

Smart Drainage and Health Monitoring System of Manual Scavenger Using IoT

PROF. S. S. SHINDE¹, AAKASH BALASAHEB KANGUDE², RUSHIKESH DATTATRAY NAGTILAK³

¹ Assistant Professor, SMSMPITR AKLUJ (MS)

^{2,3} B Tech Students, SMSMPITR AKLUJ (MS)

Abstract—In urban cities, drainage system has been built for maintaining a clean and sustainable environment. It is the sole responsibility of the municipal corporation to clean and maintain the underground drainage. If it is not maintained properly, the wastage will block the drainage pipelines. As a result, people are facing a lot of issues in the city. The workers have to go and clear the blockage in the drainage. If there is any leakage in the pipe, the harmful gases will come out due to excess wastage disposal. This leads to the introduction of various diseases in human being. To overcome the various problems, an IoT device is proposed. With the help of different sensors like ultrasonic sensors are used to check the level of wastage, a gas sensor is used to detect harmful gases, pulse sensor, heartbeat sensor, buzzer, fan, and Arduino. When it crosses the threshold value, the buzzer will be alerted and its data will be displayed on the IoT web page.

Index Terms—Introduction, Literature Survey, Objective and Block diagram

I. INTRODUCTION

As water supply and sewage infrastructure are built for the cities, it is required to maintain the drainage system. Drain conditions ought to be monitored to keep up its correct performance. Bad monitoring leads to blockage in the drainage, because of this it triggers flooding in the neighborhood. If the improvement action is taken on time-related to drainage block, which will become a serious problem in the daily lives of people living in urban areas and if the drainage block remains for a long period due to increased waste matter, then it will produce harmful gases, which will affect the human health. It is well known that, the management system of drainage is not digitized and so it is difficult to find out which drainage is blocked in a specific location. Due to the waste, harmful gases like methane, carbon monoxide, etc. are produced. This adversely affects the worker's health and they may also get new diseases. This Problem can be solved by using IoT Technology. By

using IoT technology, the data can be obtained from the sensors, which are connected to the Arduino that sends data through the cloud. In the past few years, survey says that the death rate of sanitation employees has increased due to unaware of harmful gases, which are present in the drainage because it is known that, gases are odourless, and it is important to respect them because they risk their lives for maintaining healthy cities and this can be overcome by using the IoT technology.

II. LITERATURE SURVEY

Jorge Gomez: developed a personal health diagnosis based on the symptoms of the patient. A huge amount of collected data is used to analyse the disease and risk of the patients.

Franca discussed that the innovations of the new generation systems are the development of continuous monitoring features for the patient and the improvement of workflows and productivity of medical personal.

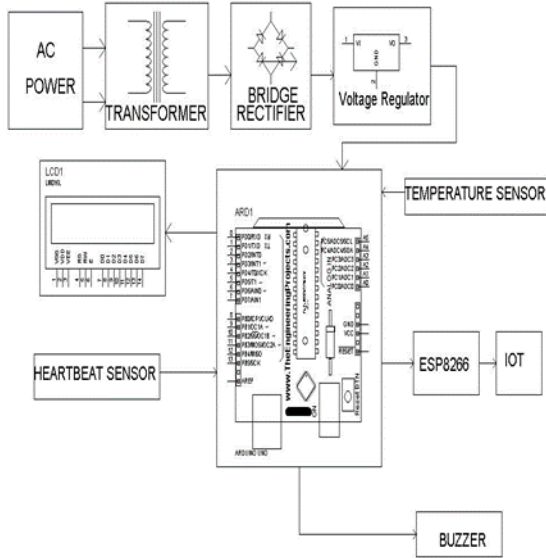
He also emphasized the various Sneha N. Malokar 1, Samahan D. Mali²: developed a wearable sensor system to monitor the movements of the patients.

The system was calibrated to a threshold level less than 5% with the aim of minimizing the error rate of the captured data proposed a detection system to monitor the movements of patients which recognizes a fall and automatically sends a request for help to the caretakers. s wireless technologies and the advantages of using those technologies

III. OBJECTIVE

The objective of our study was to assess PHR data types and functionalities through a review of the literature to inform the health care informatics community, and to provide recommendations for PHR design, research, and practice.

IV. METHODOLOGY



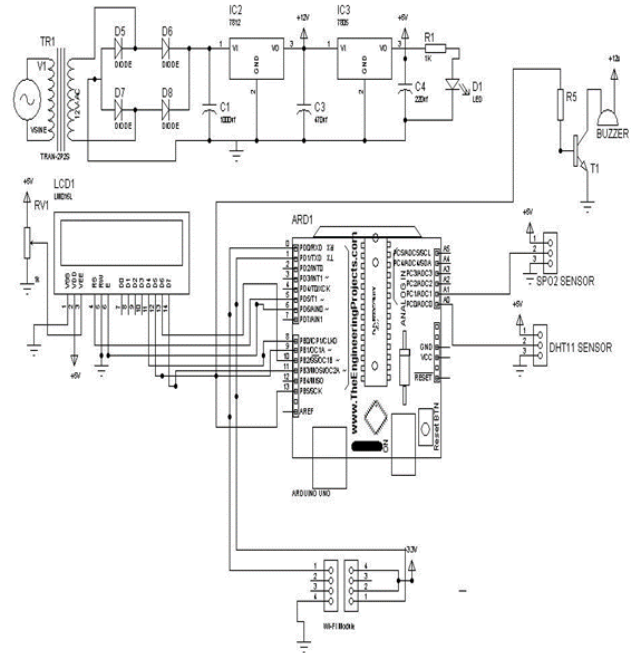
A. Working: The sequence of actions for the entire working procedure of the system with the required details is depicted in this section. The figure of the system working procedure is as follows:

