**THARAKA UNIVERSITY ONLINE ATTENDANCE SYSTEM**

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A project proposal submitted to the Faculty of Physical Sciences, Engineering and Technology in Partial Fulfilment of the Requirements for the award of Diploma in Computer Science of Tharaka University

July, 2024

# DECLARATION

I hereby declare that this project is based on my original work except for citations and quotations which have been duly acknowledged. I also declare it has been previously and concurrently submitted for a diploma or any other award in any other educational institution.

Student Name:

………………………………………….

Signature:

………………………………………….

Date:

………………………………………….

**APPROVAL**

This project was conducted under our supervision and is submitted with our approval as university supervisor.

Supervisor Name: ………………..

Signature: …………………

Date: ……………………

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# DEDICATION

This project is dedicated to my family, whose unwavering support and encouragement have been the cornerstone of my journey. To my parents, [Dad, David and my Mum, Bendetta], for their endless love, sacrifices, and belief in my abilities. To my siblings, [brother' Peter], for their constant encouragement and for always being there when I needed them.

I also dedicate this work to my mentors and teachers, especially [lecturer, Francis and my Mentor Lecturer Dismus Cheruiyot Korir], who have inspired and guided me through the challenges and triumphs of this project. Their wisdom and insights have been invaluable.

Lastly, I dedicate this project to all my friends and colleagues, particularly [William, Martin, David, lucy, Alex, Gatwiri and Caro], whose camaraderie and support have made this journey a memorable and enriching experience.

# ACKNOWLEDGEMENT

I would like to express my deepest gratitude to all those who contributed to the successful completion of this project.

First and foremost, I would like to thank my project supervisor, lecturer, Francis for his continuous support, valuable guidance, and insightful feedback. His encouragement and expertise were instrumental in shaping this project.

I would also like to thank THARAKA UNIVERSITY for providing the necessary resources and a conducive environment for carrying out this research. Special thanks to COMPUTER SCIENCE DEPERTMENT for their assistance and cooperation.

A heartfelt thank you to my colleagues and friends, [Ann, Joy, Grace, bravo, Stephen, Dante] for their constant support, brainstorming sessions, and for always being available to discuss ideas and offer constructive criticism.

I am particularly grateful to my family for their unwavering support and understanding throughout the duration of this project. Their patience and encouragement have been a constant source of motivation.

Lastly, I would like to extend my appreciation to all those who contributed, directly or indirectly, to this project. Your support and encouragement have been invaluable.

# ABSTRACT

Student attendance play a significant role in order to justify academic outcome of a student and school as overall.

In chapter one of my project it confirms that a preliminary study has been conducted in one of Universities in Kenya, Nairobi in order to understand the Online attendance record keeping process. Through interview session, Student Attendance System development team, have identified that teachers and school management face problems in recording and managing attendance of their students. Therefore, Student Attendance System has been proposed and developed. Need for a tool to systematically keep the student’s attendance record increased due to increasing number of school students. Upon completion of Student Attendance System, user acceptance testing conducted among potential end users. Result shows most of the user satisfied with the system with some minor changes required.

In chapter two of my project discus review of related works as done by previous researchers in the vie of implementation of online attendance system in universities. There are some of implementation in this system discussed in chapter two i.e. the system developed would be web-based application .it will facilitate access to attendance of a particular student.

In chapter three of my project, I have discussed various ways of data collection methods that is; conducting surveys, interviews and observation methods. I have continued and stated the target population that my project will cover that is; lectures, students and teachers.

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# CHAPTER ONE: INTRODUCTION

## Introduction

The process of taking attendance in educational institutions is crucial for tracking student participation, engagement, and ensuring compliance with academic regulations. Traditional methods of attendance taking, such as roll calls or sign-in sheets, are time-consuming, prone to errors, and susceptible to manipulation. To address these challenges, many institutions are exploring automated attendance systems using modern technologies. One such technology is online attendance system tracking.

