NATIONAL INSTITUTE OF TRANSPORT (NIT)

DEPARTMENT OF COMPUTING AND COMMUNICATION TECHNOLOGY

FINAL YEAR PROJECT PROPOSAL REPORT

TITLE: AUTOMATED STUDENTS ATTENDANCE MANAGEMENT SYSTEM USING BLE TECHNOLOGY

FULL NAME : ROBINSON E. ANTHONY

REG. NUMBER : NIT/BIT/2020/1229

PROGRAM : BACHELOR DEGREE OF PROJECT

SUPERVISOR : MR. JOVIN J. KAMALA

ACADEMIC YEAR : 2022/2023

DECLARATION

I, **ROBINSON EMMANUEL ANTHONY**, hereby declared the project work entitled **AUTOMATED STUDENTS ATTENDANCE MANAGEMENT SYSTEM USING BLE TECHNOLOGY** is an authentic record of my own work carried out at National Institute of Transport under the guidance of the entire Department of Computing and Communication Technology (CCT). This project proposal is submitted in the partial fulfillments' requirements for award of the bachelor degree in Information Technology.

Signature: …….

Date: ……

ACKNOWLEDGMENT

First of all i would like to thank the almighty God for the gift of life, health and ability for accomplishing this project proposal and I would like to express my deep gratitude to my project guides Mr. Jovin John Kamala ,Mr. Bernard Hayuma, Mr. Shaban Juma Bakari and Livingstone Kimario from Department of Computing and Communication Technology, for there guidance with unsurpassed knowledge and immense encouragement. I am grateful to Dr. Angelo Runyoro the Head of the Department of Computing and Communication Technology, for providing good support for accomplishing this project proposal. A Lot of thanks goes to National Institute of Transport(NIT) through Department of Computing, Communication and Technology (CCT) to ensure me to implement what I have being studying in all years of study in NIT their contribution in this project proposal is valuable and meaningful. I would like to thank my parents, friends, and classmates for their encouragement throughout the project proposal accomplishment. At last but not the least, we thank everyone for supporting me directly or indirectly in completing this project successfully.

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LIST OF ABBREVIATIONS

BLE	BLUETOOTH LOW ENERGY
CCT	COMPUTING AND COMMUNTICATION TECHNOLOGY
DR	DOCTOR
IOT	INTERNET OF THINGS
MR	MISTER
NIT	NATIONAL INSTITUTE OF TRANSPORT
UI	USER INTERFACE
UX	USER EXPIRIENCE

CHAPTER ONE

INTRODUCTION

1.0 Chapter Summary

In this chapter, I will quickly make you explanation the background, problem statement, objectives, significance and the scope of the automated location based time and attendance system

1.1 Background of the Study

The idea about the study came from A location Based Time Attendance system that was conducted by Mohammad Salah Uddin from India. The project that was conducted based on attendance of employee and use of GPS technology in tracking the attendance of the employee of an organization.

After studying the idea I came up with a new way of implementing the attendance system using BLE technology to track the student attendance

1.2 Problem Statement

Over the years the student attendance system that is mostly used is Manual attendance system. Manual attendance system use sheets of paper that students fill out and sign and lecturers oversee for accuracy of the student. However, attendance information in Manual attendance system is subjected to human error when various students fill the sheets of paper and also it is time consuming system.

1.3 Objectives

1.3.1 General Objective

The objective of this study is to develop an automated student attendance management system using BLE technology.

1.3.2 Specific Objectives

i. To develop a subsystem that will automatically capture students' attendance data using BLE technology;

ii. To develop a subsystem that will process and store the captured students' attendance data, and;

iii. To develop a subsystem that will report the students' attendance.

1.4 Significance of the Study

i. The system is full automated,
ii. Easy in Installation of Mobile app for student,
iii. An automated system reduces the risk of errors that are common in a manual system,
iv. Allows the workforce to be more productive instead of wasting time on tedious administrative tasks.

1.5 Scope of the Project

The system will be designed and developed to operate on smartphones and web browsers And will be developed for NIT.

CHAPTER TWO

LITERATURE REVIEW

2.0 Chapter Summary

In the previous chapter, we had an overview of all the background of the study and the objectives and significance and objective of the project and the scope that the project will cover and the scope that the project will not cover.

This chapter focuses on what I ready from the books and from the internet. Here I will cover the current practice that is used in collection of attendance what are the existing related solution in the market and there weakness and write a preview of the proposed system and will come to overcome those weakness of existing systems available in the market.

2.1 Current Practice

The current practice is the manual attendance system that uses sheets of paper that students fill out and sign and lecturers oversee for accuracy of the student. However, attendance information in Manual attendance system is subjected to human error when various students fill the sheets of paper and also it is time consuming system.

2.2 Existing Related Solution in the Market

The are different solution in the market that provide solution to the current system. This systems are facial recognition technology technology and barcode reader technology.

2.2.1 **FINGERPRINT TECHNOLOGY**

Fingerprint attendance is one type student attendance that uses fingerprint as the media. A fingerprint is one of unique human identities for each individual. The steps for performing fingerprint attendance are also accessible. In the beginning, students only need to register a few fingerprint. Once registered, students stick their registered fingers when they enter or leave the venue.

Weakness of Fingerprint Technology

i. Issues with recognition of damaged fingerprint technology

ii. Deployment can be Expensive

iii. Not ideal for remote and field works

iv. System Failure

2.2.2 BARCODE READER TECHNOLOGY

The system that takes down student's attendance using barcode. Every student is provided with a card containing unique bar-code. And Every bar-code represent unique id of students.

