ANNAI VEILANKANNI'S COLLEGE OF ENGINEERING

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BATCH NO : B1-1M3E

LITERATURE SURVEY
SMART WASTE MANAGEMENT SYSTEMS

TOPIC1:

IoT-Based Smart Waste Management Systems for Revolutionary Changes

AUTHORS:

https://evreka.co/blog/iot-based-smart-waste-management-systems/

ABOUT:

Our waste generation is constantly growing to form a **global garbage crisis**. Even though we compromise on creating a more sustainable and green world with 2050 climate targets before too late, we still fail to recycle or handle our waste generation. Combining technology support with a vision of social, economic and environmental sustainability is the only way out of this problem. **Solutions for smart cities,** of course, go through IoT technology, making it easier for us to perceive objects and communicate. From day to day, countries, regions, cities, and municipalities embrace the ‘’smart’’ systems and solutions in their operations. Accordingly, key waste management players are already

operating with digitized solutions. So, IoT technology is a crucial step to embed in your operations.

LIMITATIONS:

1.Increasing cost of the dustbin.

2.for ex: There are 3 different levels of sensors.

3.One sensor for each level.

4.Also rough action and usage of the user may cause damage to the sensor.

TOPIC2:

Smart Waste Management System for Crowded area

AUTHORS:

https://ieeexplore.ieee.org/document/8645576?denied=

ABOUT:

In implementing the smart cities the great challenge is how to manage waste with low cost and high performance. Three factors make it a big challenge, behind its natural, small area, short period of time and the increasing of the Pilgrimages' member. The process of collected wastes, separated it, and transports the containers daily and quickly to avoid any prospect of a spread of diseases is a complex process. This paper aims to study the concept of the waste management and proposed smart systems for waste management system with recycling .The proposed system will use the sensors technique inside the container, as a lower level, to separate the waste into 4 categories [food, plastics, papers, and metal] and use actuator at a top level to inform the management system to collect the container. The proposed system will save time, money and efforts compared to the recent process of the waste management system and improve the society quality as all.

LIMITATIONS:

TOPIC3:

1.insufficient data collection.
2.quality aspects-recycling.
3.energy recovery of waste.

Smart Waste Management using Wireless Sensor Network

AUTHORS:

https://www.researchgate.net/publication/344664441_Smart_Waste_Management_using_Wireless_Sensor_Network

ABOUT:

In most of the places, the garbage bins are not cleaned at proper time intervals which results in overflowing of garbage resulting in hygiene problems, land pollution; also it creates ugliness to that place. This shows the need for a system that monitors the status of the garbage bin and provides information to the concerned authorities to manage the collection intervals for cleaning the bins. A solution to this problem is proposed in this paper in the form of a 3 tier waste management system: Intelligent bin, gateway, remote base station. The parameters of the bin monitored are transmitted through a gateway to remote base station to be stored in a database.

LIMITATIONS:

1.It is prone to hacking by hackers.

2.Cannot be used for high speed communication.

3.Expensive to build.

TOPIC5:

Smart waste management for green environment

AUTHORS:

https://ieeexplore.ieee.org/document/8075303

ABOUT:

The objectives of the project are to design a Smart Waste Management (SWM) system based on Bootstrap platform, develop the system and test its functionality in fulfilling the requirements of the project. The methodological approach selected in this project is the waterfall methodology in which it comprises of four crucial phases: planning and analysis, system design, system implementation and system testing whereby each phase must be completed systematically prior to the commencement of subsequent phase. It is expected that the Smart Waste Management (SWM) system would be able to fulfill all of the project's objectives. This system is aimed to address the problems of overflowing trash bins and public complaints on trash collection trucks. The development of this system brings a huge significance in which operators would be able to know which trash bins require immediate collection and request for immediate dispatch by collection trucks.

LIMITATIONS:

1.The site are often dangerous.
2.The resultant product has short life.
3.The practices are not done uniformly.

