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SMART MANHOLE DETECTION

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Abstract: Communication through web is turning out to be a smart city is that the long term goal to possess cleaner and better amenities for the society. Smart underground infrastructure is additionally an infinite feature to be considered while implementing a wise city. system monitoring plays an unlimited role to remain town clean and healthy. Since manual monitoring is incompetent, this finally finally winds up in slow handling of problems in drainage and consumes longer to resolve. To mitigate of these issues, the system employing a wireless sensor network, consisting of sensor nodes is meant. The proposed system is low cost, low maintenance, IOT based real time which alerts the managing station through message when any manhole crosses its threshold values. this method reduces the death risk of manual scavengers who clean the underground drainage and also benefits the final public.

Keywords: Drainage monitoring system, IOT, Monitoring smart city, Infrastructure, Scavengers.

I. INTRODUCTION

An integral a component of any system is that the access points into it when it involves cleaning, clearing, and inspection. Metropolitan cities have adopted underground system and so the city's municipal corporation must maintain its cleanliness. If the drainage outlet management is not at its best, H₂O gets dirty and lead to infecting diseases. Blockages in drains during monsoon season, causes problems within the routine of the final public. Hence, there should be a facility within the city's corporation, which alerts the officials about blockages in sewers, their exact location. It mainly acknowledges within the sector of alerting the people about the gas explosion, increase within the water level and so the temperature level. It uses IOT to make the drainage monitoring system in an exceedingly highly automotive by using sensor for detecting and sending alerts through GSM and GPS module to the authorities. This project overcomes the demerits by detecting drainage water blockage by installing water rate of flow sensors at the intersection of nodes. When there is a blockage in an exceedingly particular node, there's variation within the flow of drainage water which when cross the set value will display the alert within the managing station. Also other demerits are solved by detecting temperature variations inside the manhole and alerting the similar to the

managing station. Also, rate of flow sensors are used to detect the over flow of the drainage water and alerting the a dead ringer for the managing station through automatic message. Maintenance of manholes manually is tedious and dangerous because of the poor environmental conditions inside so, the foremost focus of this project is to produce a system which monitors water level, atmospheric temperature, water flow and toxic evolved gas. If drainage gets blocked and sewage water overflows, it's sensed by the sensors and message is distributed to the municipal. It is, therefore dangerous to travel inside the manholes for inspection of its current state. to resolve all the problems related to underground sanitation, a distant alarm system is vital for transmitting data collected by the sensors set inside the manhole to the managing station. This includes components like controller, memory, transceiver and battery to supply power.

II. RELATED WORK

An integral part of any drainage system is the access points into it when it comes to cleaning, clearing, and inspection. Metropolitan cities have adopted underground drainage system and the city's municipal corporation must maintain its cleanliness. If the sewage maintenance is not proper, ground water gets contaminated causing infectious diseases. Blockages in drains during monsoon season, causes problems in the routine of the public. Hence, there should be a facility in the city's corporation, which alerts the officials about blockages in sewers, their exact location. It mainly acknowledges in the field of alerting the people about the gas explosion, increase in the water level and the temperature level. It uses IoT to make the drainage monitoring system in a highly automotive by using sensor for detecting and sending alerts through GSM and GPS module to the authorities. This project overcomes the demerits by detecting drainage water blockage by installing water flow rate sensors at the intersection of nodes. When there is a blockage in a particular node, there is variation in the flow of drainage water which when cross the set value will display the alert in the managing station. Also other demerits are solved by detecting temperature variations inside the manhole and alerting the same to the managing station. Also, flow rate sensors are used to detect the over flow of the drainage water and alerting the same to the managing station through automatic message. Maintenance of manholes manually is tedious and dangerous due to the



poor environmental conditions inside so, the main focus of this project is to provide a system which monitors water level, atmospheric temperature, water flow and toxic gases. If drainage gets blocked and sewage water overflows, it is sensed by the sensors and message is sent to the municipal.

