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An Automatic Smart Garbage Collection Vehicle in IOT (CATCH-RAW)

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I. ABSTRACT

In current century urbanization is exceedingly rapidly. At the same phase wastage are also taking mushroom growth. Management for wastage is lacking for pivotal services. Per capita waste generation increasing by 1.3% per annum. With urban population is increasing between 3— 3.5% / annum. Annual increase in waste generation is around 5% annually. India produces 42 million tons of municipal solid waste annually at present. Per capita generation of waste varies from 200 gm to 600 gm per capita/day. No fund is spent on treatment and disposal of waste. Crude dumping of this waste is practiced in most of the cities. Now a day around 100 cities are set to be developed as smart cities. Municipalities, in Indian cities and towns have waste collection employees and their work performance is neither measured nor monitored. Some of the few solid waste landfills India has, near its major are overflowing and poorly managed. They have become significant sources of greenhouse emissions and breeding sites for disease vectors such as flies, mosquitoes, cockroaches, rats, and oilier pests. They should reinvent garbage management in cities so that we can process waste and not landfill it. This project dedicates the smart garbage hoarder "CATCH RAW" which is controlled by microcontroller. This project is working depend upon the requirement and it has coded with Mink', and the database is connected with cloud storage which is provide the details and it can able to store the daily uses data. In front of the vehicle ultrasonic sensor is present which is used to detect human and object under the particular distance. If

anything detected, thenvehicle will stop automatically. As same concept we used in dustbin for automatically collecting. For providing power we use solar system and lithium-ion battery. This concept we followed from line follower concept to run it in defined line using P1R. sensors. Finally, all. the intimation will send to particular department using concept of GSM, with help of GPS & GPRS it will send particular location of the catch raw. The microcontroller is coded in such a direction that vehicle will move on directed path and stops in front every house for a particular time limit after collecting garbage's vehicle will shift to next door automatically. It can improve collection efficiency of garbage or solid waste up to 50% to 90%. This system must provide the protection of human health. In this approach it will swipes the issue of garbage from a given area and follows **"GO GREEN GO INDIA".** This delectable way will help our local areas to make it clean and it will reduce pollution. The success of garbage collection programs will depend to a greater extent on awareness programs among people by existing environment laws and government

KEYWORDS*- ARDUINO, GPS, GSM, SERVO MOTOR, SOLAR PANNEL, LITHIUMION BATTERY, ULTRASONIC SENSOR*

II. INTRODUCTION

Though the world is in a stage of up gradation, there is yet another problem that has to be dealt with. Garbage! Picture of garbage bins being overfull and the pi l age being spilled out from the bins can be seen all around. Which leads many epidemic causes? A massive challenge in the urban cities is solid waste management. Hence, to shrinks this burning issue catch raw is a best system which can eradicate this problem or at least reduce it to the minimum level. Our present Prime Minister of India, Sri Narendra Modi ji initiated "Swachh Bharat Abhiyaan" to ensure clean environment.

Majority of viruses -lid bacterial infections develop in polluted environment Preserving the environment using technology sources is needed atpresent. Majority of the environment seems to be polluted with thematerial. Amounts of waste is largely determined,' by two factors: first, the population in any given area, and second, its consumption patterns.

III. OBJECTIVE

- Ultrasonic sensors used to detect the object within 30Cm

- Arduino is used to connect all the modules for data transformation
- By the GSM Module the message will send to the particular department.
- IR sensor used to open the defined line.
- Servo motor used to open the dustbin door.
- Instead of normal battery the lithium battery and soh- panel will be used because it can rechargeable.

IV. METHODLOGY

A. Reason & Analysis for Smart Dust Bin

The inventor made a quantitative analysis that nowadays garbage is strewn in our locality. The study first analyses the spatial distribution of garbage collection vehicle in some area of metropolitan city of India. On the basis of we made a automatic smart garbage collection vehicle known as CATCH RAW. It is shown that number of garbage collector vehicle could not collect the garbage in timely. It is having irregularity.

