UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF GARBAGE MONITORING SYSTEM USING BLYNK

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

by

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ABSTRAK

Report ini adalah untuk pembangunan sistem pemantauan sampah menggunakan Blynk yang membolehkan pengguna memantau jumlah dan berat tong sampah mereka. Tindakan tertentu perlu diambil untuk menjaga kebersihan mengelilingi kita. Projek ini adalah untuk membina sistem pemantauan sampah yang berkaitan dengan platform IoT, Blynk. Dalam sistem ini, sensor ultrasonik akan dipasang di atas tong untuk membaca tahap sampah. Semasa di bawah sel beban bin akan dilampirkan dengan sensor sel beban hx711 untuk membaca berat tong. Tahap sampah akan dimaklumkan dalam aplikasi android. Pengguna dapat melihat data masa nyata mengenai tahap dan berat sampah dalam tong. Modul Wi-Fi Esp8266 terintegrasi untuk dapat menghantar data melalui Wi-Fi sejak teknologi internet telah ditingkatkan di Malaysia. Semua sistem masuk disepadukan dengan Wi-Fi sekarang untuk menjadikan kehidupan lebih mudah. Ini membantu pengguna untuk memantau sistem tidak kira di mana dan bila-bila masa. Arduino uno digunakan sebagai mikrokontroler dalam sistem ini untuk mengawal sistem. Apabila tahap sampah mencapai maksimum, pekerja korporat boleh mengambil tindakan selanjutnya untuk mengosongkan tong sampah. Sebagai kesimpulan, sistem pemantauan sampah ini akan dapat memastikan bandar bersih dan bebas daripada tercemar di samping penggunaan teknologi IoT.

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ABSTRACT

This report proposes the development of garbage monitoring system using Blynk that enables users to monitor the amount and weight of their garbage bin. Certain actions should be taken to take care and improve the cleanliness surround us. This project is to build garbage monitoring system which associated with IoT platform, Blynk. In this system, an ultrasonic sensor will be attached on top of the bin to read the level of garbage. While on the bottom of the bin load cell will be attach with hx711 load cell sensor to read the weight of the bin. The level of rubbish will be notified in the android app. User will be notified real time data on level and weight of rubbish in the bin. Esp8266 Wi-Fi module is integrated to able send data via Wi-Fi since the technology of internet been upgraded in Malaysia. All incoming system is integrated with Wi-Fi now days to make life easier. This helps user to monitor the system no matter where and at any time. Arduino uno is used as microcontroller in this system in order to control the system. When the level of the rubbish reach maximum , the corporation's employee can take a further action to empty the bin. As a conclusion, this garbage monitoring system will able to keep the city clean and free from polluted in addition to the use of IoT technology.

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DEDICATION

I would like to dedicate my thesis to my beloved parents, siblings and friends

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I would like to express my gratitude and appreciation to the God for giving His bless upon completing my final year project throughout the hardship I have endured and giving me endless strength to face the project.

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Thinesh a/l Ravenda

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LIST ABBREVIATIONS, SYMBOLS AND NOMENCLATURES

IR sensor	-	Infrared sensor
EEPROM	-	Electrically erasable programmable read-only memory
IDE	-	Integrated Development Environment
LED	-	Light emitting diode
OS	-	Operating System
USB	-	Universal serial bas
GUI	-	Graphical user interface -
GPS	-	Global Positioning System
GSM	-	Global System for Mobile
IoT	-	Internet of Things
RFID	-	Radio-Frequency Identification
DC	-	Direct current
AC	-	Alternate current
RF		Radio frequency
LAN		Local Area Network
LCD		Liquid crystal display

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CHAPTER 1

INTRODUCTION

1.0 Project Background

These days with the quick development in the human population and financial advancement, solid waste has turned out to be one of the serious natural issues in Malaysia. This issue had occurred because of poor dealing with procedure of waste gathering and administration in the nation. The waste made from different sources will be prompt natural contamination emerging without a sustainable and efficient strong waste administration. Moreover, this bin likewise bring into wellbeing threats that empower the sickness vector rearing bug, flesh creatures and rodents, and end in spreading disease. Extra waste item as often as possible made among expanding of population development, so to keep up of waste is by and by overseen waste should to be diminished on a private premise.

