IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

SURVEY ON SMART MANHOLE MANAGEMENT SYSTEM

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Abstract: A smart megacity is the unborn thing to have cleaner and better amenities for the society. Smart underground structure is an important point to be considered while enforcing a smart megacity. Drainage system monitoring plays a vital part in keeping the megacity clean and healthy. Since homemade monitoring is unskillful, this leads to slow running of problems in drainage and consumes further time to break. To alleviate all these issues, the system using a wireless detector network, conforming of detector bumps is designed. The proposed system is low cost, low conservation, IoT grounded real time which cautions the managing station through an dispatch when any manhole crosses its threshold values. This system reduces the death threat of homemade scavengers who clean the underground drainage and also benefits the public.

Index Terms **– Smart megacity, Drainage system, IoT.**

I. INTRODUCTION

An integral a part of any system is that the access points into it when it involves cleaning, clearing, and examination. Metropolitan metropolises have espoused underground system and therefore the megacity's external pot must maintain its cleanliness. However, spring water gets defiled causing contagious conditions, If the sewage conservation isn't proper. Blockages in rainspouts during thunderstorm season, causes problems within the routine of the general public. Hence, there should be a installation within the megacity's pot, which cautions the officers about blockages in seamsters, their exact position and also if the manhole lid is open automatically. Underground drainage consists of facility, gas channel network, water channels, and manholes. Temperature detectors are accustomed cover electrical power lines that are installed underground. Pressure detectors are stationed to avoid manhole explosions thanks to chemical release and power. So, the most focus of this design is to convey a system which monitors water position, atmospheric temperature, water inflow and poisonous gases. However, manhole lid opens, it's tasted by the detectors and this data is transferred to the corresponding managing station via transmitter located in this area, If drainage gets blocked and sewage water overflows. Conservation of manholes manually is tedious and dangerous thanks to the poor environmental conditions outside. It is, thus dangerous to travel inside the manholes for examination of its current state. to interrupt all the issues associated with underground sanitation, a distant device is important for transmitting data collected by the detectors set inside the manhole to the managing station. This design uses Wireless Sensor Networks (WSN) to use this method. These bumps are composed of regulator, memory, transceiver and battery to produce power.

II. LITERATURE SURVEY

A Smart City is a vicinity peopled with electronic detectors which provides data that helps to manage means and coffers effectively. it's the results of faster development of the new age information technology. Smart metropolises incorporate information and communication technology (ICT) and detectors together with Internet of Effects (IoT) at its core (1). Electronic services and operations of informatics has come a relief way of life and commerce between individualities and government. The blending of technology with mortal coffers has led to the emergence of a wise life moving, at an accelerated pace and fluently within the design and form, that characterized by the convenience, speed and delicacy within the delivery of public services and do business. This paper presents the most operations of smart live that starting from diggings, workplaces and also the way people are transported, living and learning within metropolises. (1) Also enhances quality and effectiveness of external services. Smart metropolises help the authority to connect with the city services and to review the circumstances within city and thus the way it's evolving. The proposed Smart City design helps to boost the standard of water. It helps produce more effective and cost-effective external services and keeps citizens informed. Polluted water bodies are a vital asset of metropolises. With the growing population in metropolises, it's ineluctable that wastewater will grow and water sources will get defiled.

The Internet of Effects (IoT) is defined as a paradigm during which objects equipped with detectors, selectors, and processors communicate with each other to serve a meaningful purpose. during this paper, we survey state-of-the- art styles, protocols, and operations during this new arising area. This check paper proposes a completely unique taxonomy for IoT technologies, highlights variety of the foremost important technologies, and biographies some operations that have the eventuality to produce a striking difference in mortal life, especially for the else abled and therefore the senior. As compared to analogous check papers within the area, this paper is much further comprehensive in its content and completely covers utmost major technologies gauging from detectors to operations. (2) Smart City design performs real- time water quality monitoring. Adverse goods of the pollution are frequently

