

Survey on Enhancing Drainage Maintenance System Using IOT

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Abstract--- World has declared task making of many savvy urban communities. To develop a shrewd society one have to look at numerous measurable factors, for example, brilliant water, savvy power, keen transportation and so on. There is a scope of savvy system which incorporates lower-level water pipe connections, correspondence links, gas connections, electric stream, and so forth. As the greater part of the urban areas in India have embraced lower level drainage system, it was imperative that this mechanism should perform in a legitimate way to make the society spotless, protected and sound. On the off chance that they neglect to keep up the scrap unadulterated water may transform to polluted with drainage water. It also spread irresistible infections. So unique sort of idea has been done to identify, keep up and deal with these lower-level systems. Additionally, breaks and blasts are unpreventable parts of water conveyance system the executives. It can represent noteworthy water misfortune inside a dispersion arrange whenever left un notified for significant lot. The drainage system is the activity of depleting waste water and sticky fluid segments towards the waterways utilizing specific examples, drainage channels and streams. Drainage system essentially alludes to all the funneling inside the private and open premises which passes on sewage, water and other fluid waste to a point of transfer. The associated gadgets will make the waste system increasingly agreeable to work, screen, control with less assets and to take important activities. Over stream of sewage on streets is been a noteworthy issue in many created and immature urban communities also. Sewage is commonly considered as waste water. The reaction to the protests isn't appropriately replied or considered. A prudent system is created where this issue of sewage flood can be diminished by early detecting of increment in its dimension. The system rather essentially studies and checking the dimension, issue articulation and solution about the drainagesystem.

Keywords--- Drainage Maintenance System, IOT, Enhancing Smart City.

I. INTRODUCTION

Expanded urbanization has caused issues with expanded glimmer overwhelmed after sudden downpour. The thought behind shrewd drainage system is to recreate common systems that utilization savvy Solutions with low ecological effect to deplete away messy waste water previously enabling it to again into the earth. This is to counter the customary drainage system that is regularly took into consideration flooding and contamination of condition. Every fruitful human progress since the commencement concentrated on creating effective drainage system, redirecting both waste water far from drinking water and downpour water towards harvests in rural use. The principle changes come into materials and innovations utilized in

waste system checking from past antiquated territories to introduce day.

Where once waste channels are created from mud, lead, wood, stone or even from bamboo, presently they are built from strong materials, PVC, copper, metal and so on. Again after examination and acknowledgment fixing within drainage channels with smooth materials would help the stream of waste water, and many channel freedom organizations today spend significant time in upkeep and support of these channels to guarantee that these channels will remain in a decent working request. Ordinary upkeep of waste system will guarantee that it capacities appropriately consistently. It ought to be guaranteed that the outlet trench of the subsurface systems are free from blockages brought about by residue development and the flotsam and jetsam does not seal the delta covers. Waste issues can make critical harm home, property, and the City of Shoreline storm channel system. The present waste system isn't modernized. So at whatever point there is blockage it is hard to make sense of the definite area of the blockage. Additionally, we don't get early alarms of the blockage. Consequently discovery and fixing of the blockage turn out to be so tedious. It ends up being severely orchestrated to manage the situation when channels are blocked absolutely due to such frustration of waste line people face a huge amount of issues. It is basic to recognize and address squander issues when they occur. If a tile of the seepage framework breaks, it must be displaced, else, it can corrupt gatherings of fresh water. An examination coordinated by the University of Illinois has shown waste frameworks can similarly add to corrupting issues, especially when a stop up occurs and is left unnoticed. The sewage outlet framework watching has been a troublesome and repetitive assignment. A stop up in the sewage pipe will provoke flood and stagnation of sewer water along the avenues. The common issues and illnesses that develop to sewage stagnation are terrible. The erratic upkeep of sewage outlet framework has caused tremendous catastrophes in the state declaring various human lives. Most of the urban networks got the underground waste framework and it is the commitment of Municipal Corporation to take care of tidiness, strong and security of urban regions. In case the waste framework isn't properly managed, by then unadulterated water gets spoil with seepage water and overpowering sicknesses may get spread. The waste gets discouraged in the midst of swirling season and it will make the issues to routine life like traffic may stall out, condition will finish up dirty and completely it will aggravates the all inclusive community.

