SPRINKLER ACTIVATION ACCORDING TO THE TEMPERATURE USING ARDUINO

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SPRINKLER ACTIVATION ACCORDING TO THE TEMPERATURE USING ARDUINO

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Computer Networking)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

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2017

DECLARATION

I hereby declare that this project report entitled

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is written by me and is my effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: 22/8/2017

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I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Computer Networking) With Honours.

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DECICATION

Special to my beloved parents and family

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Alhamdulillah, praise be to Allah SWT for his blessing and permission as finally I was able to finish my project within the specified duration. I would like to take this opportunity to thank to my beloved family for giving me the greatest support all the time until my whole project was completed.

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ABSTRACT

Nowadays, technology is growing rapidly which is able to easy for a person to handle the work more organized and save time. Therefore, a sprinkler system is developed to provide the high level technology with automatic sprinkler by monitoring and controlling remotely. Sprinkler is a device that sprays the water to the surrounding area which is similar to rainfall concept. This system helps in maintain the temperature of surrounding area where it is suitable for greenhouse, field and agriculture system. The an uncertain climate effects upon the changes of temperature of environment cause troublesome management and complicated in monitoring activities in real time. On this case, this sprinkler system is activated according to the temperature level by attaching a temperature sensor to the device for measuring the temperature and humidity precisely. The data detected and collected by sensor are uploaded to the database. By using this system, the user can use three operation modes to control the system. The valve will open to allow water sprays regularly through the sprinkler based on the watering time and operation modes. It also provided several notifications about the system status to the users. This system is implemented using Arduino software and hardware, applying sensor for real-time sensing for monitoring temperature and combining with a Wi-Fi module that connects the system with internet wirelessly for remote access. System also uses solar panel which captures sun power to provide renewable energy to operate the system. System is expected can fulfill all the objectives and capable to performing a high technology for users that useful in their life.

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ABSTRAK

Pada masa kini, teknologi berkembang dengan pesat yang mampu memudahkan seseorang dalam mengendalikan kerja-kerja dengan lebih teratur dan menjimatkan masa. Oleh itu, sistem pemercik dibangunkan untuk menyediakan sebuah teknologi peringkat tinggi mempunyai semburan secara automatik yang boleh dipantau dan dikawal dari jarak jauh. Pemercik adalah sejenis alatan yang menyembur air ke sekitar kawasan sama seperti konsep air hujan. Sistem ini membantu dalam mengekalkan suhu kawasan sesuai untuk sistem rumah hijau, padang dan sistem pertanian . Keadaan iklim yang tidak menentu memberi perubahan kepada suhu persekitaran menyukarkan sistem pengurusan merumitkan aktiviti pemantauan untuk sepanjang masa. Dalam kes ini, sistem pemercik ini diaktifkan berdasarkan aras suhu dengan menggunakan pengesan suhu supaya peranti dapat mengukur suhu dan kelembapan dengan terperinci. Data yang dikesan dan dikumpulkan dimuat naik ke dalam pangkalan data. Dengan menggunakan sistem ini, pengguna boleh menggunakan tiga mod operasi untuk mengawal sistem. Injap akan terbuka untuk membolehkan air disembur secara berkala melalui pemercik berdasarkan masa menyiram dan mod operation yang telah ditetapkan. Ianya juga menyediakan beberapa pemberitahuan mengenai keadaan sistem kepada pengguna. Sistem ini dilaksanakan dengan menggunakan perisian dan perkakasan Arduino dan, menggunakan pengesan untuk mengesan sepanjang masa bagi memantau suhu dan digabungkan dengan Wi-Fi yang menghubungkan sistem dengan internet untuk dicapai dari jarak jauh. Sistem juga menggunakan panel solar yang menangkap tenaga matahari bagi membekalkan tenaga untuk mengoperasikan sistem. Sistem ini dijangka dapat memenuhi semua objektif dan mampu untuk melaksanakan sebuah teknologi yang berperingkat tinggi untuk pengguna berguna dalam kehidupan mereka.