## Background Information

Attendance record plays a significant role in the academic achievement of school students. Insufficient performance in school attendance leads to least performance in academic achievement[1]. A survey has been conducted in New York City public schools to study the role of school attendance as a mediator in relationship between student’s grades in school test. At the end of the study, they found that attendance as the full mediator for grades in the school tests[2]. By knowing these facts, attendance of a student should be given higher priority regardless of any school’s categories. However, attendance keeping process becomes tedious due to increased number of students in schools now days. In Malaysia, the statistics by UNESCO shows in the year of 2006 the secondary school population enrolment is about 3201. Conventional way of taking attendance will be no more relevant to be used with this increasing number of students. Moreover, unavailability of proper attendance tracking tools make the situation some worst especially in Malaysia’s secondary schools.

[3]Teachers have to spend lot of time in calculating the class attendance and to produce daily, weekly, monthly and yearly reports. Automated attendance record keeping tools needed by schools’ authority to keep track student’s attendance and to generate all the report required. A study has been conducted in one of the secondary schools in Kuala Selangor district, Malaysia in order to understand the manual way of attendance recording process.[4] Based on the observation done, most of the teacher can’t trace their student’s attendance effectively due to very tedious calculation process is needed in order to comply with the standard set by Malaysia Ministry of Education[2]. Based on the study we have identified that each class teacher will be provided with attendance book. Refer to for a sample of secondary school attendance record sheet.[5] Teacher call students name one by one and mark their attendance in the attendance sheet. Student’s name needs to be filled up by teacher every month.

However, attendance keeping process becomes tedious due to increased number of students in schools now days. Conventional way of taking attendance will be no more relevant to be used with this increasing number of students. Moreover, unavailability of proper attendance tracking tools make the situation some worst especially in Kenyan university schools.

## Problem Statement

Traditional attendance methods present several issues that is, time consumption hence manual attendance taking can be slow, especially in large classes, leading to significant time being wasted that could be better used for instructional purposes. there are also human errors in recording attendance, such as missed entries or incorrect data, can occur frequently with manual methods.

There is a potential for attendance fraud where students sign in for absent peers and administrative burden since the manual entry and processing of attendance records require considerable administrative effort and resources.

## Objectives

## **General Objectives**

The primary aim of this project is to design and implement a online attendance system in a university setting.

### Specific Objectives

1. To develop a system that automates the attendance recording process using online technology, (Automate Attendance Recording) reducing the need for manual entry and minimizing errors.
2. To Improve Efficiency
3. To Enhance Data Accuracy and Reliability
4. To Provide real-time monitoring and tracking of attendance for classes and university events, enabling immediate oversight and intervention if necessary.

## Research Questions

1. How does the online attendance system Automate Attendance Recording?
2. How can online attendance system help in improving efficiency?
3. How does online attendance system improve the accuracy and reliability of attendance records compared to traditional methods?
4. What is the time savings achieved by using a online attendance system in large classes and university events?

## Significance of Study

The implementation of a online attendance system in a Tharaka university holds significant value for the targeted population, and the institution as a whole. The online attendance system significantly reduces the time required to take attendance, particularly in large classes or university events. This efficiency allows more time for instructional activities, enhancing the overall productivity of both students and faculty.

By automating the attendance process, the system minimizes human errors that are common in manual methods. This leads to more accurate and reliable attendance records, which are crucial for academic assessments and administrative decisions.

There will be reduction in Attendance Fraud by ensuring each student is assigned a unique code, making it difficult for students to mark attendance for their peers. This helps in maintaining the integrity of attendance records and ensures that the data reflects the true participation of students.

Real-time data collection and monitoring enable immediate oversight of attendance patterns. Administrators and faculty can quickly identify and address issues such as low attendance rates, improving student engagement and participation.

## Scope

The system will automate the process of recording attendance for students, faculty, and staff, minimizing errors and reducing manual workload.

