BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

PROJECT REPORT

RFID Based Teachers' Attendance Logging System

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DECLARATION

I **WEKYAYE LASTONE** Reg. No **BU/UG/2012/1801** hereby declare that this project report is my original work except where explicit citation has been made and it has not been presented to any Institution of higher learning for any academic award.

Sign: ……...

Date: ……

APPROVAL

The undersigned certify that they have read and hereby recommend for acceptance of Busitema University project report entitled **"*RFID Based Teachers' Attendance Logging System*"**

Mr. Bwire Felix

Department of Computer Engineering

Sign: …….

Date: ……..

DEDICATION

To my family am proud of you.

To my brothers and sisters.

To my parents you stand above all of us may God bless you.

ACKNOWLEDGEMENT

This report could not appear before the eyes of you my ardent readers without the efforts of various personas.

First to the Department of Computer Engineering for the technological knowledge imparted to me since I joined the university.

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To my fellow students who have endured with me this long trek to achieve this rather prestigious award ,Sanon Julian, Edison, Zipola,Henry, Lillian, Isaac, Daniel,the list is endless, thanks so much.

ABSTRACT

In a school setting identification of teachers with regard to attendance of lessons takes a major concern of every stake holder in the education sector. With the current trend in Ugandan schools where teacher(s) presence in a school is realized by signing an arrival/departure book and lesson attendance books, this is not enough to guarantee attendance to the lesson because this is rather too manual and synchronizing the two books becomes difficult. Even with lesson attendance books which only provide for time in and time out don't cater for the various time lost due to the long or rather short breaks out of class that accumulates to valuable lost contact time to learners. The system developed provides a working solution since it is based on RFID technology where the teacher is automatically supervised by the Administrator. With this system the classroom module with the help of an RFID reader an RF card that is carried by the teacher is automatically scanned every time the card passes the reader and this information is relayed by the transceiver using RF technology to the system connected to the database on a computer in the Administrator's office. The data kept by the system provides a basis for evaluating the performance of a teacher in specific period of time.

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LIST OF ABBREVIATIONS

AC	Alternating current
ADC	Analog to digital converter
AVR	Advanced Virtual RISC
COM Port	Communication Port
DAC	Digital to Analog Converter
DC	Direct current
DDR	Data Direction Register
DOS	Director of Studies
H/M	Head Master/Mistress
I/O	Input/output
IC	Integrated circuit
RF	Radio Frequency
RFID	Radio frequency identification
RISC	Reduced Instruction Set Computer.
USB	Universal Serial Bus
USART	Universal Synchronous Asynchronous Receiver Transmitter

CHAPTER ONE:

INTRODUCTION

1.0 Introduction

This chapter consists of the background of the study, problem statement, objectives of the study, justification, significance, scope and the limitations.

1.1 Background

Enrolment for primary education in Uganda has grown significantly in recent years and the gender gap between girls and boys has reduced, so that almost equal numbers of girls and boys now attend primary school. But despite these successes, challenges still remain with the education system in Uganda, the quality of education provided being the biggest of these challenges.[1]

Very often, children are going to school, but they are not learning, and one of the biggest factors contributing to this is the high rate of teacher absenteeism. According to data from education authorities, 20 to 30% of teachers can be absent at any one time in each district, with one school reporting a teacher absence rate of 62%. This, in turn, leads to irregular pupil attendance – there are no consequences if they are absent as they are simply following the lead of their teachers. 27% of children in Uganda are not in school at any given time.[1]

Every organization whether it be an educational institution or business organization, it has to maintain a proper record of attendance of students or employees for effective functioning of organization. Designing a better attendance management system for students so that records are maintained with ease and accuracy was an important key behind motivating this paper. This would improve accuracy of attendance records because it will save valuable time of the students as well as teachers. A proper record of attendance of students should be maintained by the teachers or lecturers in every schools, colleges and universities[2].

Attendance of students in class is important and can be considered as the starting point towards attaining a good education. Recording and monitoring the attendance of students is an area of administration which requires significant amount of time to get necessary data. Up until now, class attendance records have been maintained manually by having students sign next to their names on printed class lists during class[2].

This project is prototype of a system that monitors the attendance of secondary and primary school teachers to lessons. This is managed by the school's supervisor of teachers who may be the Director of Studies (DOS), the Head Master/Mistress (H/M) or any other individual given such authority by the school administration. The supervisor have a computer that runs an application (software) which he/she uses to view information about teachers, the classes they are supposed to teach, the times they are supposed to be in any given class and how such teachers are doing their work. The software provides, on a real-time basis, record the time at which any teacher is entering any given class and the time at which he/she is leaving. The supervisor therefore is be able to monitor the attendance of teachers to their prescribed lessons. And such data logs may be used for further evaluation using other software tools that are optimized for data analysis.

