

SMART SEWAGE MANAGEMENT SYSTEM

M.Suba Pradha¹, A.Balaji², M. Deepak³, M.E.Mohamed Fahees⁴,

¹ Assistant Professor, ² Student, Department of Mechatronics Engineering,
M.A.M School of Engineering, Trichy.

cool.pradha@gmail.com, alagarbala1999@gmail.com, mpajaydeepak007@gmail.com, ahees770@gmail.com

ABSTRACT

In recent days the sewage management is the big problem in our country and it is cleaned by the manpower, due to that so many diseases are caused. In India sewage cleaning from manholes and drains are difficult and risky job for everyone, but those people/workers are forced to do all jobs to earn for their family. It is mainly used for metropolitan cities and highly populated areas. To develop this such a device which would monitor the health of the person/worker entering the sewage and provide the health parameters in real time to the officials outside or the control room. The Normal Sewage system are changed into useful water system. All the sewage pipe lines are interconnected and are discharged into water power plant. Sometimes impurities are stroked like block. This block will be released easily and used for recycling and also re-use the water for many useful ways like plantation, gardening etc.

Keywords: Sewages, parameters, pipelines, ditch holes, subway pipes.

1. INTRODUCTION

A large number of sanitation workers will die every year due to their erratic and lack of facilities which are available, and the harmful toxic gases will be released while cleaning the sewage. The Manholes will not designed for anyone to work in regular, but the workers may also need to enter inside their manhole to complete the jobs such as cleaning, repair, inspection etc. A better of knowledge related to hazards in their surroundings was necessary for their prevention of poison of gases. All These gases will have to be keep on the track so that enormous rise in their normal level of effluents which should be known and corrective measure can be taken. If the drainage system is not properly managed then pure water gets contaminate with drainage water and infectious diseases may get spread. It is fully automated process. This reduce the human effort and save the life of common People's after that Flow sensors are used to detect the blocks. This can easily controlled by microcontroller and send the SMS by using GSM Technology

2. LITERATURE SURVEY

Subash Guptaz et al [13] Sewage Management system, 2020 We use one water pump to pump the sewages into receiving chamber. Then from the sewages which are passed to the screening and grit chamber which will consists of net, where the plastics and solid wastes are blocked. After that, sewages are passed in to skimming tank in which oil and greases will be removed. After this, sewages are passed to primary sedimentation tank, here particles which are not settle down in receiving chamber are settled here. From there, sewages will passed into aeration tank where there is an air flow due to which air bubbles will be formed and biological organic matter are removed. After this, sewages are passed to secondary sedimentation tank where scums are removed. After that

it was passed in to filtration chamber where the gravels are present for the purification and after that sewage is passed into disinfection chamber where the micro organisms were removed by UV-rays, chlorination and after this it is finally somewhat can be used for drinkable purpose.

G. Sunitha, P. Sujatha, D. Lalitha Bhaskari et al [11] Today's drainage system is not high-tech. Whenever there was blockage it is difficult to figure out their exact location of blockage. Also, alerts the blockage which are not received immediately. Hence the detection and reconstruction of their blockage will become time-consuming. It also becomes a very difficult to handle their situation when the pipes were clogged completely. Due to their failure of drainage line people will face a lot of problems.

S. Ramanathan, R. Sudharshan, Karthik B, A. Mohammed Suhail, sewage cleaning machine, 2016 et al [12] In the earliest form of sewer cleaning machine which was hand excavation by labourers which loaded sediment into barrows were also moved down the sewer and then lifted out at the manholes by bucket. The work was not only dirty, which was unpleasant and dangerous. The major problem is manual scavenging in the health issues which is faced by the workers and more over the cleaning was done by the human beings because of their earning. Nowadays even though the automation which plays an important role in all the industrial applications, also the proper disposal of sewages from the industries and commercials will have a challenging task. Drainage cleaning system was proposed to overcome their real time problems. In the project their aim was to replace their manual work in the drainage which was cleaned by introducing a semi-automated system in an efficient way

to control their disposal of wastages and with their regular filtration of wastages. In that model, a pneumatic piston was connected by the wire rope which was in turn and is coupled with the kinematic of linkages. The linkage from their frame was to be submerged with the sewage. When the pneumatic piston was actuated, the grippers were provided at the bottom which is expanded and collected their solid wastes from the sewage. Ultimately their motto is to fabricate the machine which was cost effective as well as efficient in working.

3.IMPLEMENTATION

During rainy day, rainwater results in an overflow of combined sewage systems in poor wastewater management systems. Monitoring the inflow of water with the help of GSM Micro Control can help water utilities to detect overflows in real-time and take appropriate actions to reduce water wastage. For instance, their administrators which can control their valves and provide more water flow to their areas for a specific time interval to prevent the combined sewage overflow. Administrators can also automate the control of valves with the help of GSM technology .so that the valves adjust themselves according to the inflow of water and also, algorithms can help to predict the inflow of water and prevent the combined sewage overflow.

Regarding this, the placement of components on the frame, there are components such as Arduino ATMEGA, Flow Sensor 1, Flow Sensor 2, Vacuum Motor 3, LCD display, GSM Module, Water Motor, Power supply and other components. All of the components mentioned above are attached behind this foam axis, starting from the power supply which is provides electricity to the Arduino at mega and then connected to several components such as LCD display, Flow Sensors 1, Flow Sensors 2, Water Motor, GSM module, So that the function can run smoothly by using this order.