- (a) The waste water from two sources is considered.
- (b) The pipeline of different areas connected with different infrastructures is checked.
 - (i) If the pipeline is blocked, the blockage location is recorded in the particular area's server and further sent to the central server for required analysis with respect to her areas. A notification is also generated to warn the respective area's drainage maintenance authority.
 - (ii) If the pipeline is not blocked, the water is passed to a container for filtration.
- (b) The drain cover of roadside drains are checked.
 - (i) If the drain cover is blocked, the object's width is recorded that is unable to pass through the drain cover.
 - (ii) If the drain cover is not blocked, the water is passed to a container for filtration.
 - (iii) If the object creating an obstacle is a living object, then it is being recorded. The object is matched to detect whether it is both of a specific width and a living object and hence is not allowed to pass through the drain cover.
- (c) If the object creating an obstacle is not a living object and is of a specific width, it is allowed to pass through the drain cover and further to the container for filtration
- (d) The wastewater, along with solid wastes, goes

through a filtration process inside a container.

- (c) If it is a solid waste, then it is being stored in a container.
- (d) If the container is filled up, they are being sorted using a sorting system. They are recorded basing on their type and amount. Furthermore, they are sent to different recycling/fertilizer processing companies and are also being record.

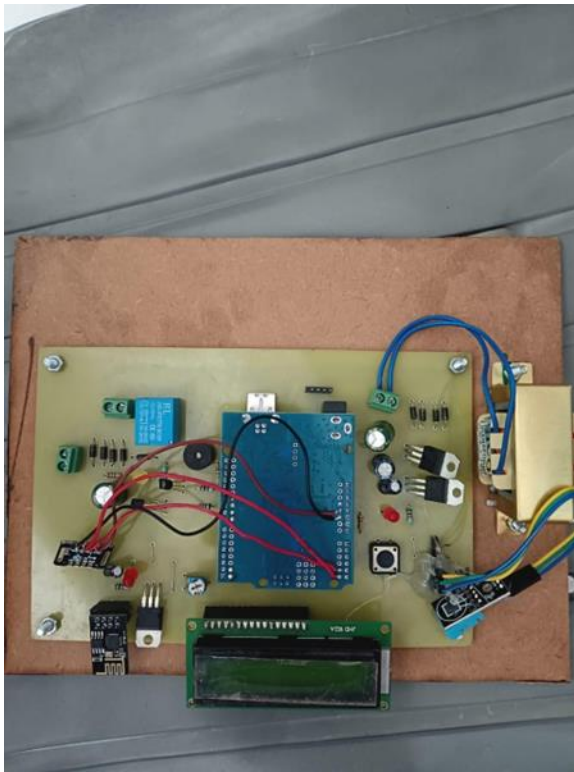
IV. CIRCUIT DIAGRAM



Project is to determine the line-to-line fault as well as the line to ground fault using an arduino board. while a fault occurs for some reason, the repairing process related to that particular cable is difficult due to not knowing the exact location of the cable fault. the project uses the standard concept of ohms law i.e., when a low dc voltage is applied at the feeder end through a series resistor (cable lines), then current would vary depending upon the location of fault in the cable. in case there is a short circuit (line to ground), the voltage across series resistors changes accordingly, which is then fed to in built adc of arduino board to develop precise digital data for displaying kilometers. It is assembled with asset of resistors representing cable length in KM's and fault creation is made by a set of switches at every known KM to cross check the accuracy of the same. The fault occurring at a particular distance and the respective phase is displayed on a LCD interfaced to the Arduino board

VI. RESULT AND MODEL

As we all know, the overflow of waste on the road in the metropolitan city and even in small cities becomes a big issue, and if the waste is overflowing for a long period which is not taken care of by the municipal corporation on time, then it leads to high risk for those who stay in those areas, and it affects their health. Most of the time it is observed that people are complaining on time regarding the drainage issue, but those complaints are not taken into consideration and proper action is not taken on time. To overcome this problem, we proposed a system that is smart drainage which is monitored through IoT, and before the overflow of drainage, it will detect through sensors via communication network on which complaints are registered by people to their respective departments via SMS and email notification to take action on time



CONCLUSION

The observation of drainage is a difficult task for the manual scavenger. To solve the problem of manual scavengers, system has been proposed to reduce the effort in taking care of drainage and cleaning consult. This system is quite different from other systems, which

help to overcome the drainage issue. This system includes various parameters like level of wastage, flow, and poisonous gases which is harmful to humans. The whole system is based on IoT which is monitored through Arduino via sensor and update all the data of sensors on the cloud. This system will give us real-time updates via SMS, Email, and on the IoT website before the over flow of drainage, which is helpful for manual scavengers as well as people, who are living in their respective locality with drainage.

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