SMART DUSTBIN FOR SMART CITIES

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Abstract- **In our city we have seen that garbage in dustbin is overflowing which create unsanitary condition for people, create ugliness in public surrounding result in unhealthy smell. To avoid such problem we are representing idea of garbage collection bin overflow indicator with GSM and IOT technology. We have to place level detector within ash bin. Once dirt reaches to peak value message sent to municipal authority person with location of dustbin by GPS, or usually we need to perform daily scheduling to finding this garbage bins. This scheduling varies with population of that place. In some competition and event to perform dustbin get full at once create overflow situation. So with smart dustbin implementation government authority get message at once. So they get SMS before periodic visit of finding that dustbin**

1. INTRODUCTION

The smart cities concept knew to all of us as our present prime minister gave an idea of building around 100 smart cities throughout India. To becoming smart cities we have to solve all problem faced by cities. The biggest problem faced by country is garbage, although dustbin are placed in cities still waste is not managed properly. Due to this garbage is overloaded in dustbin and it spill out. Which lead serious type of hazard such as malaria. so proper disposal of solid waste is required. In this paper we have tried to upgrade trivial but vital component of solid waste management of cities i.e. dustbin.

For becoming smart cities we required smart dustbin. with rise of technology it is high time to use technology in waste management system. In this paper we have integrated analytics with electronics for upgrading the conventional method of waste disposal with large amount of data produced by smart bin network. moment of waste across city is track, and monitored by single system and this single system is revolution for waste management in urban cities. Within this proposed system extent of waste in dustbin is detected with help of level sensor and it ceaselessly communicate with authorized control room through GSM module. Microcontroller provide interface between GSM system and detector. The interface is additionally provide to supervise required information associated with hand-picked of location. this proposed system give healthy and clean environment.

2. LITERATURE REVIEW

2.1 smart bin implementation for smart cities.

This paper gives us idea about the module required for smart bin implementation. hardware consist of PIC16F73 microcontroller, HC-SR 04, ultrasonic sensor, SIM900A GSM module,IC7805 voltage regulator, register, capacitor, crystal oscillator. This paper gives us exact idea for smart bin implementation.

2.2 City garbage collection indicator using Zigbee and GSM technology.

This paper gives us module needed for transmission of information to receiver. Most channel follow this. Previously we used GSM technology now for convenience WiFi module is set for information transmission.

2.3 internet of things: Internet scale information management with mobile analytics

3. PROPOSED SYSTEM

3.1 software and analysis

Internet of things is platform that connect object like sensor, actuators, mobile (smart phone) to the internet forming new mode of communication between things, people and between things. Internet make development in human lifestyle. Internet of things is old idea still it is in initial stage of economic development. By use of IOT in field like home automation, transportation, health, financial service make development faster.

All equipment we use in our day to day life are monitored and controlled mainly by IOT. this paper based on art of review of internet of things. Majority of method are finished with help of sensor in IOT. Sensor deployed at everyplace they convert row physical information into digital signal. Transmit this information for management purpose .by this manner we monitor setting changes in system and control them through the internet.

In smart dustbin system we indented to used mistreated level sensor to find extent of garbage in dustbins .we are using two level sensor for this purpose. level sensor send information to controller if dustbin are filled with garbage. Liquid crystal display unit show the message dustbin is filled. Location of dustbin is send by using GPS and GSM. IOT can update location on net using GPS wave .IOT is used for online updating.
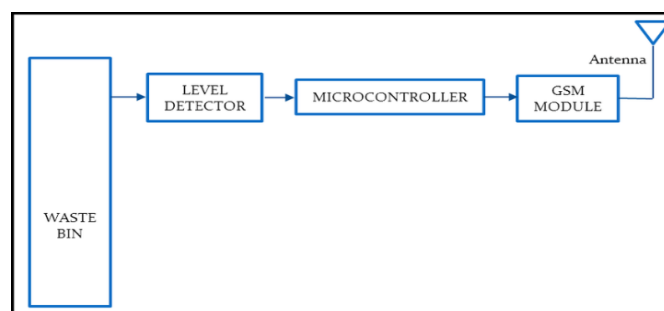

Fig 3.1 smart dustbin system

3.2 Proposed system working is divided in three layers :

Dustbin layer:

This layer consist of internet and WiFi enabled dustbin, which contain sensor that shows current filled garbage status and send it to server through IOT and also send current GPS location to server.

Server layer:

Server collect filled up status of dustbin and its position. Data is stored in database then it analyzed, processed to determine filled up status of dustbin and position of dustbin to authorized user through mobile.   process client query and response it to nearest dustbin location with direction to access dustbin.. every dustbin is equipped with ultrasonic sensor which measure filled up status of dustbin with continuous use of dustbin it filled up with garbage gradually with time. Every time when garbage crosses level sensor received data of filled up level. This data send to garbage analyzer as an instant message using GSM module. Every message received by garbage analyzer is saved for process of analysis and modeling. This data use by application interface for better view of filled up level. This data is saved in database keeping its all attribute with intact as time and date. the history of data collected in month is use by data analytics for prediction and report making. The application interface show the real time level to garbage analyzer using it direct garbage collector to collect the garbage and avoid overflowing. This predication is used for determine the time in which container get filled in near future.

