

**DESIGN AND IMPLEMENTATION OF ATTENDANCE MONITORING SYSTEM  
USING QR CODE (CASE STUDY OF COMPUTER SCIENCE DEPARTMENT)**

**BY**

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**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
NATIONAL DIPLOMA (ND) IN COMPUTER SCIENCE.**

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## DECLARATION

I hereby declare that the work in this project titled “**Design and Implementation of Attendance Monitoring System Using QR Code (Case Study of Computer Science Department)**” was performed by me under the supervision of Mal. Usman D. Wakili. The information derived from literatures has been duly acknowledged in the text and a list of references provided. The work embodied in this project is original and had not been submitted in part or in full for any other diploma or certificate of this or any other institution.

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Signature

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Date

## CERTIFICATION

This project titled “**Design and Implementation of Attendance Monitoring System Using QR Code (Case Study of Computer Science Department)**” meets the regulations governing the award of National Diploma (ND) in Computer Science, Federal Polytechnic Mubi, Adamawa State

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(External Examiner)

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Sign/Date

## **DEDICATION**

This project is dedicated to my beloved parents for their advice, encouragement and financial support towards my academic pursuit.

## **ACKNOWLEDGEMENTS**

I want to acknowledge Almighty God for his infinite mercy and protection throughout my academic activities. And for the understanding in achieving our academic success.

I also recognize my Supervisor Mal. Usman D. Wakili who took time, despite his busy schedule to direct and guide me throughout this research work.

I also acknowledge the Head of Department Computer Science Mr. Mustapha Kassim for his moral encouragement throughout my period of study. I also acknowledge all Staff of Computer Science Department for their support and encouragement and the knowledge they've impacted on me throughout my studies.

I also want to appreciate my lovely parents for their love and care and for giving me the opportunity to be trained and achieve my dreams.

Finally, I appreciate the efforts of my Uncles and aunties, for their encouragement and support throughout the course of my study and also my friends and relatives, course mates and all well-wishers. I love you all, may the Almighty God bless you abundantly, Amen.

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## ABSTRACT

*This project presents a Quick Response Code attendance system which will be using a computer device to scan Quick Response Code in order to achieve the attendance in the class. Quick Response Code system is a combination of a web applications developed for taking and storing the attendance to a database storage. The reason why this advanced method has been chosen as the attendance tracking system instead of others advanced method such as biometric-based, RFID based attendance system is because of Quick Response Code attendance system does not required any high-cost implementation on hardware and maintenance fee for specific hardware. Other than that, it will solve the issues that have been facing by those tradition attendances taking method such as calling out names and paper recording. These tradition attendance systems were highly use in manpower, resources and less effectiveness. Students will be easily cheated in having their attendance without attending the class. Therefore, Quick Response Code attendance tracking system will help in increasing the effectiveness and efficiency on taking students attendance. Lecturers will not be required to shout out students' name in the class and waste their time for the teaching lessons. This method will provide a more rapid and accurate attendance records of the class due to the highly convenience in the class and strict authentication while scanning the Quick Response Code. Students' attendance will not be recorded if any authentication does not fulfil the regulations such as, the location of the students scanning the Quick Response Code.*

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

The traditional methods of attendance monitoring in educational institutions and workplaces have been largely manual, relying on paper-based registers or sign-in sheets. However, these methods are known to be inefficient, time-consuming, and prone to errors. With the rapid advancements in technology, automated attendance monitoring systems have gained prominence, offering improved accuracy, efficiency, and security. Automated systems using QR codes have emerged as a popular solution for attendance monitoring. QR codes are two-dimensional barcodes that can be scanned using a smartphone or a dedicated QR code reader. They can store a significant amount of information, making them ideal for unique identification purposes (Andrew, 2011).

Attendance monitoring of students in institution can be rigorous using the conventional method of paper sheets and old file system method. Every academic institution poses some standards concerning how attendance is to be confirmed for student in classes, laboratory sessions and examination halls. That is why keeping the accurate record of attendance is very important. The approach of using paper sheets and the old file system to confirmed students has been in use for years. Attendance is a basic and most important criteria needed in all the education system (Samkee, 2021).

