

**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING AND INFORMATICS

FINAL YEAR PROJECT REPORT

**Design and Implementation of a Smart Sewage Monitoring and
Notification System**

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*Final Year Project Report Submitted to the Department of Computer and Informatics of
Busitema University in Partial Fulfillment of the Course of Study*

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DECLARATION

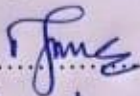
I MASABA TIMOTHY, declare to the best of my knowledge and understanding that this is my original work and confirm that this report gives accountability of my final year project and has never been submitted to any university or any institution of higher learning for any academic award.

Signature..........

Date.....13th/June/2024.....

APPROVAL

The final year project report under the title “smart sewage monitoring and notification system” has been done by myself under the guidance of my supervisor and therefore I forward it to the department of Computer Engineering, Busitema University with the approval of the supervisor

Signature 

Date 19/06/2024

Mr. ARINEITWE JOSHUA

Department of computer engineering and informatics, Faculty of Engineering Busitema University.

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ABSTRACT

Institutional settings, particularly universities like Busitema University where there are a number of manholes put in place, face significant challenges with sewage infrastructure management, especially concerning the risk of flooding. The potential consequences, including pollution and infrastructure disruption, underscore the critical need for robust monitoring and management solutions. Traditional methods like manual inspection which is currently used in monitoring the manholes often prove inadequate in addressing these challenges efficiently and cost-effectively, necessitating innovative approaches.

This document proposes a comprehensive solution, a sewage monitoring and notification system leveraging Arduino technology interfaced with Sewage Level sensors and GSM technology for notification and a web application for monitoring the levels of sewage on a daily basis. Tailored for implementation within the manholes of institutional settings like universities and urban areas where a number of manholes have to be monitored simultaneously, this system offers proactive management capabilities for the university's sewage infrastructure. By integrating geographic data and cutting-edge sensor technology, it enables timely interventions to mitigate flooding risks and ensure optimal sewage management across the university campus. This proactive approach not only enhances operational efficiency but also minimizes potential environmental and public health hazards associated with sewage system failures.

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LIST OF ACRONYMS

GND pins	Ground pin
IDE	Integrated development environment
GSM	Global System for Mobile Communications
SMS	Short Message Service
IoT	Internet of Things
Web App	Website Application

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CHAPTER 1 INTRODUCTION

1.1 BACKGROUND.

In urban areas of Uganda, including institutional settings like universities, ensuring access to safe water, proper sewage drainage systems and sanitation services is crucial for community well-being. However, limited and inefficient sewage monitoring systems poses challenges in meeting the needs which in turn causes non-predetermined sewage manhole overflows leading to poor sanitation and induces bad smell around places of residence. Despite financial constraints, stakeholders are committed to prioritizing the development of water and sanitation infrastructure. Through targeted interventions, they aim to enhance access to essential services, promoting socio-economic development across urban areas and institutional settings in Uganda.

A sewage monitoring and notification system is essential for effectively managing sewage systems, which are responsible for collecting and transporting waste from various sources to treatment plants or facilities. Despite their importance, these systems face numerous challenges, particularly in their management and maintenance.

Factors such as severe weather conditions, accumulation of obstructive materials, and groundwater infiltration contribute to the strain on sewage systems. Additionally, the growth of communities exacerbates these challenges, leading to increased pressure on existing infrastructure. The result can be Septic tank overflows and backflow into residential areas, posing significant health hazards and environmental risks [1].

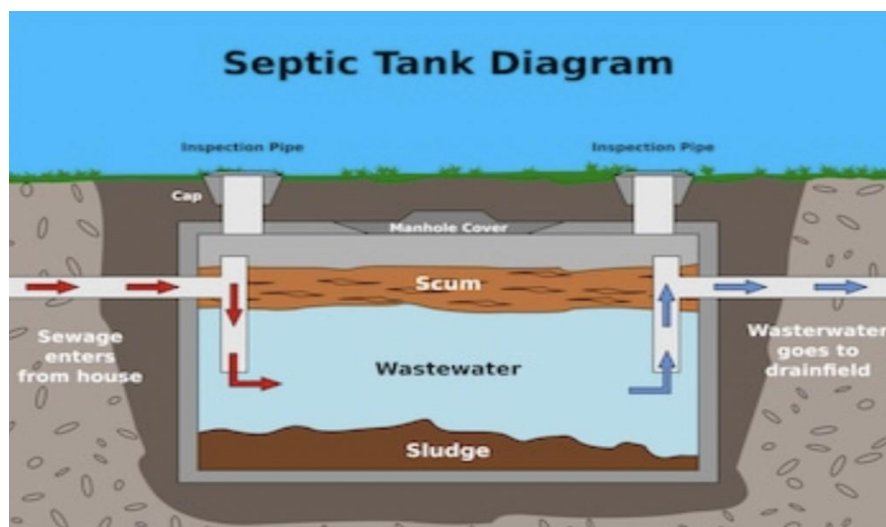


Figure 1 shows the structure of the septic tank underground

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