Smart Waste Collection System Based on Location Intelligence

AUTHORS:

https://www.sciencedirect.com/science/article/pii/S1877050915030008

ABOUT:

TOPIC 10

Cities around the world are on the run to become smarter. Some of these have seen an opportunity on deploying dedicated municipal access networks to support all types of city management and maintenance services requiring a data connection. This paper practically demonstrates how Internet of Things (IoT) integration with data access networks, Geographic Information Systems (GIS), combinatorial optimization, and electronic engineering can contribute to improve cities' management systems. We present a waste collection solution based on providing intelligence to trashcans, by using an IoT prototype embedded with sensors, which can read, collect, and transmit trash volume data over the Internet. This data put into a spatio-temporal context and processed by graph theory optimization algorithms can be used to dynamically and efficiently manage waste collection strategies.

LIMITATIONS:

1.Waste management can cause more problems.
2.Process is always not cost effective.

Smart Waste Management System For Metropolitan Cities

Author :

Mohammad Aazam

Year of Publishing: 2016

Description:

Mohammad Aazam provides the idea of sensors-based waste bins, capable of notifying waste level status. An automatic waste bin and make use of cloud computing paradigm to evolve a more robust and effective smart waste management mechanism. Waste management is linked to different stakeholders, including recyclers, importers and exporters, food industry,

healthcare, research, environment protection and related organizations, and tourism industry Mohammad Aazam et al proposed Cloud SWAM, in which each bin is equipped with sensors to notify its waste level. Different bins for each category of waste, namely: organic, plastic/paper/bottle, and metal. In this way, each type of waste is already separated and through the status, it is known that how much of waste is collected and of what type. The availability of data stored in the cloud can be useful for different entities and stakeholders in different ways. Analysis and planning can start from as soon as waste starts gathering and up to when recycling and import/export related matters are conducted. The system Cloud SWAM provides Timely waste collection. Timely and efficient way of collecting waste leads to better health, hygiene, and disposal. Jenifer Prarthana uses tremendous power of RFID technology and presents the development of an electronic monitoring (e-monitoring) system to overcome the problems in the conventional approach. The e-monitoring system is an embedded system that comprises of RFID technology interfaced with Arduino micro-controller and a web base which is completely computerized. Jenifer Prarthana uses tremendous power of RFID technology and presents the development of an electronic monitoring (e-monitoring) system to overcome the problems in the conventional approach. The e-monitoring system is an embedded system that comprises of RFID technology interfaced with Arduino micro-controller and a web base which is completely computerized.

TOPIC 10

Author Name:

Belal Chowdhury ,Morshed U. Chowdhury

Year Of Publishing: 2007

Description:

An RFID-based waste management system proposed by Belal Chowdhury and Morshed U. Chowdhury mainly consists of a smart waste (RFID) tag, a Reader and a waste management IT system (i.e., WMITS). A load cell is used to record the weight of bulk waste from each waste bin. A reader device attached to the PDA (Personal Digital Assistant) or a smart phone placed in waste collector vehicle (garbage/recycling truck) enables the chip to transmit its unique identification to the reader device, allowing the bin to be remotely identified. A RFID reader on each waste collector vehicle will ensure that the weight and identity of the waste is passed to the PDA and automatically logged into an integrated database server. The RFID reader can also request any additional information from the waste tag that is encoded on it. When robotic/lifting arms in the waste collector loaded onto the vehicle then the weighting measures the weight of each bin. The bin ID is then used to calculate actual waste disposal charges for each individual household. Belal Chowdhury and Morshed U. Chowdhury designed a five layer architecture for RFID and sensor based waste management system. The layers are named as physical layer, middleware layer, process layer, data access layer and user interface layer. The physical layer consists of the actual RFID hardware components and it include RFID waste tag, reader and antennas. Middleware layer is act as the interface between the RFID reader, load cell sensor and waste management service providers (i.e., waste collectors, and municipalities) IT system. The important element of

TOPIC9:

RFID and load cell sensor systems is middleware layer , which is viewed as the central nervous system from the waste management system perspective. This layer enables waste management service provider's (e.g., waste collector) a quick connectivity with RFID readers and load cell sensors and also the layer lowers the volume of information that waste management system applications need to process, by grouping and filtering raw RFID and load cell data from readers and sensors respectively

Author Name:

Fachmin F olianto, Yong Sheng Low and Wai Leong Yeow

Year Of Publishing: 2015

Description:

Fachmin F olianto, Yong Sheng Low and Wai Leong Yeow proposed Smart bin system has 3 –tier architecture. The ultra sound sensor installed in every Smart bin senses bin fullness and report readings and sensor statuses. The sensor reading is transmitted to the gateway nod which is installed in every sensor cluster. It forwards the information to the backend server. The analytics module in the back end server analyzes data collected by the bin sub system. The analytics module processes fullness readings, compares against predefined rules, and generates event upon exceeding threshold. The bin sub-

system sends information to the workstation and it shows meaningful information to users through a graphical user interface.

