

GREENHOUSE CONTROL AND MONITORING SYSTEM

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SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Computer Science (Computer System & Networking) With Honors.

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Pada zaman moden ini, orang mula menggunakan teknologi moden dalam kehidupan harian mereka dan dalam banyak sektor untuk meminimumkan kerja dan memaksimumkan pengeluaran mereka. Terdapat pelbagai jenis sistem yang sedang dilaksanakan di sektor pertanian. Dalam projek ini, satu sistem akan dibangunkan untuk memantau dan mengawal suhu rumah hijau. Suhu rumah hijau yang menggunakan sistem ini akan dipantau dan dikawal dari jauh. Pengguna akan menerima mesej kecemasan pada telefon bimbit mereka apabila suhu sekitarnya adalah luar biasa. Ia boleh dikatakan bahawa pengguna tidak perlu mengupah pekerja untuk berada di rumah hijau untuk memantaunya. Oleh itu, projek ini bertujuan untuk mengkaji sistem rumah hijau yang sedia ada dan membangunkan sistem rumah hijau baru yang menyediakan sistem pemantauan dan kawalan suhu dengan harga yang berpatutan. Pembangunan Aplikasi Rapid (RAD) dipilih sebagai metodologi yang digunakan untuk membangunkan sistem ini. Metodologi RAD melibatkan empat peringkat utama termasuk perancangan keperluan, reka bentuk pengguna, pembinaan dan pemotongan.

ABSTRACT

In modern days, people started to use modern technology in their daily life and in many sector to minimize their work and maximize their production. There are various kinds of systems that are being implemented in agriculture sector. In this project, a system will be developed to monitor and control the greenhouse temperature. The temperature of the greenhouse that used this system will be monitored and controlled remotely. User will receive an emergency notification to their cell phone when the surrounding temperature is unusual. It can be said that user did not have to hire a worker to stay at the greenhouse to monitor it. Thus, this project aims to study existing greenhouse system and develop a new greenhouse system which provides an affordable temperature monitoring and control greenhouse system. Rapid Application Development (RAD) is chosen as the methodology used to develop this system. The RAD methodology involves four main stages which include requirement planning, user design, construction and cutover.

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LIST OF ABBREVIATIONS

RAD	Rapid Application Development
GCMS	Greenhouse Control and Monitoring System
IoTs	Internet of Things
Wi-Fi	Wireless Fidelity
Mph	Miles per hour
BTu	British Thermal unit
SMS	Short Message Service

CHAPTER 1

INTRODUCTION

1.1 Introduction

Today, the growing of Internet of Things (IoTs) is going rapidly, and it has influence people's life. IoTs can be described as the interconnection via the internet of computing devices embedded in everyday object like smart-phones, Internet TVs, sensor and actuators that connect to the Internet. One of the IoTs that spread very fast is home and building automation systems. On the one hand, they provide increased comfort especially when employed in a private home. On the other hand, automation systems installed in commercial buildings do not only increase comfort, but also allow centralized control of heating, ventilation, air condition and lighting. Hence, they contribute to an overall cost reduction and also to energy saving which is certainly a main issue today. This automation system has become an integrated part of people's lives and the usage of this system is increasing daily. The automation systems nowadays not only can be used in buildings, people started to implement in agriculture. Greenhouse farming is one of the agriculture that mainly utilizes the automation system to control and monitor their plants.

Planting is an art and science. Approximately 95% of plants, either food crops or cash crops are grown in open field. Since time immemorial, people have learnt how to grow plants under natural environmental conditions. In some regions where temperature and climate are extremely adverse and crops cannot be grown, people has developed methods of growing some high value crop continuously by providing protection from the excessive climate, which is called as Greenhouse Farming. So, greenhouse farming is the technique of providing favorable environment condition to the plants. It is rather used to protect the plants from the adverse climatic conditions such as wind, cold, precipitation, excessive radiation, extreme temperature, insects and diseases. It is also of vital importance to create an ideal micro climate around the plants.

This is possible by erecting a greenhouse, where the environmental conditions are so modified that one can grow any plant in any place at any time by providing suitable environmental conditions with minimum labor (Arun & Sudha, 2012).

Greenhouse Control and Monitoring System is systems that connect through internet and can receive the data information from the sensors that connect to the ethernet which the data are greenhouse's temperature. The system will sent alert to user's mobile, computer or tablet and will take an initiation action such as activate the water sprinkle to cool down the environment before user present at the greenhouse. Not only the temperature can be controlled, the greenhouse environment will also be continuously monitoring and maintaining certain desired temperature. Hence, this will contribute to the users that need to control the temperature to maintain the condition of the plants and will reduce the overall cost of the user and saving energy without over consume.

1.2 Problem Statement

Nowadays, people using technology to create a path to have a more comfortable environment, internet of things is one of the paths that bring conveniences to all of us. Farmers had been trouble to plant valuable plants and crops; they cannot create the most suitable environment for specific crops at their exposure farms. By implement greenhouse farming into their farms, the environment can be created, but still the farmer need to maintain the requirements. Besides that, any problems that occur in the greenhouse while in nighttime or when there is no one inside the greenhouse, the owner could not know immediately and will have a big loss.

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