Design of a Monitoring System for Waste Management Using IOT

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***Abstract*- Garbage is the main problem faced in India regardless of the growth of the states and the area of development. Garbage is the major problem in the under developed places It is found that most cases the trashes are spread across the road side because it is not collected on time. This trash leads to spread of disease and cause illness. There is a possibility of having some deadly disease. So, the proposed systems find the solution for the garbage disposal by designing a smart dust bin by managing the garbage. The garbage is collected, and the garbage collector sent from the control room. The smart dustbin sends the message to the control room through the sensors attached to it. The dustbin is attached with the ultrasonic sensor for detecting the level of the waste and anonymous gases which is connected to a Raspberry Pi microcontroller where it is programmed to send message to the control room if the garbage is full and also if the garbage is not disposed for a long time.**

***Index terms*- IOT, Raspberry Pi, Garbage, Sensors**

I.INTRODUCTION

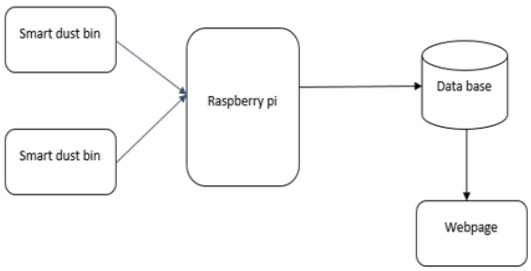
The city nowadays is aiming for smart cities. The cleaning condition in these cities is crucial. So, the objective to have a smart city by having a garbage cleaner that clears the garbage immediately. This can be done using the sensors and notify the controlling the authority in the control room through wireless communication. The system uses a less operational time cleaning the garbage in the city, which can make the city a smart city. This is easily achievable due to the GPS employed and the GUI application built in the mobile phones.

II. LITERATURE SURVEY

The smart dustbins with the internet of things are used in a scrap and public area. This could be used for waste management. This could be a Continuous finished downside at universal in addition as communal level IOT primarily based good Garbage Detection System. It's a complicated domain of technology during which all your information is keep on the cloud with real time fast access to information furthermore as its data processing IOT primarily based Waste Management. Associate Application to sensible town. Devices are connected to the network for the transfer of knowledge and to communicate with other devices with a given UID, to reduce the interaction from person to person or with a person and a laptop Overview for Solid Waste Bin watching and assortment System. Solid waste is associate degree enhancing issue that impact thanks to apace of accelerating urbanization and economic development witnessed by the quantity of municipal hard waste Operative Waste collection with Unswerving Path Semi-Static and Dynamic Routing. Sensible cities square measure subsequent step in human habitation aiming at economic integration with property setting. Future web and IoT alter little devices to be established inside the backbone of the human society in world objects just like the waste bins Intellectual System for Valorizing Hard Inner-city Waste. From Associate in nursing environmental position is imperative to seek out effective education solutions for voters to actively participate in exercise the waste created to considerably cut back the ecological footprint and therefore the scarce of natural resources Robust Waste assortment exploiting value potency of IoT potentiality in good Cities. Civil habitation presently can move to giant urban areas therefore forming Brobdingnagian cities. These cities can

incorporate heap parts in their backbone infrastructure therefore sanctioning innovative services. Protected trendy aid System based on net of Things and Secret Sharing of IoT aid knowledge it's the rising technology nowadays. Smart town policies and abstraction approach. The third a part of the paper includes recommendations for the event of sensible cities supported the combined conclusions of the previous components. Smart Garbage observance System. Garbage could contain the unwanted material left over from town, Public space, Society, College, home etc. This project is said to the "Smart City" and supported "Internet of Things" (IOT). So, for sensible modus vivendi, cleanliness is required, and cleanliness is starting with Garbage Bin.

III.BLOCK DIAGRAM



IV. HARDWARE USED IN OF WASTE MANAGEMENT SYSTEM

IOT are connected to the web and controlled by the user through the internet and can also be called as web of things. The IOT is used with the hardware components to collect the data like the sensor that senses and gives the data to the IOT devices. Some of the hardware components used is described below.

A. Ultrasonic sensor

Ultrasonic sensors are used to calculate the distance between the objects by acoustic waves. The period taken For sound wave production and active use is also calculated.

B. Raspberry pi

Raspberry is a low-cost microcontroller designed to work with the sensors and other software that can be programmed on it. The program can be done on this using python.

c. 16x2 LCD Modules

A liquid crystal display is a thin, flat panel used for electronically displaying information such as numbers, characters and special charecotrs. Hence used here for displaying the status of dustbin and modes in which device is running.