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TABLE OF CONTENTS

CHAPTER	TITLE		PAGE
	DECLARATION		ii
	DEDICATION		iii
	ACKNOWLEDGEMENTS		iv
	ABSTRACT		v
	ABSTRAK		vi
	TABLE OF CONTENTS		vii
	LIST OF TABLES		xii
	LIST OF FIGURES		xv
CHAPTER I	**INTRODUCTION**		
	1.1	Introduction	1
	1.2	Background of the project	1
	1.3	Problem Statement	3
	1.4	Project Questions	3
	1.5	Objective	4
	1.6	Project Scope	4

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

1.7 Project Contribution 4

1.8 Report Organization 5

1.9 Conclusion 6

CHAPTER II LITERATURE REVIEW

2.1 Introduction 7

2.2 Related Work/Previous Work 8

2.2.1 Mobile application 12

2.2.2 Mobile Application Development 13

2.2.3 Cross Platform System Architecture 14

2.2.4 Wi-Fi Overview 16

2.2.5 Architecture 16

2.2.6 Service Specified by Wi-Fi 20

2.3 Critical review of current problem and justification 21

2.4 Proposed Solution/further project 25

2.5 Conclusion 27

CHAPTER III METHODOLOGY

3.1 Introduction 28

3.2 Project Methodology 29

3.3 Project Schedule and Milestone 32

3.3.1 Flow Chart of project 32

3.3.2 Project Milestone 34

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.3.3 Project Gant Chart 35

3.4 Conclusion 35

CHAPTER IV ANALYSIS AND DESIGN

4.1 Introduction 36

4.2 Problem Analysis 37

4.3 Flowchart of the proposed system 37

4.4 Requirement analysis 42

4.4.1 Data Requirement 42

4.4.2 Functional Requirement 42

4.4.3 Non-functional Requirement 45

4.4.4 Others Requirement 46

4.4.4.1 Hardware requirement 46

4.4.4.2 Software requirement 50

4.5 High-Level Design 51

4.5.1 System Architecture 51

4.5.2 User Interface Design 53

4.6 Detailed Design 54

4.6.1 Software Design 55

4.7 Conclusion 57

CHAPTER V IMPLEMENTATION

5.1 Introduction 59

5.2 Software Development Environment setup 60

5.2.1 Software Installation and Configuration 60

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

5.3 Software Configuration Management 65
5.3.1 Configuration environment setup 65
5.3.2 Version Control Procedure 71
5.4 Implementation Status 73
5.5 Conclusion 74

CHAPTER VI TESTING

6.1 Introduction 75
6.2 Test Plan 76
6.2.1 Test Organization 76
6.2.2 Test Environment 77
6.2.3 Test Schedule 78
6.3 Test Strategy 78
6.3.1 Classes of tests 79
6.4 Test Design 82
6.4.1 Test Description 82
6.4.2 Test Data 85
6.5 Test Results and Analysis 87
6.6 Conclusion 90

CHAPTER VII CONCLUSION & FUTURE WORK

7.1 Introduction 91
7.2 Project summarization 91
7.3 Project Contribution 93
7.4 Project Limitation 93

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

7.5	Future Works	94
7.6	Conclusion	95
REFERENCES		96
APPENDIX A		98

LIST OF TABLES

TABLE	TITLE	PAGE
1.1	Problem Statement of Project	3
1.2	Summary of Project Question	3
1.3	Summary of Project Objective	4
2.1	Comparison of App Development	15
2.2	Comparison on Reviewed Journal	22
2.3	Comparison on Reviewed Journal	24
3.1	The Project Milestone	34
4.1	Non-functional Requirement	45
4.2	Specification of Personal Computer	47
4.3	Specification of Sensor	47
4.4	Specification of Arduino	48
4.5	Specification of ESP8266	48
4.6	Specification of Relay	49
4.7	Specification of Solenoid Valve	49
4.8	Specification of Solar Panel	50