The process of connecting tools and applications that will be created. the tool and application Arduino IDE is an abbreviation of integrated development environment which is a software writing programs, compiling and uploading programs to the Arduino board. For basic applications using the Arduino IDE, the tools and materials used are: Computer, Arduino board, USB cable.

4.METHODOLOGY

In this section, the sewage management procedure is explained briefly. ATMEGA328P is a high performance, low power controller from Microchip. It is an 8-bit microcontroller based on AVR RISC architecture. It is one of the most popular of all their AVR controllers was used in the ARDUINO boards. ATMEGA328 is used similar to any other controller. All there to do is programming. Controller was simply execute their program which is provided by us at any of their instant. Without programming the controller it was simply stays and put without doing anything. As of said, first we have to program their controller and that was done by writing their appropriate program file in the ATMEGA328P

FLASH memory. After that dumping their program code, the controller will execute their code and provides the appropriate response.

A flow sensor (more commonly referred to as a "flow meter") was an electronic device that will measures or regulates their flow rate of liquids and gasses within the pipes and tubes. It was generally connected to the gauges to render their measurements, but it can also be connected to their computers and digital interfaces. It was commonly used in the HVAC systems, medical devices, chemical factories, and septic systems. Flow sensors were able to detect their leaks, blockages, pipe bursts, and changes in the liquid concentration due to their contamination or pollution.

Ultrasonic flow sensors was the most popular type of their non-contact flow sensor. This sensors will send their pulses of high frequency sound which was across the flowing liquid or gas medium. All these sensors will measure the time between their emission of sound and also it contact with their sensor's receiver to determine their flow rate of gas or liquid.

The display unit comprises of an OLED display, buttons, LED's and a vibration motor. It consists of 3 LED's. The green LED signals that all levels are below critical levels. The red LED signals if any parameter is above or below the critical level. The yellow LED signals when the emergency switch is pressed. The display set communicates with the sensor set via an UART communication [9]. The OLED display works in sunlight better than other available technologies.

A suction motor will creates vacuum pressure and suction by rotating a motor fan. The impeller rotates at an incredibly high speed of about 30,000 RPM. A suction motor's power is measured by multiplying the rate of air flow and the vacuum pressure, which induces air flow from the brush through the hose. Rating the motor for its ability to produce suction with air flow is one of the most misrepresented and misunderstood aspects of vacuum cleaner technology. This confusion have been accentuated by their many manufacturers in all the attempts to make their products which was appear in superior to others.

GSM is a mobile communication modem; it stands for global system for mobile communication (GSM). It was widely used by the mobile communication system in all the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operate at the particular frequency bands. Administrators can also automate the control of valves with the help of GSM technology. It will predict the inflow of water and prevent the combined sewage overflow.

The below diagram is the methodology of sewage management system is shown in Fig1.

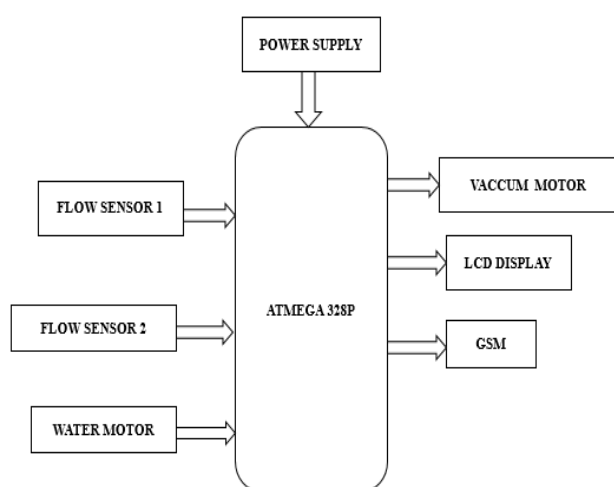


Fig 1 Block diagram of Methodology

5. RESULT AND ANALYSIS

This will result in an overflow of combined sewage systems in poor wastewater management systems. Monitoring the inflow of water with the help of GSM Micro Control can help water utilities to detect overflows in real-time and take appropriate actions to reduce water wastage. For instance, the administrators which can control all the valves and provide more water flow to their areas for a specific time interval to prevent their combined sewage overflow. Administrators can also automate the control of valves with the help of GSM technology so that the valves adjust themselves according to the inflow of water and also, algorithms can help to predict the inflow of water and prevent the combined sewage overflow.

6. CONCLUSION AND FUTURE SCOPE

A leak in the distribution pipes distributes the water regionally which can result in the heavy loss of water. Hence, these pipes need to be changed regularly according to the necessity. Micro Control collects data like type of sand that pipes rest on, topography, and weather records. And then AI can help to analyze these data to find patterns that offer clues to the water utilities about which pipes are at risk of leakage. GSM-enabled sensors and AI-driven analytics in smart wastewater systems are not the only technologies that can help water utilities to improve the management and treatment of wastewater across the facilities. Other technologies like big data analytics can help to improve the accuracy of insights into wastewater management processes and also improve their management. Governments of smart cities play a vital role in their collaboration of most of the technologies. It can take initiatives to educate all the citizens about their benefits of using all technologies for

their mainstream of adoption. Also, governments can plan and build the infrastructure for the implementation of systems created with the help of these technologies.

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