Over that, this attempt will plot more gainful and methodical structure for the waste organization association. This attempt is to create IoT garbage monitoring system which is waste constant monitoring system that will impact used of remote sensor to network and correspondence advances to give a response for unreliable waste organization structure. In this project power supply is utilized for working the microcontroller, sensors and Wi-Fi module. By that, the structure will utilize sensor that will recognize level and weight in the waste container, and direct flash real time data into Blynk. The information in Blynk will associated with monitoring system and will be appear on versatile application. This monitoring structure immediate to command by the waste organization specialists with the objective which that bin screen and monitor the present waste information. Consistent monitoring system's projects will empower the specialists to obtain information from the dustbin in current to state.

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1.1 Problem Statement

The world today is moving rapidly nearby the quick stream of advancement. A long with it, people need to move rapidly so it not leaves behind an extraordinary open door by development that obtainable nowadays.

In where various human populaces it will a more prominent measure of trash bin which bin readied, it help user to get rid of waste easily. However, when the waste is overflow the organization doesn't cleans up the bin. This is due to the cleaner not able to recognize the heading or details on the overflow waste inside the dustbin. For monitoring the trash bin in spite of all that it use the way it was done in past times worth remembering and it isn't incredibly profitable for this age, so influenced this project to bin make the work clean speedier and less requesting.

Other issue that bin see is that truck collector does not know whether the sum weight of the trash they bin gather which bin be gathered after complete the process of gathering in sure before continue to various area. In this advancement of garbage monitoring system, weigh scaling sensors were added. The fortunate thing about this measure observing is that the waste dustbin lifting weight bin even be known by the waste administration affiliation. On the off chance that the waste container isn't packed, yet at the same time the heaviness of fill has achieved the farthest point of what the dump truck bin get, the vehicles bin be promptly bring towards that depot for clearing.

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1.2 Objective

The reason for implement this project is to give details which bin screen the dustbin utilizing with the upgraded innovation.

1. To develop a model of garbage monitoring system that integrated with IoT platform, Blynk.
2. To study the operation of garbage monitoring system by computing the height and weight of garbage inside the bin.
3. To integrate the information received from the garbage monitoring system via IoT platform, Blynk.
4. To test and use the monitoring system by using Wi-Fi module.

1.3 Scopes of Work

This project is to make garbage monitoring system with consistent monitoring system that inspects the present details of dustbin from portable mobile application. This project is isolated by two noteworthy divisions that are for the underlying portion is transmitter and another part is for recipient. The transmitter includes hx711 sensor and Arduino Uno as microcontroller which realized at the waste dustbin. In while the gatherer part contain control units which are Blynk versatile applications that will have the ability to analyze information from sensor and transmits the information into database and command by monitoring system. Figure 1.3 underneath demonstrates stage of observing system.

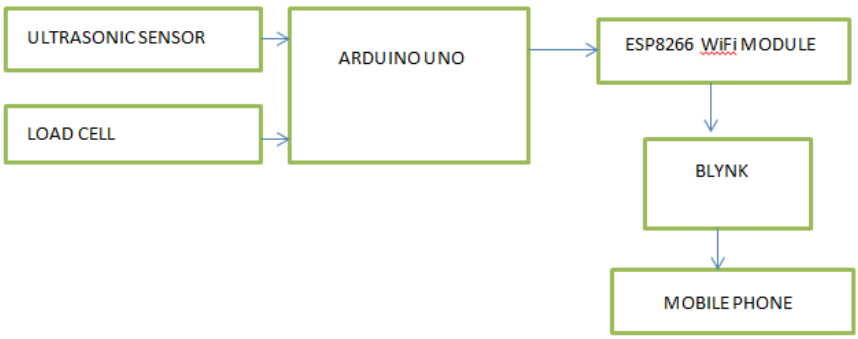

Figure 1.3 shows the architecture of the garbage monitoring system

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Hx711 load cell sensor being used in the project to observe information that will be gained. These sensors utilize to determine the quantity of waste in dustbin while hx711 sensor will be used to quantify heaviness of waste in the junk container. The both ultrasonic sensor and load cell sensors will interface with the Arduino microcontroller and after that esp8266 module will let the Arduino and versatile applications relationship in it. Esp8266 module is used to extract data from sensor and screens direct into Blynk with versatile applications affiliation. Other than that, the weight will be estimated and weight additionally screened in the versatile applications.

