

Modern Garbage Bin Proctor using GSM

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Abstract— There are many technologies which are used for waste collection as well as for well managed recycling. In this project, we have introduced an integrated system combined with an integrated system of Global System for Mobile Communication (GSM).The sensors would be placed in the common garbage bins placed on the public places. When the garbage reaches the level of the sensor, then that indication will be given to ARM 7 Controller. The controller will give indication to the driver of garbage collection truck as to which garbage bin is completely filled and needs urgent attention. ARM 7 will give indication by sending SMS using GSM technology.

Index Terms— GSM, ARM7 Microcontroller, LCD (Liquid Crystal Display).

I. INTRODUCTION

In Day to Day life, we see the pictures of garbage bins being overfull and all the garbage spills out resulting in pollution. This also increases number of diseases as large number of insects and mosquitoes breed on it. Hence our problem statement is to design a System Based on Arm 7 for collecting the garbage from a particular area – the area whose public Garbage Bins are overflowing with prior concern.

Though the world is in a stage of up gradation, there is yet another problem [1] that has to be dealt with. Garbage! Pictures of garbage bins being overfull and the garbage being spilled out from the bins can be seen all around. This leads to various diseases as large number of insects and mosquitoes breed on it. A big challenge in the urban cities is solid waste management. Hence, smart dustbin is a system which can eradicate this problem or at least reduce it to the minimum level. Our present Prime Minister of India, Sri Narendra Modiji has introduced the concept of implementing 100 smart cities in India. “Swachh Bharat Abhiyan” was initiated to ensure a clean environment. Majority of viruses and bacterial infections develop in polluted environment. Safeguarding the environment using technology sources is needed at present. Majority of the public environment seems to be polluted with the waste material. So, modernization of the restaurants is needed by imparting the smart technology [2]. Amounts of waste are largely determined by two factors: first, the population in any given area, and second, its consumption patterns. According to the UN, between now and 2025, the world population will increase by 20% to reach 8 billion inhabitants (from 6.5 today).With this increase in population, the responsibilities towards waste management also increases. Our waste administration frameworks and our economic situations, even taking care of business, are unequipped for taking care of the developing measures of waste universally. So unless a new paradigm of global cooperation and governance is adopted, a tidal wave of uncontrolled dumpsites will be the principal waste management method, especially in Asia. On the west coast of America, San Francisco leads

the way with a landfill disposal diversion rate of 72% and the city has set itself a target of zero waste to landfill by 2020. This paper gives us one of the most efficient ways to keep our environment clean and green. Dustbin is a common means and a basic need everywhere. It is observed that often the garbage get collected due to irregular removal of garbage present in the dustbin. In the proposed paper, a new model for the municipal dustbins which intimates the center of municipality for immediate cleaning of dustbin has been proposed [3].

II. LITERATURE SURVEY

The authors in [3] have made a quantitative analysis between existing dustbins and their serving population. The study first analyses the spatial distribution of dustbins in some areas of Dhaka city using average nearest neighbor functions of GIS. Remarkably, the spatial circulation of the current dustbins has appeared to be dominantly in clustered pattern. Next, an optimal number of additional dustbins were calculated. It is shown that the number of existing dustbins is insufficient in the study area. The extent of pollution caused by the existing dustbins was calculated using spatial analyst functions of GIS. It is found that all the dustbins are burnt with wastes and causing pollution to the environment. The results thus obtained would help to understand the present situation of the waste management of Research Article Volume 6 Issue No. 6 International Journal of Engineering Science and Computing, June 2016 7114 <http://ijesc.org/> Dhaka city and to optimally place the required number of dustbins to prevent further pollution to environment.

III. PROPOSED METHOD

Solid waste management is a big challenge in urban areas for most of the countries throughout the world. An efficient waste management for maintain a safe and green environment as there are increasing all kinds of waste disposal. There are many technologies are used for waste collection as well as for well managed recycling. In this

project, we have introduced an integrated system combined with an integrated system of Global System for Mobile Communication (GSM). The sensors would be placed in the common garbage bins placed on the public places. When the garbage reaches the level of the sensor, then that indication will be given to ARM 7 Controller. The controller will give indication to the driver of garbage truck collection as to which garbage bin is completely filled and needs urgent attention. ARM 7 will give indication by sending SMS using GSM technology

IV. PROPOSED COMPONENTS USED IN GARBAGE BIN MONITORING

ARM7 LPC2148 Micro controller

The ARM LPC2148 is a 32-bit microcontroller with real-time emulation and embedded trace support, that combines it with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2148 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems. It also includes an in-built Real Time Clock (RTC) which plays the key role in our present application.