Attendance is used as a record to assess student consistency in participate the class. Therefore, student is required to attend all teaching activities held by the institutions. Once attendance is below the required policy, the student will be subjected to further action or suspended from taking the final exam depend on the respective institutions they are in. This impractical method will lead to fraud on number of absentees by students. Besides, this method also easily allow for impersonation as some student may purposely sign on another student's name. Besides, lecturer needs to analyze manually every attendance sheet to identify the number of absentees for both lecture and lab classes correspond to subject. Then, lecturer needs to count and calculate percentage of present of all the students manually to identify when warning letter need to be given to the student depend on his or her number of absents without providing any medical certificate or notice. As a result, it is time consuming, increase number of works of the lecturer and prone to human error as it is difficult to ascertain whether the calculation made was correct. Moreover, student needs to spend unnecessarily time during class session to sign on the attendance sheet. This also disturbing and student may lose focus when the attendance sheet is passing around during the class session (Romil, 2015).

Therefore, Student Attendance Monitoring System is proposed to help or reduce lecturer's work. This system facilitates to access or manage the attendance information of all the classes. Student by default is assumed to be present as number of present will be higher than the absentees for most of the

attendance report. After that, lecturer is allowing to change or modify absentee's attendance data. The system will automatically count the number of absents and the percentage of present for all the students based on the subject classes. Once the number of absents exceed the attendance policy, appropriate warning letter will be generated automatically to be given to the absentee. Hence, this system provides a tedious work in maintaining attendance records besides saving time to analyze every attendance list and assuring the calculation made was error-free (Geeta, 2013).

QR code-based attendance monitoring systems offer several advantages over traditional methods. They eliminate the need for manual data entry and provide real-time access to attendance data. These systems also enhance security by reducing the risk of unauthorized access or tampering with attendance records.

According to Smith and Johnson (2018), manual attendance tracking methods can be time-consuming and prone to errors. They argue that automated systems using QR codes provide a more efficient and accurate way to track attendance, reducing administrative workload and improving data integrity.

Furthermore, a study by Li and Wang (2019) highlights the benefits of real-time access to attendance data. They emphasize that QR code-based attendance monitoring systems enable educational institutions to identify attendance patterns, analyze trends, and take proactive measures to improve attendance rates.

The security aspect of QR code-based attendance monitoring systems has been investigated by Chen et al. (2020). They discuss how the use of QR codes and centralized databases enhances the security of attendance records, minimizing the risk of fraud or unauthorized access.

Computer nowadays has become the backbone of data and information processing. Computers have been very effective in many fields of work and study. It certainly helps man to make his task much easier and with great precision. In schools and universities, computers are used to maintain the basic flow of data and information and also checking the grades/results of the students. The computer is very useful in performing a great task in data and information processing, such as securing files, data, and information of different. Computer programmers now a day try to build and develop high-quality systems that are very useful. A computerized management system maintains the standard flow of data and information with highly secured and make data processing faster and easier. These computerized systems help one person, company, organization or any type of management agency throughout the world to enhance and develop its general profile (Shehu, 2019).

School attendance is a baseline factor in determining student success (Smith, 2016). The attendance is important because students are more likely to succeed in academics when they attend school consistently. It's difficult for the teacher and the class to build their expertise and growth if a large

number of students are often absent. In addition to falling behind in academics, students who do not attend classes regularly are more likely to get into difficulty with their academics and cause problems to their school.

## **1.2 Problem statement**

Based on available information, there is traditional student attendance system in use at Federal Polytechnic, Mubi. Traditional attendance monitoring systems have several limitations, including the following:

- i. Time-consuming: Manual attendance tracking methods are often labor-intensive, requiring staff members to manage registers or sign-in sheets, which can be time-consuming and prone to errors.
- ii. Inaccuracy: Manual systems are susceptible to human error, such as misinterpretation of handwriting or accidental omissions, leading to inaccuracies in attendance records.
- iii. Lack of real-time data: Traditional systems do not provide real-time attendance data, making it difficult for institutions to track attendance trends or identify patterns in attendance behavior.
- iv. Security concerns: Manual systems are vulnerable to unauthorized access or fraudulent entries, as paper-based records can be manipulated or forged.

To address these challenges, implementing an Attendance Monitoring System using QR Code can offer a reliable, efficient, and secure solution for attendance management.

## **1.3 Aim and Objectives**

The aim of this project is to develop a Quick Response (QR) Code Attendance system for monitoring and taking of student attendance. The objectives are listed as below:

- i. To store, access and manage student attendance data for every lecture taken.
- ii. To develop a system where all student attendance data will be stored and managed.
- iii. To develop a system that will be saving attendance records into the system will be more secured as compared to paper-based records.

## **1.4 Significance of the Study**

The System also allows the departmental management to track or investigate student class attendance in a particular course having poor attendance thereby enabling the department to rectify the situation by providing the necessary interventions. The system provides high level of security whereby making it impossible for imposters and impersonators in making their ways to examination halls.

