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IOT Based Monitoring and Smart Planning of Urban Solid Waste Management

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Abstract

As the population is increasing, the concept of cleanliness and waste management is rapidly degrading day by day. The garbage overflows in areas such as schools, parks, roads ets. A unhygienic condition is crated in the nearby locality. it also provokes the nearby people to be affected from serious diseases. The area valuation also will be degraded. to enhance cleaning and avoid the above said effects, Smart waste management system is proposed in this project in the proposed system level of waste is detected with the help of sensor odour of the garbage is detected metal waste is detected wet and dry waste are detected and communicated to the authorized control rooms through GSM/GPRS system. GSM/GPRS system is interfaced with micro controller. Therefore waste at different locations is monitored by developing an android application. This will help to manage (segregate) the garbage collection efficiently.

Introduction

All over the nation disposal of garbage has been a great problem as population prospered and grew the quantity of garbage generated also increased initially garbage was dumped below ground in rural areas, this is the economical way of waste disposal, moreover, ground water resources ware getting contaminated continuously.

Keeping in mind safety of public health and scarcity of land for disposal, this method of land filling become expensive also, safety problems with landfills and increased awareness of public health, finding appropriate land by government was also very difficult. thus waste disposal and management become a big threat to all counties all over the globe. this tasks not only requires co-operation of government but also requires participation of all co-operation all over the world. apart from the land filling method many comprehensive methods are employee which are acceptable by both environment and people. **I.**

Garbage discharges form household and business are collected and transported through trunks and are made to store in a garbage disposal plant here the garbage is stored in a pit and the pit door automatically opens when an authorized person is in front of the pit. in case the pit is full the level sensor senses the full condition if there is any bad odour from the pit then there is also an odour sensor to sense the odour further segregation process also takes place the dumped garbage is made to flow through an compartment placed with metal detector which detects the metal waste and send it to a metal waste container further the remmaing waste is checked for conductivity and if the waste is conduction it is said to be as wet waste else dry waste, the wet waste is stored in the wet waste container, for dry waste also conductivity can be checked and likewise all waste are segregated accordingly and based on IOT the system is operating therefore the waste management can be done and hygine can be maintained.

After the segregation process west waste is buried under the ground and dry waste is re-cycled and reused likewise waste can be effectively managed. the system introduced in this paper has been developed for effective management of waste.

Literature Survey

Many Smart cities and many organisations all over the world have already been implementing many applications regarding waste management. Typical examples are smart agriculture, smart parking, smart transport. All these are step towards a smart city..

Literature Survey on GSM

The abbreviations for GSM stands for global system for mobile communication. It is used for transmitting mobile voice and data services based on digital cellular technology. The concept of GSM emerged from a cell-based mobile radio systems at Bell laboratories in early 1970's. To create a common eruopeon mobile telephone standard a standardization group was established in 1982 by the name IT. The most commonly accepted system in telecommunication is the GSM. GSM is circuit switched system that divides 200 khz channel into light 25 khz time slots.

In most parts of the world GSM operates on the mobile communication Bands of (900 to 1800) MHZ in US, GSM operates in the range of (850 to 1900) MHZ. The 70% of the world's digital cellular subscribers market share is owned by GSM (TDMA) Time Division Multiple Access narrow band technique is also used by GSM. It has ability to carry 64 kbps to 120 mbps of data rate. More than one billion mobile subscribers in more than 210 countries throught the globe are supported by GSM. GSM also provides roaming services.

