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Department of Electronics and Communication Engineering

HX8001 - PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

SMART WASTE MANAGEMENT SYSTEM FOR METROPOLITAN CITIES

Domain of the Project : Internet of Things
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Objectives

- To assess the activities involved for the proposed and determine the type, nature and estimated volumes of waste to be generated.
- To identify any potential environmental impacts from the generation of waste at the site.
- To recommend appropriate waste handling and disposal measures / routings in accordance with the current legislative and administrative requirements.

Abstract

- This Waste management is one of the serious challenges of the cities, the system now used in cities, we continue to use an old and outmoded paradigm that no longer serves the entail of municipalities, Still find over spilled waste containers giving off irritating smells causing serious health issues and atmosphere impairment.
- The Smart Waste Management System will simplify, with the Web applications and mobile phone, the solid and hydric waste inspecting process, and the management system of this presentation's total collection process.

Introduction

- Smart waste management focuses on solving the previously mentioned solid waste management problems using sensors, intelligent monitoring systems, and mobile applications.
- The first smart waste management solution to make the waste collection process more efficient is sensors.
- Sensors can measure the fill level of the containers and provide updated information at any time and notify waste management services to empty them when they are full or almost full.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Modern and smart technologies for efficient waste disposal and management	Anirban Goutam Mukherjee &2021	Journal of Environmental Management 297, 113347, 2021	Pollution and the generation of vast waste quantities with no proper waste management process have become one of humanity's biggest threats.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Smart technologies for promotion of energy efficiency, utilization of sustainable resources and waste management	Sandro Nižetić, Nedjib Djilali, Agis Papadopoulos&2019	Journal of cleaner production 231, 565-591, 2019	The role of smart technologies can become very important and useful to solve the main population issues nowadays and provide foundations for a sustainable future. A smart approach is an opportunity for knowledge integration, necessary to solve crucial problems of contemporary societies.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Waste Management System Using IoT-Based Machine Learning in University	Tran Anh Khoa,Pham Duc Lam&2020	Research Article | Open Access Volume 2020 | Article ID 6138637	Along with the development of the Internet of Things (IoT), waste management has appeared as a serious issue. Waste management is a daily task in urban areas, which requires a large amount of labour resources and affects natural, budgetary, efficiency, and social aspects. Many approaches have been proposed to optimize waste management, such as using the nearest neighbour search, colony optimization, genetic algorithm, and particle swarm optimization methods.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Smart waste bin system	Ayodeji Noiki, Sunday A Afolalu&2021	IOP Conference Series: Earth and Environmental Science 655 (1), 012036, 2021	The recent urbanisation in the developing nations of the world, rise in population, increase in human activities. Pattern of production and consumption has resulted to generation of huge amount of waste that must be properly disposed, treated and managed to ensure sustainable environment and a decent living for the increased population.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
IoT-Based Solid Waste Management Solutions: A Survey	Kellow Pardini& 2019	Journal of sensors and Actuator Networks	With the increase of population density and the rural exodus to cities, urbanization is assuming extreme proportions and presents a tremendous urban problem related to waste generation. The increase of waste generation has been considered a significant challenge to large urban centers worldwide and represents a critical issue for countries with accelerated population growth in cities.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Smart Waste Management System using IOT	Tejashree Kadus , Pawankumar Nirmal , Kartikee Kulkarni&2020	Journal Paper ID : IJERTV9IS040490	The paper is based on the concept of Automation used in waste management system under the domain of Cleanliness and Hygiene. Dumping garbage onto the streets and in public areas is a common synopsis found in all developing countries and this mainly end up affecting the environment and creating several unhygienic conditions.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
IoT-Enabled Smart Waste Management Systems for Smart Cities: A Systematic Review	INNA SOSUNOVA AND JARI PORRAS&2022	Digital Object Identifier 10.1109/ ACCESS.2022.3188308	With urbanization, rising income and consumption, the production of waste increases. One of the most important directions in the field of sustainable development is the design and implementation of monitoring and management systems for waste collection and removal. Smart waste management (SWM)involves for example collection and analytics of data from sensors on smart garbage bins (SGBs),