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All things considered blocked channels can make sewage and waste water back up and perhaps come up onto your property. Accept if there is an office that specialists or concerned individuals come to know rapidly the blockage or halting up inside the squander coordinates in which zone and exact spot where it gets blocked. So our guideline focus is to screen the sewer vents using sensors. In case squander gets blocked or water floods, the sensor recognizes the activity and sends the information through transmitter to the stress individuals. Sewer vent upkeep by human is troublesome in light of the way that condition is uncommonly poor and it is difficult to go inside sewer vent for inspecting the states of sewer vents always. Immediately it is crazy to hope to attest if the individual interferes with the sewer vent or a disaster happens inside the sewer vent. The seepage framework is essential for the all inclusive community who live in urban zones as this framework diminishes flood sway by means of occupying water (an office to orchestrate liquid waste). Improper upkeep of existing waste framework leaving various people persevere.

The genuine domains influencing in various urban areas because of imperfect, improper waste checking framework are lanes. Avenues are created to support human and vehicular traffic. Starting at now urbanization has negative impact on waste framework in various urban territories and towns over the globe. Irregular checking of seepage framework prompts contamination of water and prompts water borne diseases. Stagnation of water on roads will makes boulevards hurt. Even more fundamentally flooding of avenues lead to streets turned parking areas and causes loss of gainful human hours, loss of pay and work. Ground water spoiling is similarly possible, if once it is degraded it's difficult to clean up. A better than average and beneficial seepage framework is gravely required for the making countries like India. Underway of many astute urban territories the plan of waste framework accept a basic occupation. To keep up a better than average and suitable waste framework it takes continuously human resource. Regardless of the way that putting focuses of rupees in waste division when it rains the circumstance will be the proportionate. To vanquish all of these issues we need a remote watching the states of waste inside seepage channels. Keen waste framework can add to sensible headway and improve the spots and spaces where we live, work and play by altering the various possibilities and troubles that sway the urban arrangement and improvement of systems. The present existing waste framework needs to consolidate with development to get out the issues us facing.

II. RELATED WORK

Prof. S A. Shaikh et al[1] the Smart city is the progression target to screen the idea of benefit in the city to improve extraordinary organization and snappier headway of the city required need is to refresh sound and safe urban zones that passing on steady organizations and latest office to execute clever city use IoT thought by which straightforward remote correspondence is possible. The framework include sensors, assemble particular sorts of data from sensors and trade to the Raspberry Pi3 controller. The got yield from the controller is sent to the control room through the E-mail and moreover appear on the PC.

Muragesh S. K et al[2] The Internet of Things (IoT) comprises of genuine items, specialized gadgets joined to sensor arranges so as to give correspondence and robotized activities between genuine world and data world IoT showed up in light of the fact that, without human affiliation, PCs could get to data from things and devices, anyway it was away for, to overcome the limiting factors of human entered data, and to achieve cost, precision and clearing articulation factors. Sensor Network is a key enabling impact for IoT perspective. It addresses the execution and design limit of an Underground Drainage and Manhole Monitoring System (UDMS) for IoT applications. The basic considerations of this arrangement are insignificant exertion, low help, brisk association, and a high number of sensors, long life-time and high gauge of organization. The proposed model gives a framework to watching the water level and ecological temperature and weight inside a sewer vent and to check whether a sewer vent spread is open. It similarly screens underground presented electric electrical links. Dynamically, UDMS can remotely screen current states of the sewer vents.

Chandraleka.T et al[3] executed the setup in a flood inclined zone. The Arduino driven Automated System will be introduced in the low laying zones where the water gets stopped up. The IR Sensor (HC-SR04) will recognize the profundity of the water. On the off chance that the water surpasses the Safe tallness, the system will trigger the siphon associated with it and drive the water to another way. The profundity of water will be always shown on the LCD with the goal that it is held under consistent watchfulness by the bosses. Additionally the activating caution would be demonstrated by an alarm and the flashing LED light. The Arduino UNO and its sub parts are customized in C++ utilizing Arduino IDE. The different libraries required for the system working is called to the program and the strategies are executed according to the necessities. The mechanized system can be fixed anyplace, where the water checking is required, regardless of the sort of liquid included. The program once sustained in the system makes it keep running without programming bolster which makes it good. The target of the system is to maintain a strategic distance from water flood so as to keep the apparatuses from getting affected.

Gaurang Sonawane et al[4] Drainage system checking assumes a vital job to keep city clean. Truth be told, not all territories have drainage observing group. It prompts sporadic checking of the waste condition. The unpredictable observing prompts the hindering of the drainage that suggest to the greeting which trigger flood. Manual checking is likewise awkward. It requires an experts however they can just screen limited and keep up low exactness. Likewise once in a while because of absence of information the specialist may meets to a mishap as they have no clue that by what means will be the conditions in those sewer vent. This paper speaks to the application and configuration capacity of a brilliant and ongoing Waste and Manhole Monitoring System with the help of Internet of Things.



