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IOT BASED MULTIPLE GARBAGE BOX MONITORING AND MANAGEMENT SYSTEM

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ABSTRACT

The new era of Web and Internet of Things (IoT) paradigm is being enabled by the proliferation of various devices like RFIDs, sensors, and actuators. Smart devices (devices having significant computational capabilities, transforming them to 'smart things') are embedded in the environment to monitor and collect ambient information. In a city, this leads to Smart City frameworks. Intelligent services could be offered on top of such information related to any aspect of humans' activities. A typical example of services offered in the framework of Smart Cities is IoT enabled waste management. Waste management involves not only the collection of the waste in the field but also the transport and disposal to the appropriate locations. In this project, we present a comprehensive and thorough survey of waste management models. Specifically, we focus on the adoption of smart devices as a key enabling technology in contemporary waste management. We report on the strengths and weaknesses of various models to reveal their characteristics.

INTRODUCTION

In Garbage Monitoring System, Garbage may consists of the unwanted material left over from City, Public area, Society, College, home etc. This project is related to the "Smart City" and based on "Internet of Things" (IOT). So for smart lifestyle, cleanliness is needed, and cleanliness is begins with Garbage Bin. This project will

helps to eradicate or minimize the garbage disposal problem. The Internet of Things (IoT) is a recent communication paradigm that envisions near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet. This project IOT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The system makes use of Arduino family microcontroller, Wi-Fi modem for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of garbage collected in the bins. Whereas a web page is built to show the status to the user monitoring it. The web page gives a graphical view of the garbage bins and highlights the garbage collected in colour in order to show the level of garbage collected. The LCD screen shows the status of the garbage level. The system puts on the buzzer when the level of garbage collected crosses the set limit. Thus this system helps to keep the city clean by informing about the garbage levels of the bins by providing graphical image of the bins via a web page.

LITERATURE SURVEY

1. In [21], the authors propose a capacitive level-sensing model for solid waste collection. The paper presents a capacitive point-level sensor used for improved solid waste collection. the sensor is composed of two electrodes built from low-cost metal tape which has the ability to detect the volume of paper waste in the bin. The research uses a theoretical model which describes qualitatively the effects of the presence of closely related conductive outdoors or underground metallic objects. Face-to-face electrodes are proved to be less sensitive to interference from close metallic objects and the position of paper in the bin. Furthermore, the paper defines a capacitance threshold that can be applied to a certain type of bin, thus, it can depict when the bin is full. Compared with our taxonomy, in the physical

infrastructure, paper waste bin is the appropriate class. They are located either outdoors or underground. The fleet of collection trucks is homogenous and a single dump is used. Recycling of inorganic waste is also supported. Moreover, regarding the IoT Technology, in the presented system, a capacity sensor for solid waste collection is used. The software analytics part involves evaluation with synthetic experimental data. In general, the strengths of the system involve the well-defined analyses and design of the capacity sensor. However, the system does not constitute a concrete approach as it focuses strictly on the technical characteristics of a specific type of sensor.

2. In [23], the authors propose a Web-based Decision Support System (DSS) for waste lube oils collection and recycling. The DSS enables schedulers to perform interactive reverse supply chain management operations. The main goal is related to the efficient and effective management of waste lube oils collection and recycling. A model which enables intra-city and inter-city dynamic routing incorporating real-time operational constraints is proposed. Dynamic routing is based on the shortest path and hybrid met heuristics models. The paper introduces an Enterprise Resource Planning (ERP) system which enables the utilization of specific functional models and the combination with other scheduling tools. The model is evaluated with real experimental data associated with WSNs traffic and the collection trucks. The strengths of the paper are the envisioned dynamic scheduling model along with the dynamic routing. However, the paper describes only the specific type of toxic lube oil waste bin.

3. In [24], the authors propose a model for remote monitoring of charity assets to improve the efficiency of the waste collection. The paper presents the waste collection problem from the collection costs perspective of servicing a major UK charity's: (i) donation banks and (ii) collection of unsold goods from retail shops. A model from a major UK charity is proposed to monitor bank and shop servicing requirements. The dynamic models are proved to decrease collection costs compared with the existing fixed scheduling infrastructure by means of distance covered, pollution emitted and the

transported waste capacity. The physical infrastructure includes organic, glass, paper, plastic and metal waste bins located outdoors.

PROPOSED SYSTEM

In present day the dustbin is over flown, the proposed system will help to avoid the overflow of dustbin. It will give the real time information about the level of the dustbin. The proposed method for the management of wastes is efficient and time saving process. This automation of waste also reduces the human effort and consequently the cost of the whole process. This system can be implemented at any place with ease and within reasonable amount of time. The implementation costs for the automation is also affordable. The overall method for the detection and management of waste becomes efficient and intelligent. This proposed system would not only function for collecting and updating data automatically and timely, but also it could analyze and use data intelligently. The use of Internet in this automation makes this system efficient and reliable with long distance coverage.

ADVANTAGES:

- The garbage will be collected on time-to-time basis.
- There would not be any bad smell around the bin.
- Real time notification to collect the garbage.
- Saving on fuel consumption, thus reducing the threat to the environment.

WORKING

This project IOT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The system makes use of

Arduino microcontroller, Wifi modem for sending data and a buzzer. The system is powered by a 12V transformer. Whereas a web page is built to show the status to the user monitoring it. The web page gives a graphical view of the garbage bins and highlights the garbage collected in color in order to show the level of garbage collected. The system puts on the buzzer when the level of garbage collected crosses the set limit. Thus this system helps to keep the city clean by informing about the garbage levels of the bins by providing graphical image of the bins via IOT web development platform.

SYSTEM CONFIGURATION

HARDWARE USED:

- Microcontroller
- Ultrasonic Sensor
- Power supply
- WIFI
- Buzzer

SOFTWARE USED:

- Embedded C
- Arduino IDE
- Proteus

CONCLUSION

This survey's focus is on more energy-efficient IoT as an enabler of various applications including waste management. Specifically, it aims to present a large set of models dealing with the efficient waste management. Special attention is paid on the waste collection. We present efforts for the intelligent transportation within the context of IoT and Smart Cities for waste collection. We propose an

inductive taxonomy to perform comparative assessment of the surveyed models. We deliver the strengths and weaknesses of the surveyed models. Finally, our future work is focused on the definition of an effective IoT-enabled model for waste collection, which will touch on the incorporation of high capacity waste trucks as mobile depots. In addition, waste bins are placed to optimize comfort of residents. However, as part of the future work we will be looking at bin connectivity constraints that may affect their placement, for example, the output power of a communicating sensor would need to be set too high which may drain the battery faster. In this case, the bin may be placed somewhere where energy consumption is more efficient.

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