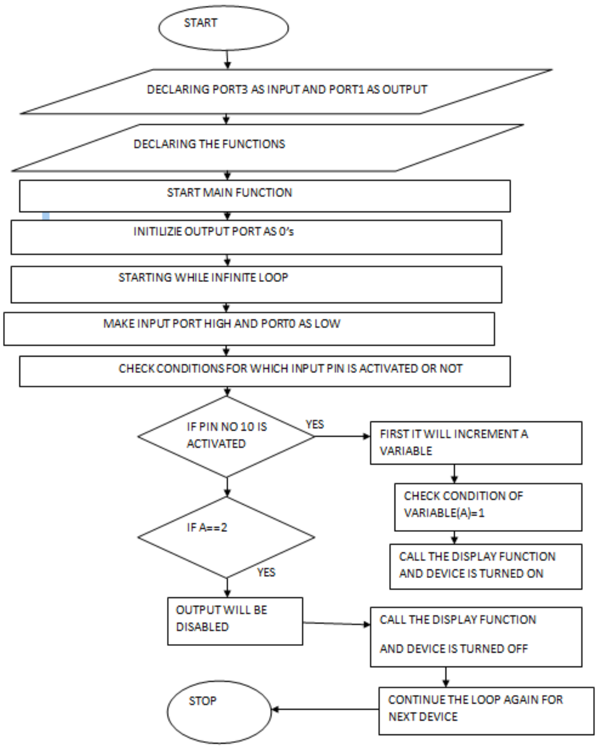
Literature Survey On Internet Of Things (Iot)

In 1982 the concept of smart cities were introduced, the first internet connected appliance was the coke machine at carnegie mellon university, this reported if the newly loaded drinks were cold. An ubiquitous computing seminal paper by mark weiser in 1991. "The computer of 21st century", as well as versus such as UBI comp and per comp which also provided vision that is complimentary on IOT. REZA RAJI in 1994 described concept in spectrums that is moving small packets of data to large set of nodes. Between 1993 and 1996 several companies began to propose solutions like Microsoft's at work on Novell's NEST. However in 1999 (D2D) Device to Device communication by Bill Joy was part of "Six Webs" framework, which was presented at Davos the world famous economic forum.

The concept of Auto ID centre and RFID (Radio Frequency Identification) by Kevin Ashton brought the concept of all objects and people in daily life were equipped with identifies computer to manage. Further RFID, Bar Codes, QR Codes, Digital Watermarking came into existence. Further as of 2014 the vision of IOT had a wider vision, ranging from wireless communication to internet and from embedded system to MEMS. This means control system, Embedded system, wireless communication all other contributed to IOT.

Proposed System

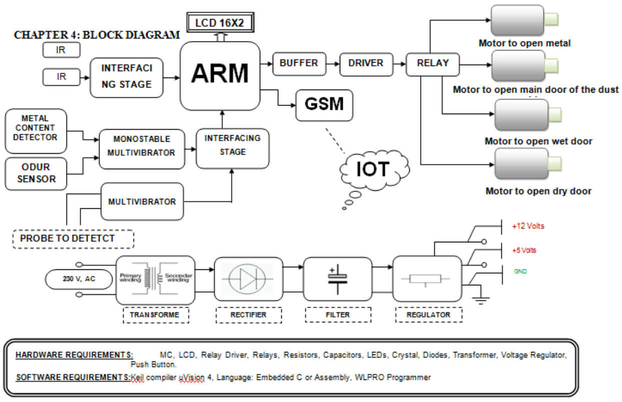
Flowchart



Block Diagram

The IR TX and IR receiver will be placed on top of the dustbins. The monitoring of the pits will be done by those sensosrs. The pit full condition is detected by respective sensors and sends to arm through multi vibrator. The received signal based on coding is analysed by ARM and the nearest person is informed via message and email. Dry and Wet Segregation : Here the IR TX and RX will be placed on pit, whenever person wants to through the garbage in bit it open, this detections is done by IR sensors, sensed signal activates motor to open the cap of dust bin. If garbage contains west portion second motor is activated when detected. If garbage contains dry waste then the third motor runs detecting dry waste. The metal detector detects the metal contents in garbage by sensor then signal flow to ARM via multivibrator.

The odour sensor is used to smell if the pit is smelling bad and signals ARM through multi vibrator and arm sends message through mail or message. If pit is full then it will be detected by sensor module and activates by GSM module and sends message through IOT.



Conclusion

For project demo concern, we have developed a prototype module. In future, this project can be taken to a product level. To make this project as user friendly and durable, we need to make it compact and cost effective. Going further, most of the units can be embedded along with the controller on a single board with change in technology, thereby reducing the size of the system.

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