V. IOT TECHNOLOGY

Internet of Things (IOT) is a technology that is transforming slowly for the city administration. The cities will generate a waste at an alarming rate, so waste must be collected in s smarter way in easily manageable time in real time. The waste disposal mechanism should have more efforts in collecting the waste by selecting the optimal path. The methods done earlier were collecting the waste with smart bin in the place and plan an optimal trip which is not considered. The proposed work using IOT technology does the management of waste with the management of trip in the cities. The cost and time are reduced with optimized path for waste gathering. Thus, the planned effective results for same. In current times, garbage disposal has become a giant cause for concern in the world. A huge amount of waste that is produced is inclined by Means catch have an opposing consequence on the environment. The communal technique of removal of the waste is by unexpected and unrestrained open selling at the low-lying sites. This technique is harmful to human

fitness, plant and animal life. In India, duster pickers play a crucial role within the utilization of urban solid waste. The amount of the waste generated be situated completed if it's recycled fully. We area unit implementing a wise ash-bin that may be a low cost, simple to use resolution for a segregation system at households, in order that it will be sent directly for procedure. It is calculated to sort the recycle into degradable waste and bio - degradable waste. It will also to inform the concerned person when the bins are full through IOT.

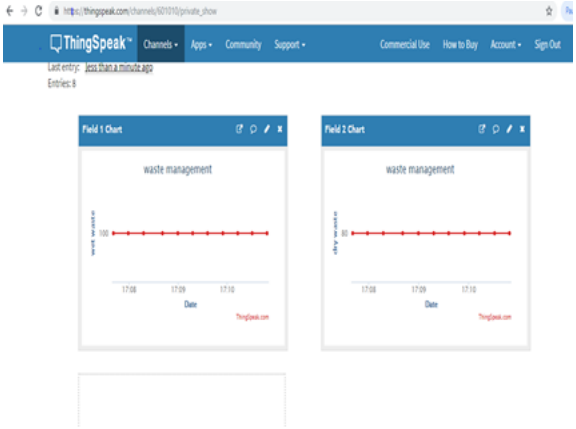
VI. WORKING

The Smart Bin is the process of predicting the waste filling percentage and detecting the nasty smell and level of filling the machine learning is the part where the prediction takes place. The Model is trained according to the level of dustbin and filling period. So that when it detects the level of waste it will predict when the bin will be filled. Then the status of the dustbin will be mailed to the municipality. The Ultrasonic sensor will find the depth of the waste filled if the depth was low it will automatically send a messages to municipality office webpage through the Wi-Fi. The municipality will handle the disposal method and the main objective is it will save the time and Fuel of dump truck. It optimizes the work of the routine.

VII. RESULTS

The system was checked repeatedly by increasing and decreasing the level of garbage in the bin. Notification was sent each time the level got changed. The user checked the notification was checked by the user on the thing speak, so it can be said that the system has worked in the way we planned. Proper security was also given to the hardware components so that the output which comes is accurate because further actions have to be taken based on the output.

The data on the Thing Speak will shows the percentage for each bins to make sure the waste management can monitor. If the bin is full, the waste management can inform to collector to collect the garbage. So, collector can do their duties without any problem.



VIII. CONCLUSION

We have implemented a garbage management system by using smart dustbins to check the level of smart dustbins whether the dustbins is full or not. In this system when garbage is full the information is sent to the authorized person. By implementing this proposed system we can develop the smart city concept and cost is reduced. By the effective usage of smart dustbins can the resource is optimized. This system reduces the traffic in the smart city so that the environment will be cleaned. The existed system will inform the status of the garbage in each and every dust bin so that the concerned authority can send the garbage collection vehicle only when the dustbin is full.

REFERENCES

[1] Trushali S. Vasagade, Shabanam S. Tamboli, Archana D. Shinde, "Dynamic Solid Waste Collection and Management System Based On Sensors, Elevator and GSM", International Conference on Inventive Communication and Computational Technologies (ICICCT 2017)

[2] P Haribabu1, Sankit R Kassa1, J Nagaraju1, R Karthik1, N Shirisha2, M Anila2, "Implementation of a Smart Waste Management

system using IoT", Proceedings of the International Conference on Intelligent Sustainable Systems (ICISS 2017) IEEE Xplore Compliant - Part Number: CFP17M19-ART, ISBN: 978-1-5386-1959-9

[3] S. Vinoth Kumar, T. Senthil Kumaran, A. Krishna Kumar and Mahantesh Mathapati, "Smart Garbage Monitoring and Clearance System using the Internet of Things", 2017 IEEE International Conference on Smart Technologies and Management for Computing, Communication, Controls, Energy and Materials (ICSTM), Veltech Dr.RR & Dr.SR University, Chennai, T.N., India. 2 - 4 August 2017.

[4] Aaditya Jain, Ranu Bagherwal, "Design and Implementation of a Smart Solid Waste Monitoring and Collection System Based on Internet of Things", IEEE – 40222

[5] Sayan Tapadar, Suhrid Krishna Chatterjee, Robin Karlos, Sudipta Saha, Himadri Nath Saha, "Optimizing routine collection efficiency in IoT based garbage collection monitoring systems", 2018 IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC)

[6] Sagar Wadhwa, Preeti Wadhwa, Richard Joseph, Sahil Mirchandani, "IoT enabled dustbins", 2017 International Conference on Big Data, IoT and Data Science (BID)

[7] Bharadwaj B, M Kumudha, Gowri Chandra N, Chaithra G, "Automation of Smart waste management using IoT to support "Swachh Bharat Abhiyan" - a practical approach", 2017 2nd International Conference on Computing and Communications Technologies (ICCCT).