The sewer vents present in the sewage will have a module which is having microcontroller interfaced with gas sensor, level marker, NRF. The framework will screen if the blockage is occurred amidst two sewer vents and moreover it will identify the rising in proportion of various gases which are frightful to the general population, and besides a course of action of checking the water level then it will trigger an alert and will give those information to the prosperity divisions from which the particular move will be made. The system will ready to screen every one of these things progressively situation which will enable us to take legitimate activities of the specific issue in drainage system.

Shruthi Shri A. S. [5] clarified about The Sewage Outlet System checking has been a troublesome and dreary endeavor. A stop up in the sewage pipe will incite flood and stagnation of sewer water along the roads. The biological issues and disorders that develop to sewage stagnation are stunning. The flighty upkeep of sewage Outlet System has caused enormous catastrophes in the state affirming various human lives. The errand proposes a novel framework to screen sewage outlet channels. The block in the pipe will be sent to the remote server by strategies for IOT. Another good position of the endeavor is that stops up in seepage pipes can be recognized when it is molded rather than remembering it after the sewage water starts flooding into the roads making certified trouble the all-inclusive community and pay disaster to the organization. The system, what's more, does not require any human work to identify the stop up. In this manner the obstructs can be recognized effectively with no human impedance. In this way, an assortment of sensors and stop up recognizing modules are put in different positions along the drainage organize and the information is gathered utilizing IOT. In this manner the undertaking will give an effective methods for checking the waste or sewage outlet system giving a route to the more astute sewer system and identifying the obstruct development at its very presence, and keeps up a perfect domain, maintaining a strategic distance from fatal infectious ailments helping the whole human race lead a sound serene life.

GaurangSonawane et al[6] Drainage system observing assumes an imperative job to keep city clean. Truth be told, not all territories have waste checking group. It prompts sporadic checking of the drainage condition. The sporadic observing prompts the hindering of the drainage that suggest to the greeting which trigger flood. Manual observing is additionally awkward. It requires an experts yet they can just screen limited and keep up low exactness. Likewise some of the time because of absence of information the laborer may meets to a mishap as they have no clue that by what method will be the conditions in those sewer vent. This paper addresses the application and design limit of a splendid and steady Drainage and Manhole Monitoring System with the help of Internet of Things. The sewer vents present in the seepage will have a module which is having microcontroller interfaced with gas sensor, level pointer, NRF. The framework will screen if the blockage is occurred amidst two sewer vents and besides it will recognize the climb in proportion of various gases which are harmful to the general population, and moreover a game plan of checking the water level then it will trigger a caution and

will give those information to the prosperity workplaces from which the particular move will be made. The system will ready to screen every one of these things progressively situation which will enable us to take legitimate activities of the specific issue in waste system.

III. PROBLEM STATEMENT

Evacuating stormwater and family unit wastewater (some of the time called "sullage") is a critical ecological wellbeing mediation for lessening malady. Inadequately depleted stormwater frames dormant pools that give reproducing locales to sickness vectors. Along these lines, a few illnesses are more typical in the wet season than the dry season. Family wastewater may likewise contain pathogens that can dirty groundwater sources, expanding the danger of sicknesses, for example, lymphatic filariasis. Poor waste can prompt flooding, bringing about property misfortune, and individuals may even be compelled to move to escape floodwaters. Flooding may likewise harm water supply foundation and taint local water sources.

IV. METHODS FOR IMPROVING DRAINAGE

Structuring and building waste systems require master guidance from specialists to ensure that water streams away rapidly and easily and is discarded in a surface conduit or soakaway. Waste introduced by one network ought not make issues for different networks downstream, nor should it influence naturally imperative locales. Natural contemplations ought to be given satisfactory consideration: long haul changes to the earth may prompt more prominent medical issues later on.

4.1 Storm water Channels

The point by point plan of stormwater channels ought to be completed by specialists and consider climatic and hydrological information. These information might be rare, or may not cover the network where work is to be done. In such cases, the network can help by depicting where significant flood issues happen in the town and giving data about past floods. Stormwater channels ought to be intended to gather water from all pieces of the network and lead it to a primary channel, which at that point releases into a neighborhood waterway. The span of the channels ought to be determined by the measure of water they would be relied upon to convey in a tempest. Progressively outrageous floods happen generally rarely; to give a wellbeing edge, the most extreme stream of water is typically determined based on floods expected to happen once every at least 10 years. On the off chance that channels are intended to convey just the measure of water anticipated from a yearly flood, they won't almost certainly adapt to the stream of water from heavier floods, which may happen as frequently as each 2–3 years. This may exacerbate flooding issues and increment the wellbeing dangers. Stormwater channels are best built utilizing a solid covering. Earth channels are bound to wind up stopped up and congested, and cause issues with stormwater stream amid minor floods.