➤ Liquid Crystal Display(LCD):

The 2 line, 16 characters LCD screen is used to display the instruction information, that to collect garbage from garbage bins, if the garbage bin is filled

Working

The input to the sensor module would come from the waste bin which are placed at different localities in the public area. The sensor is placed in the garbage bin at a max level, if that level is crossed by the garbage in the bin, then sensor will sense that and will communicate to ARM 7 controller through GSM technology.

When the garbage box 1 becomes full, the ultrasonic sensor attached to its lid will detect the level and send a command through GSM. The GSM receiver will receive that command and show the condition of garbage box on Liquid Crystal Display and on the

computer. The Message would be that the garbage bin 1 in particular area is filled completely, please collect it”.

At the same time a message will be sent to a driver's mobile that particular garbage bin is completely full through Short Message Service. Same thing will happen when the garbage box 2 becomes full; the ultrasonic sensor will detect the level and send a command through GSM that garbage bin 2 in another area is filled completely, please collect it. At the same time same message will be sent to a driver's mobile to collect the garbage bins through Short Message Service. By Instance even if both the garbage bin are full at the same time, then also both messages will be displayed on Liquid Crystal Display and. Also Short Message Service will be sent to driver's mobile one by one.

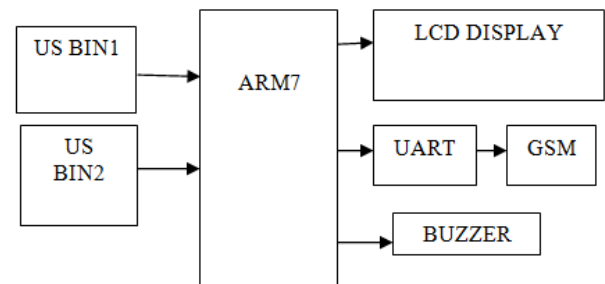


Fig1: Block diagram

V.SIMULATION RESULTS

A compiler for a high level language helps to reduce production time. To program the LPC2148 microcontroller the Keilµv4 is used. The programming is done in the embedded C language or Assembly language. Keilµv4 is a suite of executable, open source software development tools for the microcontrollers hosted on the Windows platform.

One of the difficulties of programming microcontrollers is the limited amount of resources the programmer has to deal with. In personal computers resources such as RAM and processing speed are basically limitless when compared to microcontrollers. In contrast, the code on microcontrollers should be as low on resources as possible.

Keil Compiler

Keil compiler is software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code. The compilation of the C program converts it into machine language file (.hex). This is the only language the microcontroller will understand, because it contains the original program code converted into a hexadecimal format. During this step there are some warnings about eventual errors in the program. If there are no errors and warnings then run the program, the system performs all the required tasks and behaves as expected

the software developed. If not, the whole procedure will have to be repeated again.

Flash magic

Flash Magic is a PC tool for programming flash based microcontrollers from NXP using a serial or Ethernet protocol while in the target hardware. The baud rate is selected for the microcontroller and the registers erased before the device is programmed. If dumping process of the hex file is completed, then the controller will work as per our requirement.



The objective of simulator is to perform modelling and simulation of SDN network using OPNET simulation, the following approach has been adapted: Create Topology, Model various source and sink equipments, Link Bandwidth, Create Traffic. The network diagram of SDN, ACCS and CMS network which are created by the simulator are shown in figure 4,5 and 6 respectively.

Voice application is created to initiate multicast voice call and holds for 1 minute duration and call repeats for every 2 minutes duration. The voice traffic sent is same with or without background traffic, therefore there is no voice traffic dropped with background traffic loaded as shown in the above Figure 7. The multicast voice traffic received on both the IP nodes are same with or without background traffic, therefore there is no voice traffic dropped with background traffic loaded as shown in the Figure 8 and 9. All multicast calls are successfully received by the IP node. Figure 10 shows that there exists a negligible jitter.