## **1.5 Scope of the Study**

This project focuses on developing an Attendance Monitoring System using QR Code specifically tailored for Computer Science Department. This Software is mainly focused and only accommodates the computerized attendance exercise due to the time and resource constraint for Computer Science

Department, of Federal Polytechnic, Mubi. This Software is limited in eliminating the manual procedure involved in recording attendance.

## **1.6 Definition of Some Operational terms**

**Attendance:** The act or state of going regularly to or being present at a place or event. Operationally, attendance refers to the number of students and teachers that are present (Shehu, 2010).

**Authentication:** Authentication is the process of determining whether someone or something is, in fact, who or what It declared to be (Romil, 2015).

**Automation.** the technique, method, or system of operating or controlling a process by highly automatic means, as by electronic devices, reducing human intervention to a minimum (Merriam Webster, 2021).

**Barcode:** A machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information for reading by the camera on a smartphone (Merriam Webster, 2021).

**Database:** is a collection of information that is coordinated so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content (Kathuria, 2014).

**Information System.** is any organized system for the collection, organization, storage, and communication of information. Operationally, the information system refers to all the manual and computer-based application systems of the attendance monitoring system (Geeta, 2013).

**Monitoring:** To observe and check the progress or quality of (something) over a period of time (Merriam Webster, 2021).

**MySQL:** is an open-source relational database management system (Wikipedia, 2016).

**Report:** This contains the record of an/or employees (Merriam-Webster, 2013).

**Scanner:** a device for examining, reading, or monitoring something in particular (Merriam-Webster, 2013).

**Software:** These are set of logically related instructions given to the computer to perform some specific tasks (Merriam-Webster, 2013).

**System:** This is any collection of components that work together to perform a task (Butler, 2017).

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents a comprehensive review of the existing literature on attendance monitoring systems, QR code technology, and relevant theoretical frameworks. The literature review provides a foundation for understanding the key concepts, theories, and technologies related to the development and implementation of an Attendance Monitoring System using QR Code.

#### **2.2 Attendance Monitoring Systems**

Attendance monitoring systems have been widely studied and implemented in various educational and professional settings. These systems aim to automate the process of recording and tracking attendance, offering numerous benefits over traditional manual methods.

According to Raja et al. (2017), automated attendance monitoring systems reduce administrative workload, eliminate manual data entry errors, and provide real-time access to attendance data. They mention that these systems often utilize biometric, RFID, or barcode technologies for identification and data capture.

Saini and Sharma (2018) discuss the importance of accurate attendance tracking and its impact on educational institutions. They emphasize that automated systems help institutions in identifying attendance patterns, monitoring student performance, and improving overall efficiency.

##### **2.2.1 Biometric Attendance Systems**

Biometric attendance systems utilize unique physiological or behavioral characteristics, such as fingerprints, facial recognition, or iris scans, for identification and attendance tracking. These systems offer high accuracy and reliability in recording attendance.

According to Kumar et al. (2019), biometric attendance systems have gained popularity due to their ability to eliminate proxy attendance, reduce time spent on manual record-keeping, and provide real-time data access. The study highlights that biometric systems ensure the integrity of attendance records and enhance overall efficiency.

##### **2.2.2 RFID-Based Attendance Systems**

Radio Frequency Identification (RFID) technology is widely employed in attendance monitoring systems. RFID tags or cards are issued to individuals, and attendance is recorded when these tags are detected by RFID readers placed at strategic locations.

In their study, Kim and Jang (2016) highlight the benefits of RFID-based attendance systems, including ease of use, fast data capture, and real-time monitoring. They emphasize that these systems are particularly suitable for large-scale environments such as universities, where manual attendance tracking becomes challenging.

### **2.2.3 Barcode-Based Attendance Systems**

Barcode-based attendance systems involve the use of barcodes that can be printed on identification cards or generated digitally. Attendance is marked by scanning the barcode using dedicated scanners or smartphone applications.

Nimkar et al. (2020) discuss the advantages of barcode-based attendance systems, such as cost-effectiveness, simplicity, and compatibility with various devices. The study emphasizes that barcode systems offer a practical solution for institutions with limited resources or technological infrastructure.

### **2.2.4 Mobile-Based Attendance Systems**

With the widespread use of smartphones, mobile-based attendance systems have gained popularity. These systems utilize mobile applications that allow individuals to mark their attendance using their smartphones.

Pandey et al. (2018) highlight the convenience and flexibility of mobile-based attendance systems. They mention that these systems enable users to mark attendance from anywhere, eliminating the need for physical attendance terminals. The study suggests that mobile-based systems enhance accessibility and improve user engagement.

