UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DRAIN BLOCKAGE MONITORING USING ANDROID APPS

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer Systems) with Honours.

by

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I hereby, declared this report entitled DRAIN BLOCKAGE MONITORING USING ANDROID APPS is the results of my own research except as cited in references.

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Date: 2 DECEMBER 2018

APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Computer Engineering Technology (Computer Systems) with Honours. The member of the supervisory is as follow:

Signature: …….

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ABSTRAK

Penyumbatan longkang merupakan kebimbangan utama dalam kehidupan seharian kita. Ia disebabkan oleh sesetengah warganegara yang tidak peduli terhadap saliran di kawasan mereka. Malah, masalah sistem longkang juga menjadi sebab kerana ia tidak diurus dengan cekap, saiz pembetungan kecil juga mengganggu saliran. Di samping itu, masalah yang sering terjadi adalah bahawa sesetengah orang yang membuang sampah ke saliran dan anak sungai juga dikenal pasti sebagai penyumbang kepada masalah saliran atau banjir. Di samping itu, banjir biasanya berlaku di kawasan tanah rendah. Oleh itu, air hujan akan mengalir ke sungai dan akan melimpah sehingga kawasan tanah rendah dipenuhi dengan air. Ia boleh menyebabkan longkang menjadi cetek dan tersumbat. Oleh itu, malapetaka ini boleh menyebabkan kerosakan alam sekitar, harta benda dan menyebabkan kehilangan nyawa. Sistem ini direka untuk menentukan tahap atau tahap limpahan saliran. Seterusnya, untuk mengawal penyumbatan saliran dengan menghantar maklumat amaran dengan menggunakan aplikasi Android kepada pengguna untuk tindakan segera. Malah, projek ini menawarkan cara yang mudah dan mesra pengguna. Oleh itu, dari sistem ini sensor ultrasonik akan mengesan objek atau sampah dan jarak objek di dalam air untuk menentukan paras air yang akan berlaku. Apabila paras air berlaku dari simpanan sampah, sensor ultrasonik juga akan mengesan takungan. Dari sensor yang digunakan dalam projek ini, ia akan disambungkan ke Arduino Uno untuk menghantar data melalui aplikasi Android. Oleh itu, jika takungan yang dikesan oleh

sensor ultrasonik, pengguna akan menerima amaran menerusi aplikasi Android dan ia akan mengurangkan masalah yang dihadapi oleh masyarakat.

ABSTRACT

Drain blockage is a major concern in our daily lives. It is caused by some citizen who do not care about drainage in their area. In fact, the problem of the drain system is also a cause because it is not efficiently managed, the size of the small sewerage also disrupts the drainage. In addition, the often common problem is that some people who dump trash to drainage and creeks are also identified as contributors to drainage or flood problems. In addition, floods usually occur in lowland areas. Therefore, rainwater will flow to the river and it will overflow until the lowland area is filled with water. It can cause drains to become shallow and clogged. Therefore, this catastrophe can cause environmental damage, property and cause loss of life. The system is designed to determine the degree or level of drainage overflow. Next, to control the drainage clogging by sending warning information by using the Android app to the user for immediate action. In fact, this project offers a simple and user-friendly way. So, from this system the ultrasonic sensors will detect the object or the waste and distance of the object in the water to determine the water level that will take place. When water levels occur from junk storage, sensors ultrasonic will also detect the reservoir. From the sensors used in this project, it will be connected to Arduino Uno to transmit data through Android apps. Therefore, if the reservoir detected by ultrasonic, users will receive a warning through the Android app and it will reduce the problems faced by the community.

DEDICATION

To my beloved parents; Rasdi Bin Mohd Jaafar and Ruhani Binti Jusoh, and for my beloved family who encourages me, also do not forget to whom may involve in order helping me to complete my project. I also dedicate this report to my supervisor who always encourage and guide me until the completion of the project. Finally, this dedication is also dedicated to my beloved friends that have provided me with a strong love shield and always surround me and never lets any sadness enter inside.

Thank you.

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I take this opportunity to express my greatest gratitude to the people who have helped and supported me throughout especially to my supervisor, Pn. Rosziana Binti Hashim and co-supervisor; Pn. Norfadzlia Binti Mohd Yusof. Without their encouragement and guidance, this project would not have existence.