# CHAPTER TWO: LITERATURE REVIEW

## Introduction

The purpose of this literature review is to provide a comprehensive understanding of the existing research and technological advancements related to online attendance systems in Tharaka University. Attendance tracking is a critical function in various sectors, education, corporate environments, and events management. Traditional methods of attendance recording, such as manual sign-in sheets and punch cards, have proven to be time-consuming and prone to errors. With the advent of digital technology, online systems have emerged as an efficient and reliable alternative for attendance management.

An online attendance system leverages online technology to automate the process of recording attendance. This system typically involves the use of scanners or mobile devices to scan unique assigned to individuals. The data is then transmitted to an online database, where it is stored, processed, and made accessible for analysis. Such systems offer numerous benefits, including increased accuracy, time efficiency, and ease of data management.

## Review Of Related Works

This chapter provides a review of related works on attendance management systems, with a focus on the application of online technology in Tharaka University. It examines the evolution of attendance systems, various technological solutions, and specific case studies highlighting the implementation and effectiveness of online attendance systems.

A system developed by [2] is a Web-based application developed for daily student attendance in departments within the university. It facilitates access to the attendance of a particular student in a particular class. The system will also help in generating reports and evaluating the attendance eligibility of a student.

A system mad by [6]came up with a solution of online attendance system which manages every task related to attendance in an efficient way. The system generates reports at the end of session, take backup for data recovery if system fails and do every calculation accurately.

A developer[7] developed a better system which is Web based; it is fully responsive where a user can use in mobile, tablets and different computer systems. In this system records are kept safe and secure and the attendance information of particular or all students of particular class can be accessed easily and without time consuming.

A system developer[8] came up with a system that manages to the analysis of the report creation and develops manual entry of the student attendance. First designed the student’s entry form, staff allocation and time table allocation forms.

## Conclusion

In conclusion I have Identified some Gaps**,**

There is a lack of detailed guidelines and best practices for seamless integration, which is essential for maximizing the system's effectiveness also User Training and Adoption is quit expressive, Many studies highlight the benefits of online systems but often overlook the challenges related to user training and adoption. Ensuring that students, faculty, and staff are adequately trained and comfortable with the new system is crucial for its success.

Although online systems are generally considered cost-effective, there is limited analysis on the long-term costs, including maintenance and potential upgrades. A comprehensive cost-benefit analysis over time would provide deeper insights.

While data security is acknowledged as a critical concern, many studies do not delve deeply into specific measures and protocols for protecting attendance data. Detailed strategies for ensuring data privacy and security need further exploration.

## Conceptional Framework

Each individual e.g., student, employee is assigned a unique webpage that is linked to their identity in the system.

Methods used to transmit the scanned data from the device to the online database e.g., Wi-Fi, Bluetooth, cellular networks.

Encryption and other security protocols to protect data during transmission.

Structure of the database to store attendance records, user information, and other relevant data (Database Design).

Methods for securely storing large volumes of attendance data.

Efficient retrieval methods to access and analyze attendance records.

How data will be collected and stored

User

**Fig 1** Use case diagram - *system* accessibility

# CHAPTER THREE: METHODOLOGY

## Introduction

This chapter provides a comprehensive introduction to the proposed Online Attendance System. It outlines the system's core functionalities, objectives, and the problems it aims to solve. The chapter also delves into the technical aspects, including the system architecture, development tools, and methodologies.

## Research Design

The research design for the Online Attendance System project encompasses the strategies and methodologies employed to achieve the project's objectives. It includes the plan for collecting, analyzing, and interpreting data necessary for developing and implementing the system. The research design ensures that the project follows a structured approach, leading to reliable and valid results.

## Target Population

The target population for the Online Attendance System encompasses the various groups of individuals who will interact with the system or be affected by its implementation. Identifying and understanding these groups is crucial for tailoring the system to meet their specific needs and ensuring its overall effectiveness. lecturers, Students and workers.