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

4.9	Software Requirement for Sprinkler System	51
4.10	Description of Login Process	55
4.11	Description of Control Process	55
4.12	Description of Monitoring Process	56
4.13	Description of Wi-Fi process	56
4.14	Description of Sensor process	57
5.1	Software Tools	71
5.2	Version Control of Sprinkler System	71
5.3	Implementation Status of Sprinkler System	73
6.1	Test Organization Detail	76
6.2	Test Environment of Project	77
6.3	Test schedule of Sprinkler System	78
6.4	The Integration Testing of Sprinkler System	80
6.5	The Functional Testing of Sprinkler System	80
6.6	Performance Testing of Sprinkler System	81
6.7	Login Testing	82
6.8	Sensor Testing	83
6.9	Monitoring Testing	83
6.10	Controlling Testing	84
6.11	Wi-Fi Testing	84
6.12	Test Data for Login	85
6.13	Test Data for Sensor	85
6.14	Test Data for Monitoring	86
6.15	Test Data for Controlling	86
6.16	Test Data for Wi-Fi	87

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

6.17	Test Result of Login	87
6.18	Test Result of Sensor	88
6.19	Test Result of Monitoring	88
6.20	Test Result of Controlling	89
6.21	Test Result of Wi-Fi	89

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF FIGURES

FIGURE	TITLE	PAGE
2.1	System's Architecture of Home Automation Based on an Android and a Web Application Using Raspberry pi	8
2.2	System's Architecture of AWWS	10
2.3	System's Architecture of Wi-Fi Based Smart Wireless Sensor Network for Monitoring Agricultural Environment	11
2.4	Overview of Abstraction Based Cross Platform	15
2.5	An Example of the Simplest Wi-Fi Network	17
2.6	Indirectly Communication between STA1 and STA3	17
2.7	APs Communication Using the Distribution System	19
2.8	Extended Service Set	20
3.1	Prototyping Model for Sprinkler System	29
3.2	The Flowchart of Project	33
3.3	The Project Gantt Chart	35
4.1	The Flowchart of Overall System	38
4.2	The Flowchart of Sensor Module	39
4.3	The Flowchart of Wi-Fi Module	40

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

4.4	The Flowchart of Microcontroller Module	41
4.5	Structural Chart for Sprinkler System	43
4.6	Context Diagram for Sprinkler System	44
4.7	Level 0 Data Flow Diagram for Sprinkler System	44
4.8	Architecture of Sprinkler System	52
4.9	Login Interface	53
4.10	Controlling and Monitoring Interface	54
5.1	Sprinkler System Architecture	60
5.2	Hosting setup	61
5.3	Domain Setup	61
5.4	Interface of Hostinger	62
5.5	The File Manager Section	62
5.6	Arduino Installation Components	63
5.7	Arduino Software IDE Layout	63
5.8	Database Connection Configuration	64
5.9	Wiring Setup between Arduino and Esp8266	64
5.10	Flasher Tools	65
5.11	Login Interface	66
5.12	Monitoring Interface	68
5.13	Controller	70

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CHAPTER I

INTRODUCTION

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1.1 Introduction

This project is about the development of the automated sprinkler system. In this chapter, it will explain about the background of the project, problem statement, project objective, project scope and contribution of project.

1.2 Background of the project

The automated sprinkler system is built to ease the people in managing their work especially for greenhouse, field and agriculture system. Sprinkler methods can help minimize the large amount of water in agriculture system. It is enable users to control use of water more efficiency to adapt to change of climate. At the same time, sprinkler

can reduce an increasing the rate of coldness due to the lower temperature (Snyder and Melo-Abreu, 2005).

This system operates by using Arduino as microcontroller which contains some program installed to instruct system to work properly. System acts by read a sensor value in real time and store to the database. The system include solenoid valve controlled by relay to perform off or on function to release or prevent the watering through the sprinkler. So, it shall be configure to receive signal and open or close the valve.