III. METHODOLOGY

1. Romer, K. Mattern:

The design space of wireless sensor networks, Wireless Communications Author: Romer K. Mattern Description: within the recent past, wireless sensor networks have found their way into an outsized kind of applications and systems with vastly varying requirements and characteristics. As a consequence, it's becoming increasingly difficult to debate typical requirements regarding hardware issues and software support. this will be particularly problematic in an exceedingly multidisciplinary research area like wireless sensor networks, where close collaboration between users, application domain experts, hardware designers, and software developers is required to implement efficient systems. during this paper we discuss the results of this fact with relevance the planning space of wireless sensor networks by considering its various dimensions. We justify our view by demonstrating that specific existing applications occupy different points within the planning space.

2. Author: Kelly S.D.T, Suryadevara, N.K, Mukhopadhyay:

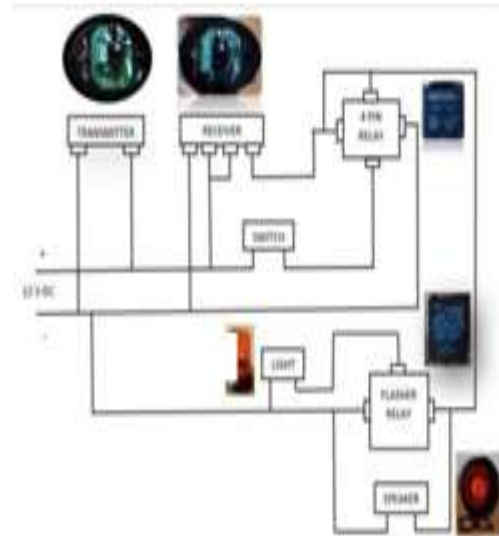
Towards the Implementation of IOT for status Monitoring in Homes Author: Kelly S.D.T, Suryadevara, N.K, Mukhopadhyay S.C Description: during this paper, we've reported an efficient implementation for Internet of Things used for checking day to day issues by the help of low rate advanced sensing system. the outline about the integrated spec and therefore the interconnecting mechanisms for reliable measurement of parameters by smart sensors and transmission of information via internet is being presented. The longitudinal learning system was able to provide self-based functioning for better operations of the devices in monitoring stage. The framework of the monitoring system is predicated on combination of pervasive distributed sensing units, data system for data aggregation, reasoning and context awareness. Results are encouraging because the reliability of sensing information transmission through the proposed integrated spec is 97%. The prototype was tested to get real-time graphical information instead of a work scenario

IV. MODELING AND ANALYSIS

i. Projects schematic diagram:

A schematic, or schematic diagram, is a presentation of the elements of a system using abstract, graphic symbols rather than real time pictures. A schematic usually erases all

details that are not relevant to the information the schematic is intended to convey, and may add unrealistic elements that aid comprehension.



V. CONCLUSION

Underground monitoring is challenging problem. This project proposes different methods for monitoring and managing underground system. It explains different applications like underground drainage detection and manhole identification in day to day life. Various parameters like temperature, toxic gases, flow and level of water are being monitored and updated on the net using the online of Things. this enables the person in-charge to need the mandatory actions regarding the identical. during this manner the unnecessary trips on the manholes are saved and will only be conducted as and when required. Also, real time update on the online helps in maintaining the regularity in drainage check thus avoids the hazards.

VI. REFERENCES

- [1]. S Sultana, A Rahaman, Am Jhara, Ac Paul "An IOT Based Smart Drain Monitoring System With Alert Messages"-Conference On Intelligent, 2020 Springer.
- [2]. A Pendharkar, J Chillapalli, K Dhakate, "IoT Based Sewage Monitoring System", Available At SSRN, 2020, Researchgate.Net.
- [3]. U Andrijašević, J Kocić, V Nešić, "Lid Opening Detection in Manholes" 2020- Ieeeexplore.Ieee.Org.
- [4]. P Bhosale "IoT Based System For Detection Of Sewage Blockages", 2021, it-in-industry.org.
- [5]. M Aarthi, A Bhuvaneshwar, "IoT Based Drainage and Waste Management Monitoring Alert System For Smart City "Annals of the Romanian Society, 2021-annalsof rscb.ro.



- [6]. Prof S. A. Shaikh¹, Suvarna A. Sonawane²,
“Monitoring Smart City Application using Raspberry
PI Based on IOT” International Journal of Innovative
Science, Engineering & Technology, VOL 5 Issue
VIL, July 2017.
- [7]. Prof Mangesh Sk¹, Santosh Rao², “Automated
Internet Things For Underground Drainage And
Manhole Monitoring System For smart Cities”
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