Introduction

Drainage conditions should be monitored in order to ensure its proper functioning. Not all areas have drainage proper monitoring teams which leads to irregular monitoring of the drainage condition that has a vast contribution on the clogging of the drainage that imply to the siltation which trigger flooding in the neighborhood. Manual monitoring is also ineffective. It needs a lot of dedicated persons who are only able to record limited report with low accuracy. These weaknesses lead to the slow handling for problems in drainage. To overcome such a complication an IoT based sewage level maintenance system is proposed, where the system uses a magnetic float sensor to detect and an Iot module to communicate [4]. The maximum and minimum set level for the underground drainage system is set and it is being monitored by a magnetic float level sensor. This level sensor keeps tracking the level of the sewage and passes information on regarding to the municipal department, to the corporation and other governing departments via MAILS or SMS. The complaints will be auto launched prior to the overflow as soon as the level reaches the maximum set. The complaints would me registered repeatedly by the mechanism until the level reaches the minimum set. The entire system is controlled using a ARDUINO micro controller.

We had the city sewage flood our house because of a plastic bag which blocked the city sewage pipes below our house.

2. LITERATURE SURVEY

A system of sewer pipes collectively called sewers, collects the sewage and takes it for further treatment or disposal. Properly functioning septic tanks require emptying every 2–5 years depending on the load of the system. An underground sewage system was designed where all the waste from the home and industrial waste water are collected together and driven together. Sewage overflow on roads is a major problem in cities, where large numbers of complaints are launched and no actions are being taken.

In many places sewer level detection is being carried to detect the level of the fluid in advance to overflow problems. In recent years Japan has often experienced unexpected intense rain due to the development of cumulonimbus clouds; these are frequently occurring torrential downpours. According to the Meteorological Agency, in 2014 short period heavy rainfall exceeding 50 millimeters per hour occurred 237 times (at 1,000 observation points). The long-term statistics from 1976 clearly shows this as an increasing trend [6]. Due to relentless downpours, sewer systems have overflowed and numerous instances of flood damage have been experienced mainly in cities [5]. Equipping manholes in sewer line infrastructures with sensors can measure water levels and accurately detect early signs of overflow. However, the operating cost for each sensor is expensive, making it difficult to install sensors across a wide area. For this reason the number of sensors installed needs to be minimized. However, the effective installation of sensors was largely dependent on intuition and experience of the workers and now "there are growing expectations on ICT” to achieve this.

3. PROPOSED METHOD

In the method proposed, development of IoT based sewage level maintenance is designed, where the sewage level is monitored using a magnetic float level sensor[7]. The minimum and maximum levels are set and the level sensor keeps on monitoring the level of the sewage. As the level reaches the maximum set point, the float level sensor detects and send the signal to the controller where the controller commands the IoT network to generate alert complaints to the municipal and corporation departments in prior to overflow [8][9]. The complaints will be repeatedly registered until the level reaches the minimum set. The communication is done based on IoT where the complaints are auto registered via mails or sms and the entire system is controlled using a ARDUINO microcontroller

3.1. Function Block Diagram

The function block diagram describes the monitoring of sewage level in the underground sewage system. The sewage being disposed form domestic and industrial sites are together passed on to a drainage system. During the cases of any blockage in the pipe lines or during the affect of storm water, level of the sewage increases. This continues increase in sewage level causes overflow which is to be controlled. This increase in level of sewage is monitored using a float switch (level sensor) [10]. The signal form the level sensor is fed to the micro controller where the controller commands the IoT module to alarm complaints via mails and sms. The controller is programmed such that the complaint alarms would be triggered repeatedly unless the level reaches the minimum set.

3.2. Block Diagram of IoT

Internet of things is a structure that which is used to interconnect computing devices, machines, objects, animals or peoples that are provided with unique identifiers and their capability to transmit data over a network without human– to-human interaction or even human –to– computer interaction [10]. The internet service is the fundamental system linked to the local user, router/hub and the cloud. The signal is transferred to the IoT module where the local user and the router interact and pass on the message to the early fed inputs

4. METHODOLOGY

The working of a float switch is to open or close the circuit as the level rises or goes down. Usually float switches are not “normally closed” condition, which means that two wires come from top of the switch complete the circuit when the float is atits lower level (i.e., resting at dry level). The sewage level monitoring system consists of various stages which include design of sensor, design of communication units, design of database and micro controller.

4.1. Sensor Details – Ultrasonic Sensor