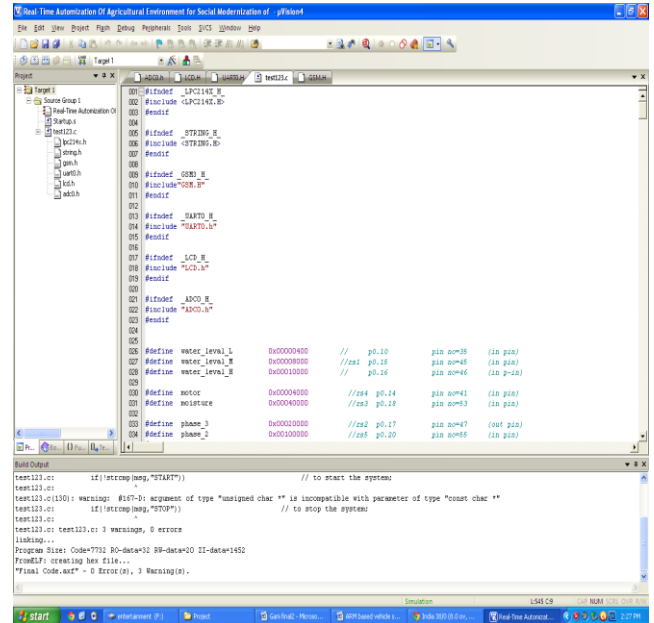


Fig: compilation of source code

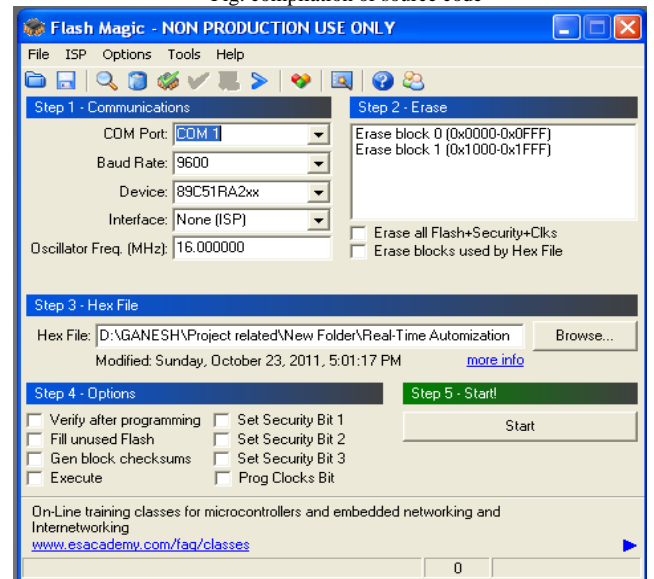


Fig: Dumping of code in microcontroller

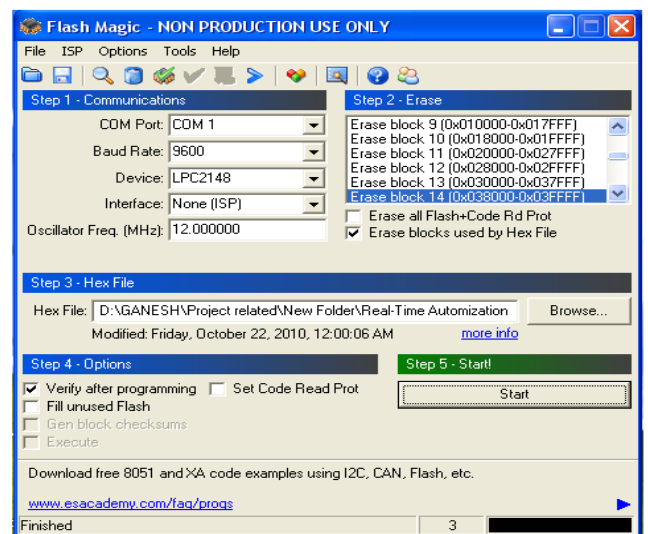


Fig: dumping process finished

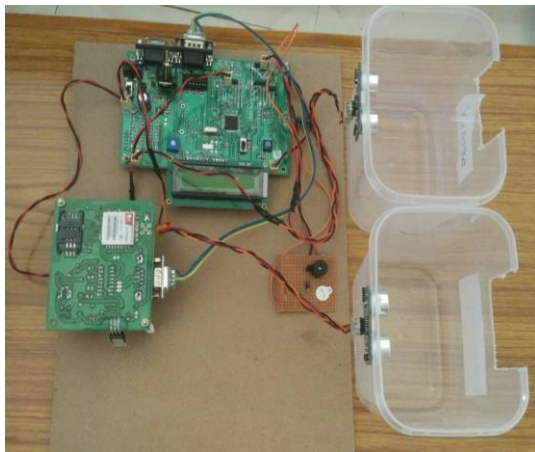


Fig : garbage bin monitoring system

VI CONCLUSION

Municipal solid waste management (MSWM) is one of the major environmental problems of Indian cities. Improper management of municipal solid waste (MSW) causes hazards to inhabitants. Various studies reveal that about 90% of MSW is disposed of unscientifically in open dumps and landfills, creating problems to public health and the environment.

In the present study, an attempt has been made to provide a comprehensive review of the characteristics, generation, collection and transportation, disposal and treatment technologies of MSW practiced in India. This project solid waste monitoring and management system has been successfully implemented with the integration of communication technologies such as, GSM and for truck monitoring system. In this system, truck database has been developed in the way that information of truck ID, driver ID, date and time of waste collection, etc. are compiled and stored for monitoring and management activities.

The proposed system would be able to monitor the solid waste collection process and management the overall collection process. It would provide in time solid waste collection and also overcome the disadvantages such as usage of minimum route, low fuel cost, clean environment and available vehicle. The technologies which are used in the proposed system are good enough to ensure the practical and perfect for solid waste collection process monitoring and management for green environment

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