

**BUSITEMA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**DEPARTMENT OF COMPUTER ENGINEERING**

**A SMART WATER METERING SYSTEM**

**By**

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**DECLARATION**

I, Nampeera Moreen, BU/UP/2013/1462 do hereby declare that this Project report is original and has not been submitted for any other degree award to any other University before.

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## **APPROVAL**

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## DEDICATION

I dedicate this report to my beloved parents Mr and Mrs Mayengo, my siblings, my excellent supervisor Mr.Lusiba Badiru and all my friends.

Thank you all.

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May the ALMIGHTY ALLAH bless the works of your hands.

## **LIST OF ACRONYMS**

AMI: Advanced Metering Infrastructure

AMR: Automated Meter Reading

API: Application programming interface

LCD: Liquid Crystal Display

NWSWC: National Water and Sewage Corporation

SMS: short messaging system

## **ABSTRACT**

Water is an essential resource to the human race, it used for domestic consumption, industrial use, in agriculture, hospitals and in various institutions. Due to its demand and being limited, water must be used with accountability. The government of Uganda through NWSC takes responsibility to bill water usage and hence get revenue. However, a lot of money is spent on connection and disconnection process.

Customers can also be inconvenienced by bills for monthly arrears not arriving on time and sometimes the constant monthly movements and long queues in order to settle their monthly arrears result into a waste of time and loss of revenue to national water and sewerage corporation (NWSC).

Therefore, this project was aimed at developing a smart water metering system where customers use water which they have paid for, i.e prepaid water. The designed system is able to disconnect and connect the customer after paying for water.

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# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background**

On average, towns in Uganda are growing at a high rate, for example 5.6% for the case of Kampala[1]. And rapid urbanization is making it more and more difficult for governments to provide adequate piped water services[2]. Water service provider (NWSC) faces considerable challenges to meet this growing demand, and lack enough resources to do so. The current revenue flows of most also fall far short of requirements to fund investments and run services effectively for these rapidly growing populations.

Water is an essential resource to the human race, it used for domestic consumption, industrial use, in agriculture, hospitals and in various institutions. Due to its demand and being limited, water must be used with accountability. The government of Uganda through NWSC takes responsibility to bill water usage and hence get revenue. However, a lot of money is spent on connection and disconnection process.

Customers can also be inconvenienced by bills for monthly arrears not arriving on time and sometimes the constant monthly movements and long queues in order to settle their monthly arrears result into a waste of time and loss of revenue to national water and sewerage corporation (NWSC). Also many people complain about their water bills because they cannot understand the readings on their water meters and they don't know if the readings that are presented to them on their bills are what their meter readings are reading and even if they were to check what the meter reads, the readings would be different as the meter keeps on counting after the reading is taken and by the time the customer gets his bill the meter will have a new reading.

With smart water metering system, the user will be able to pay for water before using it at convenience using mobile money, in addition it helps to remotely monitor the amount of water used and the remaining balance. In this case, money spent on paying the field workers to connect and disconnect defaulters is saved hence increasing on the government revenue.

## **1.2 Problem Statement**

National water and Sewerage Corporation spends a lot of money on paying workers who provide monthly bills to customers, disconnect and reconnect defaulters and hence reducing on the revenue collected per month. Also, there is customer dissatisfaction for approximated billing

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