## System Design & Development

This section outlines the design and development tools, including the programming languages, frameworks, and other technologies used to build the Online Attendance System

daily attendance report

weekly attendance report

monthly attendance report

Generate warning letter

Record attendance

Generate attendance report

>>

<<

include

<<

include

>>

<<

include

>>

Teacher

Admin Staff

note absent seem

**Fig 2** Use case diagram - *system* functionality

Source: Tharaka Inst. (2024)

There are primary programming languages that I will consider to use for the development of the Online Attendance System are:

**JavaScript** and **Python**

**Others like; html and MySQL**

## Data Collection Methods & Tools

* Surveys

Method: Distributing structured questionnaires electronically to a representative sample of users (students, teachers, administrative staff).

Tools: Online survey platforms such as Google Forms, SurveyMonkey, or Qualtrics.

* Interviews to collect detailed qualitative insights from users.

Method used can be conducting semi-structured interviews with a subset of users from each target group. Tools are Video conferencing tools (e.g., Zoom, Microsoft Teams) or face-to-face interviews.

Table 1.0 Interview list

|  |  |
| --- | --- |
| **Interview Personnel** | **Number of participants** |
| Student | 20 |
| Teacher | 10 |
| Admin Staff | 5 |
| Person in charge for the student card | 2 |

Source: Tharaka Inst. (2024)

* Observations to observe user interactions with the system and identify usability issues.

Method used can be, conducting usability testing sessions where users perform specific tasks while being observed.

Tools are, Screen recording software and usability testing platforms (e.g., User Testing).

## Data Analysis

Data analysis is a critical component of the Online Attendance System project, as it involves processing and interpreting the data collected through various methods to derive meaningful insights.

The data Analysis in my project of online attendance system can be carried in different ways; i.e. Qualitative data Analysis, gathered from interviews, focus groups, and open-ended survey responses, will be analyzed to identify, analyze, and report patterns (themes) within qualitative data. There is also Quantitative data Analysis, collected through surveys, system logs, and performance metrics, will be analyzed using statistical techniques to quantify user feedback and system performance also to summarize and describe the main features of the quantitative data.

The tools used in data Analysis i.e.

SPSS for statistical analysis of quantitative data.

R and Python for performing both qualitative and quantitative data analysis.

Microsoft Excel for basic data analysis and visualization.

# 

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# APPENDICES

## Appendix I: Sample Questionnaire.

|  |
| --- |
| Age: Gender:  Major/Department:  How often do you attend classes?  Daily  Weekly  Monthly  How do you currently mark your attendance? (Manual/Online/Other)  Manual: Online:  How important is it for you to have an online attendance system?  Very Important: Important: Unimportant:  **Signature:**   * Participant Name: \_\_\_\_\_\_\_\_\_\_ * Participant Signature: \_\_\_\_\_\_\_\_\_\_ * Date: \_\_\_\_\_\_\_\_\_\_ |

## Appendix II: Time Scheduling

|  |  |  |  |
| --- | --- | --- | --- |
| **Key Activities** |  | **Estimated Duration** | **Expected Completion Date** |
| **Planning** |  | 3 weeks | [3/6/2024] |
| **Design** |  | 1 week | [18/6/2024] |
| **Development** |  | 1 week | [28/6/2024] |
| **Testing** |  | 4 days | [9/7/2024] |
| **Deployment** |  | 6 days | [18/7/2024] |
| **Evaluation** |  | 2 weeks | [25/7/2024] |

# Appendix III: Budgeting

| **Expense Category** | **Cost Range** |
| --- | --- |
| Software License | 5000- 10000 |
| Hardware |  |
| Devices (Tablets, Biometric Scanners) | $5,000 - $15,000 |
|  |  |
| Setup and Customization | $3,000 - $10,000 |
| Data Migration | $1,000 - $5,000 |
|  |  |
| Employee and Administrator Training | $2,000 - $5,000 |
|  |  |
| Annual Support and Maintenance | $2,000 - $5,000 |
| Network Infrastructure | $1,000 - $3,000 |
| Compliance and Security | $1,000 - $2,000 |
| **Total Estimated Budget** | **KES19,000 – KES115,000** |