**CHAPTER** **1**

**INTRODUCTION**

* 1. **Introduction**

The Internet of Things(IoT) are the devices which help to connect to the internet and able to control all electronic and mechanical devices. In IoT, a large number of tiny data blocks from device, such as various sensors are transferred across networks. Although Internet Protocol(IP) has been adopted for most types of communication, it will have some problems when it is applied to IoT. Currently, Internet access requires application protocol over TCP/IP or UDP/IP. One of the application protocols is Hyper Text Transfer Protocol(HTTP), which has been standardized in IETF and has been applied for general communication over Internet. It is request/response paradigm where each device connects directly to the IoT Agent. However, when HTTP is applied to communication in IoT in which a huge number of tiny data blocks are transferred, protocol overhead and resulting performance degradation are a serious problem.

Moreover, IP addressing depends on physical location which causes the problem of complexity of network control. MQ Telemetry Transport(MQTT) is one of the protocols that reduces protocol overheads and provides high efficiency communications for IoT. It is a publish-subscribe based messaging protocol used in the internet of things for distributed, collaborative, hypermedia information systems that allows users to communicate data on the W

orld Wide Web. It is different in that publish/subscribe is event-driven and pushes messages to clients. It requires an additional central communication point(known as the MQTT broker) which it is in charge of dispatching all messages between the senders and the rightful receivers. Each client that wants to receive messages subscribes to a certain topic and the broker delivers all messages with the matching topic to the client. Therefore, the clients don’t have to know each other, they only communicate over the topic. This architecture enables highly scalable solutions without dependencies between the data producers and the data consumers.

This project discusses the possibility of considering MQTT as a candidate for the communication protocols on the IoT platform. It compares the performance of MQTT with that of HTTP. Moreover, it proposes new mechanism to enhance the current MQTT specifications. It describes the broad comparison among HTTP and MQTT to introduce their characteristics comparatively, Afterwards, it describes their strengths and limitations. The purpose of this project is based on these evaluation, the users can decide their appropriate usage in various IoT systems according to their requirements and suitability.

**1.2. Aims and Objectives**

The aims of this project are:

* To introduce the characteristic of MQTT and HTTP comparatively.
* To introduce the use of the MQTT and HTTP protocol across IoT platform.
* To investigate the pros and cons of the widely accepted and MQTT and HTTP protocols for IoT systems to determine their best-fit scenarious.
* To demonstrate an in-depth and relative analysis of MQTT and HTTP.
* To reveal their relative analysis of strengths and limitations.
  1. **Scope of Thesis**

The scope of the system is to improve the operational efficiency of the handling MQTT and HTTP data and information and to easily examine the effect of MQTT and HTTP on IoT platform. The purpose of this system will make it easy for the users by a wide range of comparison among MQTT and HTTP. A typical use case of IoT systems is many sensors publishing data to a broker. In this thesis, the majority of the system is to emulate the comparison facts of MQTT and HTTP on a Raspberry Pi and ESP8266(WiFi-Module).

**1.4. Outlines of Thesis**

This Project is composed of five chapters. Chapter one includes introduction to this system and the purpose of developing this project. Chapter two includes theoretical background of building this project and the explanation of system requirements. Chapter three includes the details of flowchart and Chapter four includes about the tests and results of using the system. Chapter five is about the conclusion.