limited by needed conduct. The Smart City conception demands the objectification of knowledge technologies to render the use of energy and other coffers more efficiently. Three major Smart City features are communication, instrumentation, and intelligence. These are fulfilled with the backing from IoT. IoT computing conception describes the connection of physical objects to the net and being intelligent to identify themselves to other bias. comprises of detectors, Network subcaste contains standard communication protocol to reuse information on the needed network and Operation subcaste (2). IoT is important because an object which can emblematize itself digitally becomes commodity more important than the thing by itself. Detectors are installed and are connected to the online network using specific protocols for communication and knowledge exchange. this can be done to attain position, monitoring, tracking etc within the civic areas. The knot subcaste of IoT armature comprises of Wireless Sensor Networks (WSN). WSN consists of small bias named as bumps. These bumps include bedded CPU, limited computational power and detectors which are smart, which form a wireless detector network furnishing seeing services and monitoring (3). It's a scalable network able of mapping large areas in real- time. the event of the IoT with connected bias, improves the rigidity and class of WSN (7). Distances, power consumption, figures of bumps are some rudiments which decide the tactic of transmitting the collected data. LPWAN which can be a coffee power wide area network is used within the proposed system. it's stylish fitted to enforcing systems which bear bias for transmitting small quantities of information to long distances, for kind of times with one battery (4). Arduino Uno water turbidity hand has been successfully designed and made. This tool is made using LDR as detector and led as a light- weight source to measure the water turbidity value and Arduino Uno for processing. The actuality of this tool is formerly familiar and comfortable to hunt out. Still, the price is fairly advanced to make this tool is just possessed by certain circles only. Nephelometric System could also be a fashion of measuring the turbidity of water by passing a light- weight source on water so as that the intensity of sun reflected by the substances causing turbidity is known. With the use of led as a featherlight- weight- weight source and photodiode as a light sensor, and combined with processing using Arduino Uno also the voltage attained from the LDR detector within the kind of analog data is reused into digital data and might be displayed within the TV. (6)

With the accelerated development of Internet-of- Effects (IoT), wireless detector networks (WSNs) are gaining significance within the continued advancement of knowledge and communication technologies, and are connected and integrated with the web in vast artificial operations. Still, given the factual fact that the bulk wireless detector bias are resource constrained and operate batteries, the communication outflow and power consumption are thus important issues for WSNs design. so as to efficiently manage these wireless detector bias during a unified manner, the profitable authorities should be suitable to give a network structure supporting colorful WSN operations and services that grease the operation of detector- equipped real- world realities. This paper presents an summary of profitable ecosystem, specialized armature, artificial device operation norms, and our rearmost exploration exertion in developing a WSN operation system. The crucial approach to enable effective and dependable operation of WSN within such an structure may be across-layer design of featherlight and pall- grounded RESTful Web service. (7)

LoRa in confluence with LoRaWAN protocol makes the LPWAN technology. LoRa which may be a personal modulation fashion using chirp spread diapason (CSS) makes the physical subcaste of the technology mound enabling the long- range communication link. LoRaWAN describes the medium access control (MAC) protocol in the data link subcaste (8).

Low power wide area (LPWA) networks are attracting tons of attention primarily due to their capability to supply affordable connectivity to the low- power bias distributed over veritably large geographical areas. In realizing the vision of the web of Effects, LPWA technologies complement and occasionally relieve the traditional cellular and short range wireless technologies in performance for colorful arising smart megacity and machine-to- machine operations. This review paper presents the planning pretensions and thus the ways, which different LPWA technologies exploit to supply wide- area content to low- power bias at the expenditure of low data rates. We survey several arising LPWA technologies and thus the standardization conditioning administered by different norms development associations (e.g., IEEE, IETF, 3GPP, ETSI) also because the artificial colleges erected around individual LPWA technologies (e.g., LoRa Alliance, Weightless-SIG, and Dash7 alliance).