Clint layer :

Clint request for nearest smart dustbin to server using mobile app designed for purpose.

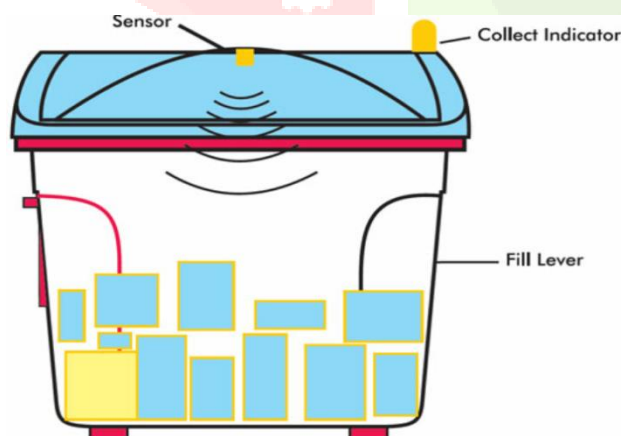**3.**3Working principal for smart dustbin:

Fig 3.2 working principal for smart bin implementation

Let l be the length of dustbin. X is current garbage filled status of dustbin. And t is time between generation of wave and propagation of wave to receiver. C is speed of light. We calculate current filled status of dustbin by formula:

$$X=l-ct/2$$

And percentage of filled up can be calculated by

$X/l*100$

3.4 system requirement:

Hardware required

3.4.1 ARM 7 microcontroller:

 the LPC 2148 depend upon 16 or 32 bit ARM7TDM1-S central processor beside 128/512 kilobytes of memory. A 128 piece wide memory interface and remarkable quickening agent design 32 bit execution code at most extreme clock rate. This microcontroller are affordable for mechanical management with low power utilization, 32 bit clock, 4 channel 10 bit ADC, PWM channel, USB port.

3.4.2 Sensor:

A series of liquid level sensor with photo transistor trigger that provide digital output which donate presence or absence of mess. It work on principal of total internal reflection. In the plastic dustbin led and photo transistor are unit are placed at interval to pinnacle of device. If liquid cover dome , the effective ratio at dome liquid boundary changes, permitting some light weight form led to cross. So number of light received by photo transistor reduced and output changes indicating presence of garbage .

3.4.3 IOT module (WiFi) :

It provide any microcontroller to access LAN network since the ESP8266 LAN module is a self contained SOC with integrated TCP/IP protocol stack. The ESP8266 is capable of uploading all WiFi networking function from another application processor and capable of hosting networking application. it come preprogrammed with AN/AT command set and able to obtain maximum amount of LAN ability as WiFi protect model. This include powerful onboard process and storage capability that integrated with sensor and another application specific devices through it GIPS with bottom development front and bottom loading through runtime. Its high degree of chip integration permit for bottom external electronic equipment, together with front end module, intend to occupy bottom PCB space. it support Bluetooth coexistence interface.

3.4.4 LCD:

LCD stands for liquid crystal display it provide as alternative of LED for communication reasons are it is low in cost. Flexibility to show number, character , graphics. LCD has simple programming for display of character and graphics. LCD is incorporating refreshing controller for digital display.

3.4.5 GPS:

The global position system is space based navigation system that gives location and time information altogether with atmospheric condition anyplace on or close to satellite where there is unimpeded line of sight of four or lots of GPSSatellite. it is freely accessible to anyone with GPS receiver.

3.4.6 GSM modem:

This GSM electronic equipment is versatile plug for direct and simple integration to RS232.

3.4.7 MAX 232

It is AN IC integrated product, that convert signal from RS-232 interface to signal appropriate to be used in TTL compatible digital logic circuit. It is dual that is both driver and receiver.

Software required:

Keil , proteus, flash magic.

4. ADVANTAGES :

Smart dustbin is easy to design by placing sensor and GSM model at closing lid of dustbin. By means of smart dustbin implementation overflowing at dustbin is stop and it is managed at real time. Using predication and routing algorithm it find shortest route. In wireless network it has better performance. It reduces cost, man power and time.

5 FUTURE SCOPE:

the problem of foul odor and manual control mobility call for future scope which include to control mechanism for removing smell of organic garbage also the need of autonomous dustbin GPS module can be implemented for path planning combine with sensor for obstacle avoidance.

As we are using principal and methodology for smart bin implementation same idea can be used for designing system for monitoring growth and maintenance of tree planted by government in tree plantation program. For protecting environment new project of planting around 1 corer is finalized by environment ministry. Trees are planted but after that there is no proper care is taken for their growth . so by using same idea of smart bin implementation we can control and monitor growth of tree . and give regular update to government authority.

6 CONCLUSION

In this way smart dustbin for smart cities is worked and generated by means of sensor, microcontroller and WiFi module. This proposed system will clean dustbin shortly once it reach to highest level and if dustbin is not clean in specific period shortly then it record shifted to upper authority who will take action against involved contractor. This technique help to observe fake report and protect corruption involve in overall management system. This reduces entire journey of garbage pickup vehicle. Thus reduces overall expenditure related garbage collection and help in cleanness in society.

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