A sensor is attached to the system that can be known as temperature sensor which functionally as detector. This sensor will sense the temperature and humidity of surrounding area. According to the threshold value that is setting for this sensor, system will allow the sprinkler to works. Means, when sensor detects the temperature level is reached or more than certain threshold of temperature, the sprinkler will automatic operates for sprays water to the surrounding area. The users also can set time schedule for watering and control the system manually.

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However, the system can provides watering time for this sprinkler system and display system notification to the user. This system comes out with a solar panel to capture solar power for supplying voltage to the battery on sunny days and a Wi-Fi module to make connection to the internet.

So, these systems make it easier for people who want to maintain the humidity and temperature of surrounding area and capability to provide remote monitoring control the system .System also can save manpower, water usage and lower utility.

1.3 Problem Statement

Table 1.1 below shows several problem statements in this project.

Table 1.1 Problem Statement of Project

PS	Problem Statement
PS1	Current technology performs manual actions that user faces the difficulties to handle the works
PS2	Difficult to monitor temperature and also control sprinkler to supply water resources.
PS3	Waste of time, energy and operational cost to maintain the humidity of surrounding area and also use excessive water and uncontrolled.

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1.4 Project Questions

Table 1.2 below shows several questions in this project.

Table 1.2 Summary of Project Question

PQ	Project Question
PQ1	What are current technology uses for watering system?
PQ2	What type of technique can be used to improve sprinkler system?
PQ3	How can the efficiency of the sprinkler system be achieved?

1.5 Objective

Table 1.3 below shows several objectives to build this project.

Table 1.3 Summary of Project Objective

P0	Project Objective
PO1	To study the developments of the current sprinkler system technology.
PO2	To propose new technology that can improve the current sprinkler system.
PO3	To evaluate the efficiency of sprinkler system technology.

1.6 Project Scope

i. A system provides real time monitoring and controlling the system remotely.
ii. A system operates based on operation modes control by the users.
iii. Data transmit to the database through Wi-Fi module.
iv. Recharge the battery using solar panel in sunny days.
v. Provide notification about the system status.

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1.7 Project Contribution

This system will capable to provide remote monitoring and control the system .System can save manpower, water usage and lower utility and also maintain temperature and humidity of surrounding area effectively.

1.8 Report Organization

This part is contains summary of the all major chapters involved during the process of project development. The report is divided into seven chapters and simply describes on each chapter outline.

Chapter I: Introduction

In this chapter will briefly introduce about the project to be developed. This chapter contains background of project, objectives, problem statement, project scope and project contribution related to the sprinkler system.

Chapter II: Literature Reviews

This chapter indicates about the research and study of related the other previous project to provide more understanding about the propose system and including the conclusion of chapter to complete this chapter.

Chapter III: Methodology

This chapter shows about type and flow of methodology that will be choose for development of the system that would be carried out to develop a new project. This chapter will ease for organizing the project. The conclusion of this chapter will be included to complete this chapter.

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Chapter IV: System Analysis & Design

This chapter gives a simply descriptions about result of analysis of the initial design and result of the detailed design. This chapter contains problem analysis, requirement analysis, high level design and detailed design of sprinkler system.

Chapter V: System Implementation

This chapter covers the all activities and processes in the implementation and system development. This chapter involves implement and converting of design into the programming language and logic process.

Chapter VI: System Testing

This chapter discusses about process of testing and evaluation of sprinkler system after implementation process is done in order to identify the expected result of proposed system in each modules.

Chapter VII: Conclusion

This chapter shows about the summarization of the whole project. Besides the limitation that exist in this project and several future additional recommendation will be carry out in this chapter. Then, it follows with conclusion overall of this project.

1.9 Conclusion

This chapter gives an overall background of development of the sprinkler system. Basically, it is covers about the introduction of project that will be developed, objective of the project, problem statement and scope of the proposed system. The project that needs to be carrying out in this study is to improve sprinkler water system. This project can be a new technology that can give benefit to the user to easy their work. Then, the next chapter is continues by literature review which contains several previous research related to the project.

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