This can prompt the arrangement of dormant pools and bring about rearing locales for ailment vectors, for example, mosquitoes, expanding the danger of jungle fever, and snails, expanding the danger of schistosomiasis. The channels should likewise be appropriately kept up and cleaned: usually to locate that new depletes move toward becoming dumps for strong waste or even sewage in light of deficient upkeep. The people group ought to consequently set up how frequently depletes are to be cleaned and will's identity in charge of the upkeep. Frequently, the best arrangement is for network individuals themselves to assume liability.

4.2 Sullage Disposal Methods

Each family unit creates sullage. For example, it has been assessed that every individual produces 15– 20 liters for every day when gathering water from a standpipe. Sullage might be discarded either at home, utilizing nearby strategies, or through the waste system. At the point when sullage is discarded at home a soakaway pit can be built. On the other hand, sullage can be utilized to water little gardens, subsequently improving the harvest yield and sustenance, and this ought to be advanced if conceivable. Be that as it may, sullage can be reused along these lines just in the event that it contains practically zero cleanser, which may harm crops. In the event that a soakaway is utilized, the pit ought to be found far from the house and far from water sources. In a perfect world, there ought to be at least 30 meters between the soakaway pit and the closest water source, yet this separation may should be expanded if houses are tough of water sources. It isn't suggested that sullage be discarded in pit restrooms, since this may meddle with the breakdown of excreta inside the pit, and may over-burden lavatory soakaways where pour– flush toilets are utilized. At the point when the family unit is associated with a type of sewerage, sullage can be arranged off in the can or restroom. To be sure, for some sewerage systems, (for example, shallow sewerage or regular sewerage) transfer of sullage along these lines guarantees better working of the system.

4.3 Combined Drains

Joined channels are intended to convey both stormwater and sullage. Except if a joined channel is all around structured and kept up, in any case, sullage will pool inside the channel and structure creepy crawly reproducing destinations. These issues can be overwhelmed by utilizing a system with a little addition channel that conveys the sullage into a bigger channel for conveying stormwater. Similarly as with all waste systems, it is basic that the channels are legitimately worked and kept up, and that deny is cleared from the channels.

4.4 Buried Drains and Combined Sewers

Channels may likewise be joined into sewerage systems and be covered. This is progressively suitable for urban regions, however can be considered in rustic regions if the town streets are cleared and if flood streams are critical. Covered channels have gulf chambers at ordinary interims, as a rule along roadsides, that permit the passage of stormwater. The channels at that point lead straightforwardly either to a waterway or to a sewage-treatment works. At the point when channels stream

straightforwardly into sewage treatment works, care must be taken not to over-burden the works. The stormwater ought to dependably stream either into an adjustment lake, or into a capacity pool built to take stormwater streams over a specific volume.

V. SYSTEM SPECIFICATIONS

5.1 ARM 7

ARM7 is extensively used processor family in introduced framework applications. It is made by Philips and it is pre-stacked with various inbuilt peripherals making it dynamically capable and a strong option for the students similarly as an awesome application originator.

5.2 LM35 (Temperature Sensor)

The LM35 plan are an exactness consolidated circuit temperature sensor, whose yield voltage is straightly comparing to the Celsius (Centigrade) temperature. The LM35 as such has inclination over straight temperature sensors adjusted in ° Kelvin, as the customer isn't required to subtract an immense predictable voltage from its respect get accommodating Centigrade-scaling.

5.3 LCD (Liquid Crystal Display)

LCD speaks to Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven part LEDs or other multi area LEDs) because of the going with reasons: 1. The declining expenses of LCDs. 2. The ability to indicate numbers, characters and plans. This is rather than LEDs, which are obliged to numbers and two or three characters.

5.4 CO2 Sensor

This is a simple to-use Carbon Monoxide (CO) sensor, suitable for recognizing CO obsessions observable all around. The MQ-7 can perceive COgas obsessions some place in the scope of 20 to 2000ppm. This sensor has a high affectability and fast response time. The sensor's yield is a basic obstacle. It has extraordinary affectability to carbon monoxide in a wide range and has great conditions, for instance, long future, insignificant exertion, and direct drive circuit &etc.

