**Universiti Teknologi MARA**

# (B-Savior) Smart Backpack Development based on IoT using Arduino and Mobile Application

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# ABSTRACT

Nowadays, backpacks are a useful tool in a lot of areas, they can contain clothing, school supplies, electronic equipment, medicine or any personal stuff. One of the biggest problems is that they can be stolen easily, and sometimes the things inside could be very expensive and important to the user. Thus, this project's purpose is to provide a new unique and innovative way to improve backpack's users experience specifically in new modern lifestyles and Internet of Things (IoT) technology. B-Savior Smart Backpack is a smart application of IoT that offers the user security and new technology compare with the common backpack. The aim of this project is to develop a smart backpack based IoT using Arduino and mobile application that can secure the owner's belongings in the backpack everywhere and every times from being stealing or missing. This project will be using the android platform for developing mobile application. The target user of this project would be student who study in UiTM Shah Alam that required backpack security, and who love to travel in Malaysia that required backpack security during travel. Internet of Things Design Methodology and Mobile Application Development Lifecycle (MADLC) are the approach employed to complete this project. The technology utilized in this project are Arduino UNO as the microcontroller of system, LSM303 Breakout Board Accelerometer & Magnetometer sensor (Compass) for making detection when the backpack was moved for certain degree and HC-05 Bluetooth Module for transmitting data for integrate with mobile application. In a nutshell, B-Savior Smart Backpack able to explore the new experience of the user which is student with the emergence of advanced technology in education environment. The future works will be focusing on reconstruct the coding for LSM303 Breakout Board, a combination of Accelerometer and Magnetometer sensor (Compass) to make a precise sensitivity for sensor, replace the 9V Battery power to Power Bank that consist more power and built the resistance box to put in the component system and tight attacheable for the smart backpack.

**Keywords**: Backpack, Smart Application, Internet of Things, Android, Security, Arduino, Anti-theft Technique, Bluetooth System, Mobile Application Development Lifecycle.

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# CHAPTER 1

# INTRODUCTION

## Chapter Overview

This chapter clarify on research background such as the problem statement, aim, objectives, scope, limitation, and significance of the project. The background of the project will give an overview to readers on what the project is all about. In addition, the problem statement refers to the current issues identified adherence to the need of the project. For the project aim is aiming what the project will be develop. Besides, the objectives of the project stated the target and outcome of the project. Last but not least, the scope is justified, the limitation is been listed as there are difficulties for the project and the significance of the project is discussed.

## 1.1 Project Background

The “Internet of Things” (IoT) is a phrase that was first used in 1999 by Kevin Ashton while he was working at MIT’s Media Center. He meant it to represent the concept of computers and machines with sensors, which connect to the Internet to report status and accept control commands (Donald, 2015). There are a lot of IoT features, designs, products and applications after since then.

Nowadays, backpacks are a useful tool in a lot of areas, they can contain clothing, school supplies, electronic equipment, medicine or any personal stuff. One of the biggest problems is that they can be stolen easily, and sometimes the things inside could be very expensive and important to the user. This project is developed to solve the problem technologically, integrate some other smart features and incorporate a way in which the owner can interact directly by using their