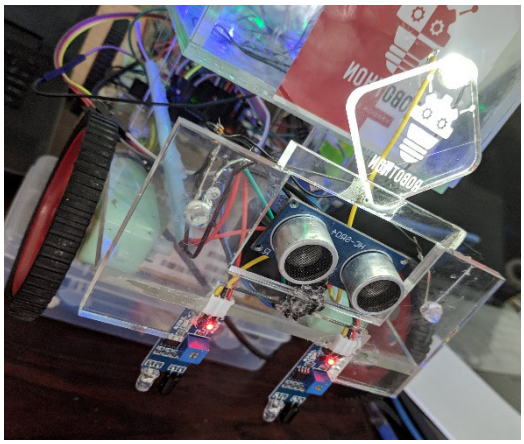
B. Working of Smart Dust Bin

The inventor has equipped the automatic garbage collection vehicle with ultrasonic sensor which is used to detect human in under the distance of 30cm. If any object or human will detect up to 30cm then vehicle will stop automatically. As same concept we used in dustbin for automatically opening. For the providing power we use solar system and lithium ion battery. We have use line follower concept to follow defined line using IR sensors. Finally, all the intimation will send to particular department using concept of GSM with particular location. The Catch Raw is working depend storage which is provide the details and it can able to store the daily uses data. The Arduino is coded in such a direction that vehicle will move on directed path and stops in front every house on that route for 2 minutes after collecting garbage's vehicle will shift to next door. The vehicle dustbin has two parts in which one of them are green garbage collector and another one is recycle garbage collector.

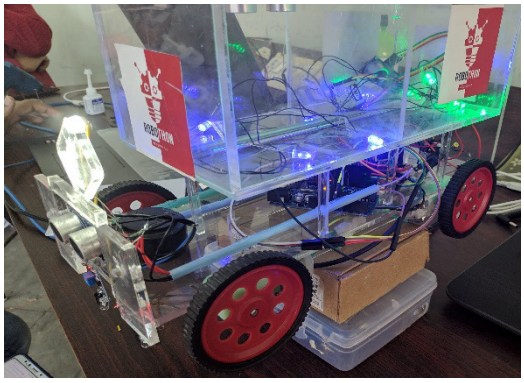
V. IMPLEMENTATION

In this paper, microcontroller is used to control the process and give the instruction to the vehicle. The ultrasonic sensor is used to detect any object and human under the particular distance. If any object or human detecting in the particular distance it will blow horn first, in case its near then it will stop once it will not detect any object or human the run again. For the smart dustbin the ultrasonic used for automatic opening the dustbin and sending the status of dustbin, if the dustbin will be filled automatically message will send to their respective department as well as the

vehicle will run directly to the department. Smart dustbin is automatic garbage collection. There are two types collection box one is Green for the Recycle products & another one for Dry products. To provide the power the Solar panel and lithium ion battery has been used. IN this vehicle we hose used line follower concept to follow the singe line that will work using IR sensor. The IR sensor will detect the color after it follows line whichwill be implemented on the Road.



In microcontroller have programmed in such way it will follow only the defined color if any another color detecting will stop for few times. To stop behind every home. w-e have used another color, once it will detect different color it will stop for few minutes and after two minutes again it will start to run in same w ay. In this approach the GSM/GPRS is also used 'o send the status of vehicle. The status is not enough for verification we need particular location, here for location tracking GPS technology has been used. In the world of increasing technology, we need high technology to complete our task. Now if ow need to monitor current status of the approaches we have to move on web application side. here we have e introduced with NodeMcu which will helps to provide the Wi-Fi connection and it will interface with we application and every data will pass through it. Using these concepts, we can able to monitor the vehicle as their current status. To store the daily garbage collection and the data of the vehicle is stored to cloud database. The vehiclecollects daily garbage from every house and stop they're for one minute or hall of the minute. It will help to avoid pollution and garbage collection problems.



VI. FUTURE WORK

In this paper, implementation is done only for an automatic garbage collection vehicle "Catch Raw". Implementation is done by principal of IOT and provides the secure in every field such as accident, accuracy, battery life. In future we would connect the vehicle to

the Artificial Intelligence and improve the software and android application. Apart from this, differentiation can be made between green garbage and recycle garbage. This help the distinguish waste at the source and hence reducing the requirement of manpower

VII. CONCLUSION

This approach controls the garbage strewn in our locality. It reduces the various features durability, affordability against the maintenance issues are addressed. This automatic garbage collection can lend a lot towards clean and hygienic environment. The garbage is recycled and produces some useful things. But these kinds of technologyare new in India. So, the proper awareness should be created by government among the public before implemented this in large scale.

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