We further note that LPWA technologies borrow analogous approaches, therefore participating analogous limitations and challenges. This paper expands on these exploration challenges and identifies implicit directions to deal with them. While the personal LPWA technologies are formerly hitting the request with large civil roll-outs, this paper encourages a lively engagement of the exploration community in working problems which will shape the connectivity of knockouts of billions of bias in the coming decade. (8)

The data link subcaste detects the changes within the physical subcaste and establishes a communication protocol to shoot data during a secure and dependable manner. The attributes of LoRaWAN includes transfer rate of 300bps to 50kbps, low power and low duty cycle, this makes LoRaWAN best suited for IoT operations (9).

The operating frequency of LoRa in India is 433 MHz. The data from the detectors are transmitted to the gateway using LoRa module. It provides long- range content of about 8 kilometers in metropolitan areas and up to three kilometers in thick civic areas and up to 30 kilometers home in line of sight measures (5).

The LoRa receiver shows the entered signal strength index (RSSI) in dBm during detector data packet event. RSSI indicates the entered signal power after the transmission losses. RSSI is expressed in negative figures; the quantum on the point of zero indicates a far better signal (10).

III. Proposed System And Conclusions

The main ideal of the proposed system is to develop an real time man- hole monitoring system that performs real- time monitoring and the data collected from different detectors in the bumps, are transferred to the gateway by wireless communication protocol. The gateway then's ESP32 Wi-Fi module. The gateway also transmits the detector data packets to the IoT cloud server over internet protocol and we can cover the detector values in pall, in internet enabled bias.

The design aims to develop a smart system to cover the real man- hole monitoring as a standard practice by government agencies. The system which we're developing will be suitable to successfully descry colorful detector situations hence streamlining in IoT platform. Overall, the system offers fast and easy monitoring of manhole in icing safety.

REFERENCES

[1] Ahmed Khalid, "Smart applications for smart live", IJCSMC, Vol. 5, Issue. 10, pg.97 – 103, October 2016
[2] Pallavi Sethi and Smruti R. Sarangi, IIT Delhi, "Internet of Things: architectures, protocols, and applications", Journal of Electrical and Computer Engineering, Article ID 9324035, 25 pages, 2017
[3] Jun Zheng, Southeast University, China, Abbas Jamalipour, University of Sydney, Australia, " Introduction to wireless sensor networks ", IEEE 2009
[4] Augustine Ikpehai, Bamidele Adebisi, Khaled M. Rabie, Kelvin Anoh, Ruth E. Ande, Mohammad Hammoudeh, and Uche M. Mbanaso, Members IEEE, "Low-Power wide area network
[5] Ashraf A. Taha, Mohamed F. Feteiha and Wadood Abdul, "Performance evaluation for LoRa transceiver ", International Journal of Computer Science and Software Engineering (IJCSSE), Volume 8, Issue 2, February 2019
[6] A. P. U. Siahaan, nogar silitonga, muhammad iqbal, solly aryza, wirda fitriani, Zuhri ramadhan, rahmad hidayat, h, " Arduino Uno-based water turbidity meter using LDR and LED sensors ", International Journal of Engineering & Technology, 2018
[7] zhengguo sheng, chinmaya mahapatra, chunsheng zh, and victor c. m. leung, members ieee, "Recent advances in industrial wireless sensor networks toward efficient management in IoT" ,vol 3, ieee access vol 3, 2015, doi: 10.1109/access.2015.2435000
[8] Usman Raza, Parag Kulkarni, and Mahesh Sooriyabandara, "Low power wide area networks: an overview", ieee communications surveys & tutorials, volume: 19 , issue: 2, jan 2017
[9] Alexandru Lavric, Valentin Popa, "Internet of things and LoRa lowpower widearea networks challenges", ieee 2017 9th international conference on electronics, computers and artificial intelligence (ecai)
[10] Faheem Zafari, Athanasios Gkelias, Kin K. Leung, ieee members, "A survey of indoor localization systems and technologies", arxiv:1709.01015v3 [cs.ni] 16 jan 2019