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
A Smart Waste Management Solution Geared towards Citizens	Kellow Pardini, Joel J.P.C. Rodrigues& 2020	National Institute of Telecommunications (INATEL), Santa Rita do Sapucaí-MG 37540-000, Brazil	Global industry is undergoing major transformations with the genesis of a new paradigm known as the Internet of Things (IoT) with its underlying technologies. Many company leaders are investing more effort and money in transforming their services to capitalize on the benefits provided by the IoT. Thereby, the decision makers in public waste management do not want to be outdone,

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Healthy Environment Using Cloud IoT Core	Parimita Das&2019	Conference: 2019 International Conference on Applied Machine Learning (ICAML)	Environment plays an important role for human being to lead a smooth and healthy life. There exist so many factors which affect the healthy environment accross our society. One of the reason for unhealthy environment is the incapability of collecting the garbage in proper time. Citizens use to place the garbage in and around the free space and also on the public road. Due to rapidly growing population

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
How Do Knowledge Management Resources and Capabilities Pay Off in Short Term and Long Term	Byounggu Choi, Heeseok Lee&2019	Management Science and Information Systems, College of Management, University of Massachusetts Boston, 100 Morrissey Blvd. Boston, MA, 02125, USA	How sustainable are the financial payoffs obtained from knowledge management (KM) resources and capabilities? To illuminate this issue, we use multiyear, firm-level survey data, as basis in examining the extent to which KM resources and capabilities influence a firm's financial performance over time.

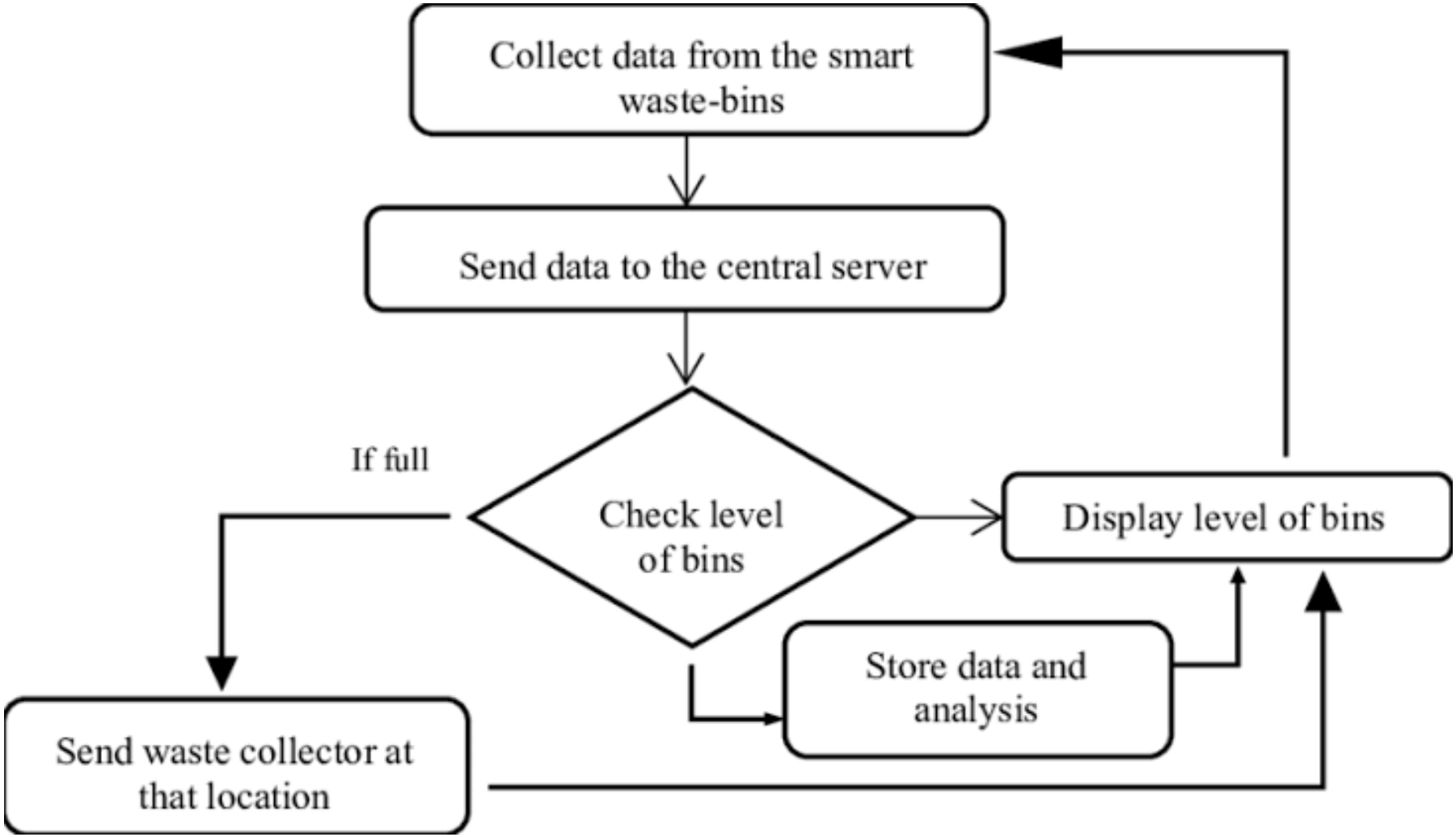
Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
A Survey of Teachers' and Students' Demands of Ideal E-Learning Management System Features during the Covid-19 Pandemic	Clara Herlina Karjo, Wiwik Andreani& 2021	Conference: 2021 International Conference on Advanced Computer Science and Information Systems (ICACSIS)	Learning Management Systems have been used in educational institutions, particularly higher education, for over a decade. Previously LMS were used to support face-to-face as well as remote or online learning. However, due to the recent COVID-19 pandemic, all educational institutions have to switch entirely to e-learning mode. In effect, some features in the current LMS should be revised, improved, or adapted to the new learning paradigm.