Every teacher is registered with the system and given a portable electronic card that can be used to detect him when he/she enters any classroom. Every class therefore needs to have static system than can detect such cards possessed by the teachers and communicates wirelessly with the computer application in the supervisor's office.

The communication between the teacher and the in-classroom system are all wireless with the use of Radio Frequency Identification (RFID) technology and thus, no teacher needs to manually inform the system of his/her entrance into or departure out of the classroom. The Communication from the classroom system to the computer system is wireless though this employs the use of Radio Frequency (RF) Transmitters in every classroom and an RF receiver in the office.

The receiver is connect to the computer via a common communication port (COM Port) like a Universal Serial Bus (USB) Port such that the system can easily communicate with any kind of computer.

Whenever a teacher is *just* detected in the class the classroom system logs into the computer system by sending a message including the unique identifier of the teacher. A similar message is sent when the teacher just walks out of the classroom but information is added to indicate whether the teacher has moved in or out. The computer application automatically records the time at which the message has been received. Considering the fact that the system is real-time, this time stamp has only a small negligible difference from the time at which the teacher just walks in/out of the classroom.

1.2 Problem statement

Especially in secondary and primary schools, teachers are expected to follow teaching schedules and teach for as long as it is prescribed to them each. Whereas they come to their work station (the schools), it is not a guarantee that they attend to their lessons, thus end up *dodging* some lessons. This takes either of two aspects. Besides completely failing to attend a lesson, a teacher may teach for less than the required time either by coming late and/or leaving early, or by frequently taking breaks out of the classroom. As a result, the supervisor is usually overwhelmed with checking every class and such supervision has large efficiency loopholes. There is therefore, need for a convenient system that automatically monitors the way the teacher attends lessons.

1.3 Objectives

1.3.1 General objective

To design and implement an RFID Based Teachers' Attendance Logging System that automatically reports the attendance of teachers to lessons to a computer based database system on a real-time basis

1.3.2 Specific objective

i. To analyze the current teachers' monitoring system and project literature
ii. To design a computer-based database system for teachers monitoring.
iii. To design an RFID based teacher detection system for the classrooms and a communication system to the computer based system.
iv. To combine the subsystems and implement the whole proposed system.
v. To test and validate the system.

1.4 Justification

Considering the fact that the system avoids the need for the supervisor to walk around classes, the project makes the supervision of teachers more convenient than it is in the current manual system.

The supervisor also gets his/her time that he/she would spend walking around saved and thus can do other important work while in a stable station in his/her office and also allows for supervision of other teachers at the time when he/she is also teaching.

Manual supervision was also found to be interrupting and disrupting to both the teacher conducting a lesson and the students as they see the supervisor walk around the classroom, and sometimes piping through the windows.

The system also avails a transparence aspect based on the fact that records are taken by the system and not easily editable and thus a 'caught dodging teacher' cannot easily deny the allegation.

The system also has extra features that make it significant and these include

- It can easily be modified for use in large schools or even higher authorities like Boards of Directors (BODs) and the District Education Officer (DEO)
- Rather than just real-time logging/reporting of the attendance, the system also store records and this makes it a foundation for evaluation of teachers.

1.5 Scope

1.5.1 Content scope

The system is designed to work for a single school and not a group of schools. In this case, the system requires just one computer that should reside within the school premises. It is assumed that the supervisor's office is located in the middle of all classes with a maximum

separation of 120 meters although a central electronic device may be installed in the middle of the classrooms and this links to the supervisor's office through a cable.

Considering the fact that the system requires a computer, it may not apply to schools in remote rural areas with no steady power supply. The classroom systems is be powered by any source as may be determined by the school, though a 12V backup battery may be used to make sure that the system is always powered. The project however does not concentrate on power supply, bearing in mind that systems have already been developed to manage power.

Whereas schools are known to have very many classrooms, this project considers a variable number of classrooms in the computer software system. However, electronic systems for detection of teachers was developed for only one classroom. This was done in order to reduce the project cost since similar systems are required for every classroom.

1.5.2 Geographical scope

The system was designed to be deployed in Schools in Uganda and provided the schools have power.

1.5.3 Time scope

The system was developedin7 months.

1.6 Limitations

The system limited to monitoring Teachers'attendance.

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