Last but not least, a special thanks to my family members for giving me support, help, views and tips which were useful. Finally, to everyone who has directly or indirectly contributed to this project, only Almighty Allah S.W.T can repay your kindness and may Allah S.W.T bless you all. Amin.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

ft’	-	Feet

LIST OF ABBREVIATIONS

GSM	Global System for Mobile Communication
WSN	Wireless Sensor Network
SMS	Short Message Service
GPS	Global Positioning System
SPC	Statistical Process Control
IP	Internet Protocol
IOT	Internet of Things
DMS	Disaster Management Server
LCD	Liquid Crystal Display
CSV	Comma Separated Values file
LED	Light Emitting Diode
IDE	Integrated Development Environment
ICs	Integrated Circuit
PCB	Printed Circuit Board
GPIO	General-Purpose Input / Output
DC	Direct Current
AC	Alternating Current
PC	Personal Computer
USB	Universal Serial Bus
ICSP	In Circuit Serial Programming
PWM	Pulse Width Modulation

CHAPTER 1

INTRODUCTION

1.0 Introduction

The overview of the study and the main purpose of this study will described in this section. In fact, the project background, problem statement, objectives and scope of the project will be explained in this chapter. Understand in general description projects can be improved through this section.

1.1 Background

According to (Rosser, Leibovici and Jackson, 2017), floods are a massive damage to the people, infrastructure and economy in many countries of the world. The rapid estimates of floating areas are important to manage the operation of the reaction effectively during flood events. To prioritize relief efforts and planning for preventive measures, timely and accurate information on areas affected by flood water is urgently needed by emergency managers.

Flood victims can increase in every area affected if lack of information about the upcoming floods (type, location, severity). Therefore, accurate and detailed reminders and short-term predictions are important to detect this disaster happen (Mousa, Zhang and Claudel, 2016).

In addition, the basic part of urban management is sewer management and drains. In fact it works to prevent dirty water and rain water. To ensure proper flow of water is to automate blockage detection and temporary waste transfer process. In fact, it can reduce workload. Serious problems for urban dwellers are drainage on roads and residential areas. For example, with the 4.5m flood that took place in the city of Dhaka (Talukder *et al.*, 2017).

In addition, there is no insufficient resources and manpower to check drainage and remove obstacles from the dumped point. Inadequate source support from corporations is impossible to manage manual drainage systems. Therefore, city obstruction can be automatically removed by building an automated microcontroller system to manage the urban drainage system (Talukder *et al.*, 2017).

Based on (Atijosan *et al.*, 2017), the majority of residents living in high-risk flood zones does not have a flood or flood warning system. Therefore, to continue to promote the development of flood monitoring in real-time or early warning systems for developing countries is the availability of cheap and affordable technology Community-based remoteness for real-time flood or early warning systems is to mitigate the adverse effects of the flood on the lives and lives of the poor and the weakest in society, especially in developing countries.

1.2 Problem Statement

The illusion of project development comes when the rain continues endlessly causing floods to occur. In fact, about problems with drainage systems because it are not

efficiently managed, small sewerage sizes also disrupt drainage. However, weather such as the monsoon season in Malaysia are inevitable. Besides that, flood usually occur in the lowlands. Therefore, rainwater will flow to the river. The water-filled river will overflow until the lowland area is filled with water. In fact, the habit of a few society who dumping litter into the drainage and tributaries also are identified as contributing to the problem of drains or floods. It can cause drains to be shallow and clogged.

Hence, this catastrophe can cause environmental damage, property and it cause loss of life. Additionally, a handful of society do not monitor to protect that the drainage system is always in perfect condition free of any obstacles. Because of this, it will disturb many parties because the drainage can contribute to the water pollution, public health problems, flash floods, mosquito breeding, and venomous animals.

So, this system to determine the level or level of drainage from overflowing. Next, it will send warning information to the consumer for immediate action. Then, users will deal with systems via WiFi even from different areas.

Therefore, this project aims to full fill the following objectives:

1.3 Objectives

The following are the objective of this project:

i) To measure level water of drainage by using Arduino.

ii) To control the drain blockage by using Arduino.

iii) To develop a prototype of drain blockage monitoring using Android.

1.4 Scope

The scope of this project is to build a prototype to measure the water level at the drain and control drainage from clogging. Throughout this project, the major thing to be used is the Arduino microcontroller, sensor ultrasonic, and Android that send alerts to users for immediate action.

There are several scopes considered in this project that can be divided into three major process element. These elements can obtain an understanding of the whole project considering the final goal of building a project. The components are:

i) Design.

ii) Simulation.

iii) Testing.

Eventually, the errand will be proceeding on composing the project report.