Problem Identification

- While smart sensors are easy to use, you cannot just buy one and install it on your waste bin. There are other steps that need to be taken after purchase to ensure its effectiveness like ensuring there is a communication technology in place for your sensor.
- Truck routes that are not optimized lead to the use of excessive fuel. In addition, some bins may end up being overfilled and others under-filled as a result.
- Having smart technology is only half the solution. The other half is ensuring that wastes are disposed of responsibly and that recyclable wastes are properly sorted.

Block Diagram



References

1. P. Suresh, Vijay. Daniel, R.H. Aswathy, Dr. V. Parthasarathy, A State-of-the-Art review on Internet of Things International Conference on Science Engineering and Management Research (ICSEMR), IEEE, DOI: 10.1109/ICSEMR.2014.7043637 19 February 2015.
2. Parkash, Prabu V IoT Based Waste Management for Smart City International Journal of Innovative Research in Computer and Communication Engineering, Vol. 4, Issue 2, DOI: 10.15680/ IJIRCCE.2016. 0402029, February 2016.
3. Evaluation on the Performance of Urban Domestic Sewage Treatment Plants in China – 2011 Dongmei Han; Guojun Song
4. M. Arebey, M. Hannan, H. Basri, and H. Abdullah, "Solid waste monitoring and management using RFID, GIS and GSM", The IEEE Student Conference on Research and Development (SCOReD), 16-18 November 2009, UPM Serdang, Malaysia, 2009.
5. M. Hannan, M. Arebey, R. A. Begum, and H. Basri, "Radio Frequency Identification (RFID) and communication technologies for solid waste bin and truck monitoring system", Waste Management, Vol. 31, pp. 2406-2413, 2011.

References

6. Waikhom Reshmi, RamKumar Sundaram, M. Rajeev Kumar, Sensor Unit for Waste Management: A Better Method,, International conference on Science, Engineering and Management Research, Â©2014 IEEE.
7. S. Longhi, D. Marzioni, E. Alidori, G. Di Buo, M. Prist, M. Grisostomi, et al., "Solid Waste Management Architecture Using Wireless Sensor Network Technology", The 5th International Conference on New Technologies, Mobility and Security (NTMS), 7-10 May 2012, Istanbul, pp. 1-5, 2012. 147

Questions & Discussion

THANK YOU