### **2.2.5 Cloud-Based Attendance Systems**

Cloud-based attendance systems store attendance data on remote servers, allowing real-time access and data synchronization across multiple devices. These systems offer scalability, data security, and ease of management.

In their research, Kumar and Singh (2017) discuss the advantages of cloud-based attendance systems, such as data redundancy, automatic backups, and seamless integration with other applications. They argue that cloud-based systems provide institutions with a centralized and efficient approach to attendance management.

## **2.3 Information systems in education institutes**

Nowadays information communication technology (ICT) has the important role to increase efficiency in general education institutes in term of information management and communication. Simin, Mojgan, Saedah, and Kalaivani (2013) reviewed the administration and management of ICT application in many education institutes and found that many education institutes use information system in the administration and management of many tasks but not examinee verification task. Electronics school management system (e-SMS) in Macedonia from Majlinda Bekim and Mirlinda (2013), is the information system in school that only focuses on web technology to supports teachers, students and parents to access systems. The examination management system developed by Vasupongayya, Noodam, and Kongyong (2013), focuses on how to manage examinations but does not mention to examinee verification. Shah (2014) surveyed the effects of using ICT in education



institutes and found many institutes focus on the back-office task management more than examination tasks. Shahmir, Hamidi, Bagherzadeh and Salimi (2011) presents role of ICT in the education curriculum, but still doesn't mention examination management tasks.

Sergis, Sholla, Zervas, and Sampson (2014) presents supporting school ICT uptake. Although an examination management system is one kind of information system in education institutes, there are concentrations only on the systems to manage information in the examination while the methodology to verify an examinee is still done by the traditional method such as checking examinee documents or signatures. There is some research into information system to examination management such as Suleiman and Nachandiya1 (2018), which presents the design and implementation of a computer-based testing system that incorporates computers into examination task – the examinee verify process uses user names and passwords to access the system.

Singh and Tiwari (2016), presents the design and implementation of secured computer-based examination system based on B/S Structure which also uses a user name and password to login the system. Fagbola, Adigun and Oke (2013) presents Computer-Based Test (CBT) System for University Academic Enterprise Examination that provides a computer-base for the enterprise of examination which concentrates on managing many tasks in the examination but for the examinee verification task still use the old login method is still used. Most research in the field of examination management is focused on electronic examination (e-test) or online-test such as the Secure E-Exam Management System by Castella-Roca, Herrera-Joancomarti, and Dorca-Josa (2006), which presents how to manage the security for e-learning using cryptographic protocols for the testing process in order to ensure the examinee who have the key, can access the examination and Al-hayek, et al. (2016), presents E-School – School Management System. There are many examples of research that provide information system to make examination management more efficiency in many issues, this paper focuses on the ways to reduce human error in the examinee verification process by developing a software design model to be a framework for every education institute.

## **2.4 QR Code Technology**

QR codes, short for Quick Response codes, are two-dimensional barcodes that consist of a pattern of black squares on a white background. These codes can store a significant amount of information, including text, URLs, contact details, or other data types. QR codes are easily generated and can be scanned using smartphones, tablets, or dedicated QR code readers.

According to Chai et al. (2017), QR codes have become widely adopted due to their versatility, ease of use, and compatibility with mobile devices. They highlight that QR codes offer a practical and convenient means of encoding and decoding information.

## **2.5 Applications of QR Codes**

QR codes find applications in various industries and domains. Their usage spans from marketing and advertising to inventory management and attendance tracking.

Chen et al. (2020) discuss the application of QR codes in attendance management systems. They state that QR codes provide an efficient and secure method for marking attendance, allowing individuals to scan codes using their smartphones and record their presence accurately.

In the study conducted by Chen et al. (2019), QR codes were implemented in a classroom attendance system in a university setting. The research found that the use of QR codes improved the efficiency of attendance recording, reduced errors, and provided real-time data access for teachers and administrators.

Quick Response (QR) codes have gained significant popularity due to their versatility and ease of use. QR codes are two-dimensional barcodes that can store large amounts of information. They can be easily generated and scanned using smartphones or dedicated QR code readers.

According to Bhushan and Kumari (2020), QR code technology has become a practical and cost-effective solution for various applications, including attendance monitoring systems. They highlight the advantages of QR codes, such as high storage capacity, fast scanning, and compatibility with mobile devices.

A study by Tumurkhuyag *et al.* (2021) explores the use of QR codes in educational environments. They discuss how QR codes facilitate efficient data capture, enable real-time tracking, and enhance security in attendance monitoring systems. The study suggests that QR codes offer a user-friendly and reliable method for marking attendance.

