

**UNIVERSITI TEKNOLOGI MARA**

**PERFORMANCE OF BLUETOOTH  
COMMUNICATIONS IN  
WIDESPREAD SYSTEMS**

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## ABSTRACT

Nowadays, implementation of the tracking system has become a common issue in modern technology due to the advantages of detecting the location of the object. Things are commonly tracked via follower based next to the implementation of RFID, GPS, and GSM imply strength. This method commonly requires line-of-sight operations and limited coverage for accessing signal strength. In this paper presents a performance of Bluetooth using two Arduino as a Beacon, personal smartphones as an object, Graphical User Interface (GUI) using MIT APP was built in smartphone to display the system accessibility network detection by Bluetooth's Service Discovery Protocol (SDP). The Bluetooth system performance is observed between two Bluetooth devices using the hardware testbed (Arduino & MIT Apps development) and software simulation (OPNET) and analysed in terms of types, signal strength, with and without wall and separation distance from 0 meter up to 100 meters, which were measured against range, strength, interference, connection establish, through put, packet drop, packet delay and etc. The findings show that the transmission disconnected and drop varies exponentially with the kinds of environment and separation distance. Purpose of this research to check how far and what is the main influence in localization indoor environment. As a result after multiple scenario been done, it could be say that bluetooth for child and object tracking into building it still effective and reliable without much cost to purchase the devices compared with Wi-Fi connection where required to have a SSID and password from the management mall office same goes to the telco for GPRS tracker which is some building the coverage for 3G and 4g is very poor and offline.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Research Background

Bluetooth is a technology that has been developed more than twenty years ago. It was 1994 when the first draft of data transmission that would become part of the digital modem ecosystem was presented. Nowadays, this technology is one of the pillars of the Internet of Things (IoT).

Is a worldwide wireless standard that enables connectivity for an extensive variety of electronic gadgets extending from cell phones to gadgets, PCs and beacons? Bluetooth innovation eliminates the requirement for a cable connection between gadgets by connecting them over short separations (up to 100m) utilizing short-wavelength radio transmissions in the unlicensed modern, logical, and restorative (ISM) band from 2.4000 to 2.4835 GHz.

Bluetooth is one of the most efficient short distance wireless communication devices in our daily lives. With its stability and convenience in communication, this has allowed Bluetooth technology to become a valuable asset for both computers and electronic communication. It was first developed by a group called Bluetooth Special Interest Group (SIG) which formed by elite companies such as Ericsson, Nokia, Intel, IBM and Toshiba in May 1998. Bluetooth technology was officially approved in the summer of 1999. Since then the creation of Bluetooth wireless communication is widely used in various electronics and has been expanding every day. Starting from communication between mobile phones and computers, Bluetooth has expanded to enable communication between such forms as headsets, printers and automobiles. Bluetooth is a combination of hardware and software technology, running on a hardware radio chip and utilizing software to provide the main control and security protocols. By using this newer hardware and smarter software algorithms to direct network data we can achieve more efficient, flexible and secure wireless communications. The future is geared towards wireless communication as the cables seen on desktops are slowly becoming obsolete. The movement towards Bluetooth is rapidly rising