

Ideation phase

Literature Survey

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Project Name	Smart Waste Management System for Metropolitan Cities

Literature Survey:

IOT Based Smart Garbage alert system using Arduino UNO [1]: This paper 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. For the verification process RFID tag (ID card of the cleaner) interrupts the RFID reader, the ultrasonic sensor checks the status of the dustbin and sends it to the web server. An android application is used to view the alerts and status at the server end.

RFID-based Real-time Smart Waste Management System [2]: In this paper 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.

Smart Recycle Bin a Conceptual Approach of Smart Waste Management with Integrated Web based System [3]: This paper proposed a Smart Recycle Bin that caters for recycling glass, paper, aluminum can and plastic products. It automatically evaluates the value of the wastes thrown accordingly and provide 3R card. The recycle system enables collection of points for performing a disposal activity into designated recycle bins. Such system encourages recycling activities by allowing the points to be redeemable for products or services.

Smart bin: Smart Waste Management System [4]: Proposed Smart bin system has 3 –tier architecture. The ultra sound sensor installed in every Smart bin sense 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 bin sub-system sends information to the workstation and it shows meaningful information to users through a graphical user interface.

Sustainable development of smart cities: A systematic review of the literature [5]: This paper discusses environmental sustainability and smart city concept. The SLR focuses on theoretical basis concepts of both sustainability and smart city, their relationships, issues, proposed works and strength and weaknesses of related works.

A Low Power IoT Sensor Node Architecture for Waste Management Within Smart Cities Context [6]: proposed an IoT-based Waste Management System architecture using low-powered sensors as its

nodes. This architecture design uses LoRa LPWAN (Low Power Wide Area Network) technology in order to reduce energy consumption thus extending the nodes' battery lifespan. The low power architecture is achieved by implementing no electrical grid connection in the smart bin side, instead, the nodes are expected to be running on batteries or energy storing cells such as solar panels.

Smart City Service Monitoring and Waste Collection [7]: This paper proposing a smart city service for monitoring and waste collection using low-cost and open-source technologies. The proposed system is further divided into five subsystems which are Smart Waste System, Local Station, Smart Monitoring and Controlling, Smart Truck System and Smart Monitoring and Controlling Interface.

References:

- [1] Dr. N. Sathish Kumar, B. Vijayalakshmi, R. Jenifer Prarthana, A.Shankar, (2016), "IoT Based Smart Garbage alert system using Arduino UNO ".
- [2] Belal Chowdhury, Morshed U. Chowdhury, (2007) "RFID-based Real-time Smart Waste Management System", Australasian Telecommunication Networks and Applications Conference, December, Christchurch, New Zealand.
- [3] Mohd Helmy Abd Wahab, Aeslina Abdul Kadir, Mohd Razali Tomari and Mohamad Hairol Jabbar (2014), "Smart Recycle Bin a Conceptual Approach of Smart Waste Management with Integrated Web based System ".
- [4] F achmin F olianto, Y ong Sheng Low, Wai Leong Yeow, (2015) "Smart bin: Smart Waste Management System", Tenth International Conference on Intelligent Sensors, Sensor Networks, and Information Processing (ISSNIP) Singapore.
- [5] E. P. Trindade, M. P. F. Hinnig, E. M. da Costa, J. S. Marques, R. C. Bastos, and T. Yigitcanlar, "Sustainable development of smart cities: A systematic review of the literature," J. Open Innov. Technol. Mark. Complex., vol. 3, no. 3, 2017.
- [6] M. Cerchecci, F. Luti, A. Mecocci, S. Parrino, G. Peruzzi, and A. Pozzebon, "A Low Power IoT Sensor Node Architecture for Waste Management Within Smart Cities Context," Seors, vol. 18, no. 4, p. 1282, Apr. 2018.
- [7] S. A. Hassan, "Smart City Services Monitoring and Waste Collection," Near East University, 2016.