1.4 Project Significance

The want of this project is to deal with issue waste not gather and make the straightforwardness for monitoring the dustbin. It like way transforms into the simple to utilize trash bin which bin be used by all people. Waste collector able to pick up garbage when there is a notification that trash bin is full which is save time for them to influence them by not inspect the level by monitoring the waste by reaching that area to know the level of waste. Meanwhile it helps the gatherer to save time, to fuel and not focus to accumulate the junk in reliably. Exactly when the waste are accumulated in to a great degree splendid and speedier so it bin avoid the spread microorganisms. Weight monitoring likewise causes truck drivers to know they achieved the highest of gathering trash and continue to the place to dump away the garbage gathered. This project bin moreover ensure full garbage bin be collected as fast as time grants without empowering it to overflow. In the occasion that deny not collected impacts our viewpoints which also will effectuation fragrance smearing. This project helps to handle issue which looked by the organization of gathering waste. Furthermore, this project has new application or structure that is esp8266 module used for overall system observing. This project able to helps many people for having easier life without need to put a lot of effort.

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1.5 Project Methodology

Project methodology which is a critical division demonstrates progression of task to be finished. The purposes will be accomplished to acquire a favorable outcome in the task. Task began by having discussion with the project supervisor, at that point contemplate the project have been outlined by other organization or individual. For the accompanying stage, all the data identified with equipment and programming segments data is looking for and the most reasonable would be chosen for utilized as a part of this project. On the off chance that the yield of the system did not satisfy the wanted yield, so the investigating would be complete until the point that it achieves the project preconditions.

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CHAPTER 2

LITERATURE REVIEW

This section emphasis on the previous research made on the project which is quiet similar to the project will be made. Moreover, information or methods deploy from the past research that are inspected. As relate by the project, about garbage monitoring system with IoT, are identified with this detachment. Many past explores outlined the observing system.

2.0 Needs for Garbage monitoring system

Hygiene is an important factor for a proper environment. Increasing population has resulted in increasing demand for things as well as increasing levels of pollution. This kind of consequently, results in increasing garbage and decreasing hygiene. Garbage issues need to be considered seriously for maintaining the cleanliness of the| cities. Many city areas still do not have public garbage bins and so the garbage is thrown on the side of the road or at some spot in the locality. Trash is also thrown in small water reservoirs or drainage water, which creates blockages. During the drizzling season, these blockages bring about water overflowing onto the streets. In some areas, this overflowing water blocks all transport or causes small floods within the city.

Open garbage containers cause problems for the people surviving in that neighborhood as it becomes a mating ground for germs and insects like mosquitoes, which spread numerous diseases. In many areas, the rubbish bins are not cleaned out and maintained regularly. These types of open garbage areas create unhygienic conditions in those areas.

To overcome these hygiene problems, smart waste materials management & monitoring systems should be adopted. Intended for adoption of such smart

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systems, there should be a paradigm shift towards the Internet of things (IoT). Wise systems will help in optimizing the rubbish management system and also in reducing the consumption of fuel by the current system.

2.1 Information for the Waste Management Association

Waste management association bin help local authority in directing for the subsequent garbage collection timetable. The waste bin is regularly monitored, analyzed, and rescheduled timetable of garbage collection according to the distance of waste in the trash bin. Area with high regularity of collection of garbage bin be rescheduled often to avoid environment pollution. With the sensor, it helps determine distance of junk in the waste bin. This bin help to reduce the progress time to collect the waste process. Truck collector does not need to need to go the office to monitor the waste through computer. They bin check through their mobile apps designed to monitor the garbage level which indirectly save time and cost. New feature added in this garbage monitoring is weigh sensing which help management to monitor or analyses amount of garbage being collected daily, weekly, monthly or yearly. The good thing about this weigh scaling is that the trash weight collected bin even be acknowledged by the waste management association. Even though garbage in rubbish bin is not chock-full and still the load in the bin has reached the bound of waste truck bin collect, the truck will immediately brought for the clearance of waste in the truck.

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