The system uses Barcode method for authenticating the student with a unique barcode that represents their unique id.

Weakness of Barcode reader

i. Cost

ii. Range

iii. Physical Damages

iv. Label Damages

v. Information

vi. Security

2.2.3 FACE RECOGNITION

A face recognition based attendance system is the technology to identify or verify an individual using their facial features. This system can be used to recognize people in images, videos, or in the real-time event.

Weakness of Face Recognition

i. Image Quality

ii. Storage

iii. Angles

iv. Biased performance

2.3 Preview of the Proposed System

Automated Location based Time and Attendance Tracking System provides many benefits to an institute. It enables an lecturer to have full control of all students who attend in his or session. It helps control student attendance by reducing errors of the existing system that is the use of paper or Manual attendance system , which are often caused by human error.

In this system I will use the IOT knowledge in order to provide good operation of the system. IOT idea into work on the use of BLE beacons.

STRENGTH OF PROPOSED SYSTEM OVER OTHER SYSTEMS.

i. Cost

ii. Storage

iii. Range

iv. Real time Information

CHAPTER THREE

METHODOLOGY

3.0 Chapter Summary

From this chapter we are going to understand about all methodologies that the automated location based time and attendance system will use in order to come up with the best system. This will involve data collection method, data analysis and the system development methodology that will be used with the proposed system.

3.1 Data Collection Method

The data collection method that have been used for the proposed system are observation and an interview.

3.1.1 Observation Data Collection Method

In observation data collection method I have use participant observation, where I participant as the student. The place that I conducted collection of data using observation is at NIT.

3.1.2 Interview Data Collection Method

And also I have semi structured interview under interview data collection methods. The interview data collection was also conducted at NIT specific in CCT department. Where the main interviewee is the lecturer. The question that were asked are found on appendix 3 of this proposal.

3.2 Data Analysis

The responses I received from different users of the current system after data collection was good where all participate who participated in the data collection provided me with different answer.

The response will help me to designing and developing a new system that will over come different problems that are present in the current system in which the proposed system will be user friendly system .

3.3 System Development Methodology

SPIRAL METHODOLOGY

The methodology that will be used in system development is spiral model, this is is due to the data analysis. The reason select this method is because the method allows me to also use incremental i.e the method allow to design and develop and test the modules every time and test there integration.

Phases

i. Planning of objectives

   In this phase I going to plan for all objective for the system that should be design and constructed and later evaluated for best performance.

ii. Design

   In this phase I will design the UI/UX designs, the system architecture, the system data flow design and design the relational database that will assist in the process of developing the system.

iii. Codding

   Here the design comes to implementation. In this phase I will implement the UI/UX design using the flutter and angular framework and use express and mysql and Graphql for creating the server for storing the user data.

iv. Evaluation

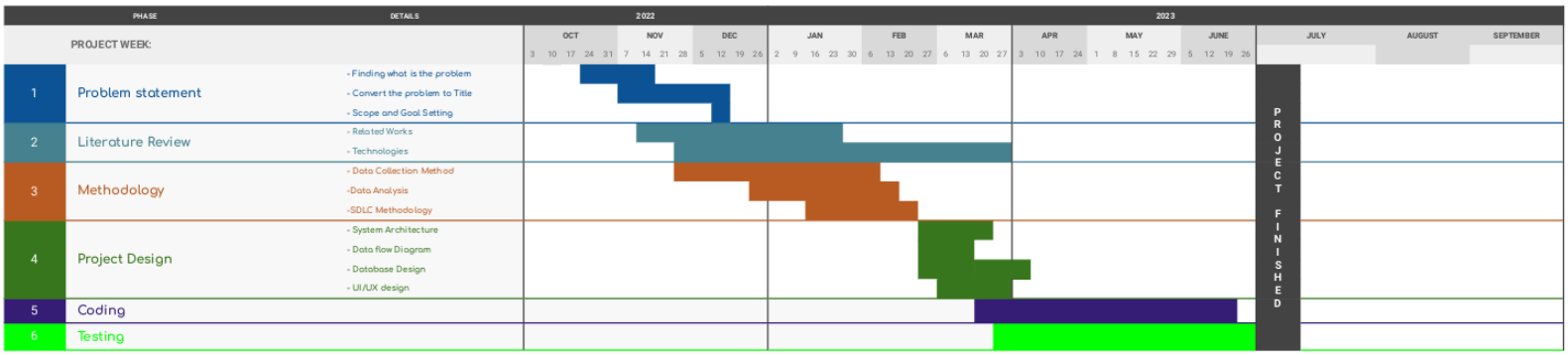
   In this I will evaluate the system performance according to the objectives that where planned in phase one.

   NOTE: All this phase will be apply to each module of the system accordingly and in incremental.

APPENDIX 1

PROJECT TIMELINE

PROJECT TITLE	Automated location based time and attendance system	COMPANY NAME	NATIONAL INSTITUTE OF TRANSPORT
PROJECT MANAGER	Robinson Emmanuel Anthony	DATE	10/24/22



APPENDIX 2

PROJECT BUDGET

REQUIREMENTS	DESCRIPTION	COST
HARDWARE COST	BLE BEACONS	290,000
TELECOMMUNICATION COST	5,000 @ week	170,000
PRINTINGS	Include documents and books	50,000
MISCELLANOUS COST		

APPENDIX 3

INTERVIEW QUESTIONS

i. Which is the student attendance system are they use currently

ii. How do they evaluate the student attendance

iii. How do they evaluate the student attendance

iv. How do they evaluate the student attendance