVI. Vision is one of the most important part of the human body for humans to survive seems it can help to connect with the surrounding. People deprived of vision usually rely on other dependencies such as simple walking stick or guidance from people. They may memorize their way of direction but they never know if they have obstacles or not in front of them. However, it is not safe for the visually impaired to rely on their memory to move one place to another since the danger can be appear out of sudden. Not just that, not all the time visually challenged people are offered help from others since some of them are too busy. Hence, visually impaired people need a device or so called smart walking stick that can assist them in all type of form which will make them become easier and convenient.

The main characteristics for the stick to be useful to every visually impaired person is for it to be efficient and cost effective. The obstacles such as people, vehicles, stones in the outdoors and stairs, walls, furniture in the indoors hinder the way of the blind. To address this limitation, the smart blinding stick is developed which focuses on integration of Arduino and Internet of Things (IoT) technologies to alerts the user about various obstacles through a vocal sound from a buzzer on walking stick. Then, the features of walking stick is that it can locate the smart walking stick using the application by having Wi-Fi module. The combinational of Arduino's microcontroller capabilities and IoT's connectivity and data processing potential offers a promising solution that can enhance more user's protection and convenience.

The main objectives of this project is that to design, develop & implement a smart walking stick with IoT hardware by using Arduino UNO as a microcontroller and display the results by using application on smartphone in which will be easier for the user to track the location of a smart walking stick. Next aim is to develop & implement the software coding using Arduino IDE as well as circuit simulation on Proteous to make sure the simulation of this project run smoothly without any error. This could