5.5 LEVEL Sensor

Level sensors perceive the element of liquids and distinctive fluids and fluidized solids, including slurries, granular materials, and powder that show an upper free surface. Substances that stream end up being fundamentally level in their compartments (or other physical limits) because of gravity while most mass solids stack at a point rest to a zenith.

5.6 GPS

The Global Positioning System (GPS) is a space-based course framework that gives region and time information in each atmosphere condition, wherever on or near the Earth where there is an unrestricted perceptible pathway to somewhere around four GPS satellites.



The framework gives fundamental abilities to military, normal, and business customers around the world. The United States government made the framework, takes care of it, and makes it energetically open to anyone with a GPS recipient.

5.7 FLOW Sensor/METER

Water stream sensor involves a plastic valve body, a water rotor, and a passage sway sensor. Exactly when water travels through the rotor, rotor rolls. Its speed changes with a substitute rate of stream. The entryway sway sensor yields the relating beat banner. This one is proper to recognize stream in water contraption or coffee machine.

5.8 Microcontroller PIC18F4550

PIC (normally clarified as "pick") is a social event of microcontrollers made by Microchip Technology, got from the PIC1650, at first made by General Instrument's Microelectronics Division. Early models of PIC had examined just memory (ROM) or field-programmable EPROM for program storing up, some with course of action for deleting memory. Every single present model use streak memory for program putting away, and more cutting edge models enable the PIC to change itself. Program memory and information memory are detached. Information memory is 8-bit, 16-bit, and, in most recent models, 32-bit wide. Program rules change in bit-check by social event of PIC, and might be 12, 14, 16, or 24 bits in length. The course set additionally moves by model, with much all the more common chips including rules for modernized flag dealing with cutoff points. The equipment limits of PIC gadgets go from 6-stick SMD, 8-stick DIP chips up to 144-stick SMD chips, with discrete I/O pins, ADC and DAC modules, and correspondences ports, for example, UART, I2C, CAN, and even USB. Low-power and speedy collections exist for a couple of sorts.

5.9 Float Sensor

A float sensor is a contraption used to distinguish the element of liquid inside a tank. The switch may be used in a siphon, a marker, a caution, or diverse devices. Float changes stretch out from little to considerable and may be as direct as a mercury switch inside a turned float or as confusing as a movement of optical or conductance sensors making discrete yields as the liquid accomplishes a wide scope of levels inside the tank.

5.11 Water Flow Sensor

Water stream sensor contains a plastic valve body, a water rotor, and an entry influence sensor. Precisely when water courses through the rotor, rotor rolls. Its speed changes with a substitute rate of stream. The lobby influence sensor yields the relating beat flag. This one is reasonable to see stream in water contraption or espresso machine.

5.12 GSM

SIM900 GSM Module is the module that underpins correspondence in 900MHz band. We are from India and the greater part of the reduced framework suppliers in this nation work in the 900 MHz band. In the event that you are from another nation, you need to check the helpful framework band in your general district. A bigger bit of

United States minimal frameworks work in 850 MHz social affairs (the band is either 850 MHz or 1900 MHz). Canada works in a general sense in 1900 MHz band.

VI. CONCLUSION

This study handles the issue of drainage observing and presents the current advances to conquer the issue and give the solution for improving the system. Underground observing is testing issue, Many urban communities over the world are confronting waste system issues. Substantial Rain falls causing harmed streets and loss of profitable human hours influencing in one or different ways the nation economy. There is a worry circumstance coming to scene every now and again nowadays. The present existing innovations for drainage systems are Smart channel and CCTV channel reviews and so on. These days, the general population is confronting a great deal of issues amid overwhelming downpours and floods, due to not having affirmation on the deplete system. Region specialists are not accessible more often than not to clear the rubbish for example.

By setting sensors in the channels we can get the information about the issue once it achieves the penultimate dimension. Along these lines, at whatever point there was a sudden ascent of water to the penultimate dimension there is a sure move to be made by the district at that particular hub. An alert or message pop-up will be sent to the relating division head.

At that point he will direction the separate laborer to bargain the circumstance at the earliest opportunity. This paper speaks to the application and configuration capacity of an improved Waste and Manhole Monitoring System with the help of Internet of Things. The sewer vents present in the waste will have a module which is having microcontroller interfaced with gas sensor, level pointer, NRF. The framework will screen if the blockage is occurred amidst two sewer vents and moreover it will distinguish the rising in proportion of various gases which are damaging to the people, and besides a course of action of watching the water level then it will trigger an alert and will give those information to the prosperity divisions from which the particular move will be made. The system will ready to screen every one of these things continuously situation which will enable us to take appropriate activities of the specific issue in waste system.

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