Author Name: Keerthana betal

TOPIC11:

Year Of Publishing: 2017

TOPIC 10

TOPIC13:

Description:

Keerthana b et al designed internet of bins for trash management in India. The smart TRASH management system using sensor, microcontroller and other modules ensures emptying of dustbins appropriately when the garbage level reaches its maximum. Two threshold limits are set for the bins and an alert message is sent to the van that collects the trash if the waste amount reaches these thresholds. The system further allows the people to drop down the trash bags into the bins till it reaches the threshold limit .It waits for the acknowledgment from the van to clear off the bin and if the acknowledgment is not received it is sent again when it reaches threshold limit and the bin gets locked. When bin gets locked it displays the message “Overloaded”. Then the dustbin will be monitored for a specific time and when not cleared within certain time limit, then a message will be sent to the higher authority who can take appropriate action.

TOPIC 10

TOPIC15:

Author Name: Belal Chowdhury ,Morshed U. Chowdhury
Year Of Publishing: 2007

Description:
An RFID-based waste management system proposed by Belal Chowdhury and Morshed U. Chowdhury mainly consists of a smart waste (RFID) tag, a Reader and a waste management IT system (i.e., WMITS). A load cell is used to record the weight of bulk waste from each waste bin. A reader device attached to the PDA (Personal Digital Assistant) or a smart phone placed in waste collector vehicle (garbage/recycling truck) enables the chip to transmit its unique identification to the reader device, allowing the bin to be remotely identified. A RFID reader on each waste collector vehicle will ensure that the weight and identity of the waste is passed to the PDA and automatically logged into an integrated database server. The RFID reader can also request any additional information from the waste tag that is encoded on it. When robotic/lifting arms in the waste collector loaded onto the vehicle then the weighting measures the weight of each bin. The bin ID is then used to calculate actual waste disposal charges for each individual household. Belal Chowdhury and Morshed U. Chowdhury designed a five layer architecture for RFID and sensor based waste management system. The layers are named as physical layer, middleware layer, process layer, data access layer and user interface layer. The physical layer consists of the actual RFID hardware components and it include RFID waste tag, reader and antennas. Middleware layer is act as the interface between the RFID

reader, load cell sensor and waste management service providers (i.e., waste collectors, and municipalities) IT system. The important element of RFID and load cell sensor systems is middleware layer , which is viewed as the central nervous system from the waste management system perspective. This layer enables waste management service provider's (e.g., waste collector) a quick connectivity with RFID readers and load cell sensors and also the layer lowers the volume of information that waste management system applications need to process, by grouping and filtering raw RFID and load cell data from readers and sensors respectively. An application-level interface is provided by middleware layer for managing RFID readers, and load cell sensors for processing large volumes of waste data for their applications. The middleware layer is responsible for monitoring physical layer components.

Author Name:

Fachmin F olianto, Yong Sheng Low and Wai Leong Yeow

Year Of Publishing: 2015

Description:

Fachmin Folianto, Yong Sheng Low and Wai Leong Yeow proposed Smart bin system has 3 –tier architecture. The ultra sound sensor installed in every Smart bin senses bin fullness and report readings and sensor statuses. The sensor reading is transmitted to the gateway nod which is installed in every sensor cluster. It forwards the information to the backend server. The analytics module in the back end server analyzes data collected by the bin sub system. The analytics module processes fullness readings, compares against predefined rules, and generates event upon exceeding threshold. The bin sub-system sends

information to the workstation and it shows meaningful information to users through a graphical user interface.

Author Name: Keerthana betal

Year Of Publishing: 2017

TOPIC 10

TOPIC19:

Description:

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