## **2.6 Information System**

According to Hevner (2014), Information Systems (IS) are implemented within an organization for the purpose of improving the effectiveness and efficiency of that organization. Two paradigms that characterize much of the research in the IS discipline are behavioral science and design science. The behavioral science paradigm seeks to develop and verify theories that explain or predict human or organizational behavior. The design science paradigm seeks to extend the boundaries of human and organizational capabilities by creating new and innovative artefacts.

These two paradigms are complementary but distinct (March & Smith, 2015). The behavioral science paradigm has its root in natural science research methods. It seeks to develop and justify theories that explain or predict organizational and human phenomena (Hevner, 2014). The design science paradigm has its roots in engineering and the science of the artificial (Simon, 2016). It is fundamentally a problem-solving paradigm and seeks to create innovations that define the ideas, practices, technical capabilities, and products through which the analysis, design, implementation,

management, and use of information systems can be effectively and efficiently accomplished (Denning, 2017).

This project work falls in the realm of the design science due to the problem-solving nature of the work. As the Information System (IS), literature recognizes, while the importance of design is well recognized, designing a useful system is complex. This system is built on the work of the design science paradigm and followed the literature suggested guidelines in (Hevner, 2014).

## **2.7 Related literatures**

There are numerous proposals for Automatic Attendance Management Systems in the literature and in the market. Nowadays, barcodes are frequently used in most industries, supermarkets, and wherever information needs to be read automatically.

Shoewu, Olaniyi, and Lawson (2011) proposed an electronic card-based solution to the lecture attendance problem in higher institutions in the developing countries. This system used a singlechip computer based on subsystems interfaced serially to the serial port of the digital computer. Some of the limitations of this system are that not all computer systems possess serial port.

Mahyidin (2018) also proposed student attendance management system using Radio Frequency Identification (RFID). The system makes use of student card in order to grant or denial the student from taking attendance. This technique also did not identify individual based on who he/she is which therefore, can lead to impersonation.

Victor, Jonathan, Reece, and Lemire (2013) presented a system that is based on student wolf pack club tracking system to improve the process of student wolf pack club ticket distribution for athletic events. This system did not, however, integrate any aspect of student attendance monitoring.

On the other hand, Saraswat and Kumar (2017), proposed fingerprint verification technique in taking attendance. Their proposed system makes use of fingerprint verification by using extraction of minutiae technique and system that automates the whole process of taking attendance.

Xue (2019), discusses a prototype system that uses facial recognition technology to monitor and authenticate user or student for attendance taking. A neural network-based algorithm was implemented to carry out face detection, and an eigen face method was employed to perform facial recognition. The experimental results demonstrate the feasibility of near-real-time continuous user verification for high-level security information systems.

## **2.8 Summary of Literature Review**

This chapter reviewed the existing literature on attendance monitoring systems, QR code technology, and relevant theoretical frameworks. The literature highlighted the advantages of automated systems over manual methods, emphasizing the importance of accuracy, efficiency, and real-time data access. QR codes were identified as a practical and reliable technology for attendance monitoring, offering benefits such as high storage capacity and fast scanning. The theoretical frameworks of TAM and UTAUT were discussed as valuable tools for understanding user acceptance and adoption of technology.

## **CHAPTER THREE**

### **SYSTEM DESIGN AND ANALYSIS**

#### **3.1 Introduction**

This chapter contains the system design, the disadvantages of the existing system, the advantages of the proposed system over the existing system, the system requirements (Hardware and Software), the design and the system architecture.

#### **3.2 Disadvantages of the Existing System**

- i. The existing system involves a tedious process and it is time consuming.
- ii. The result of calculation might go wrong when lecturer missed out some of the data in the attendance record.
- iii. In addition, lecturer needs to manually write all the details about the attendance data to the appropriate documents when needed.

#### **3.3 Advantages of the Proposed System**

The following are the advantages of an Attendance Monitoring system. They include the following:

- i. Accuracy of student attendance.
- ii. Reduce cost of materials usage such as papers and pens.
- iii. Productivity / Efficiency: The time and effort saved combined with data accuracy helps in optimizing the use of resources which lead to increased productivity and improves profits.
- iv. Hassle Free Workflow Management
- v. Real-time tracking
- vi. Security and up to date record.

#### **3.4 The Proposed Method**

The waterfall model is a sequential software development process that follows a linear and structured approach. It consists of several distinct phases, each building upon the outputs of the previous phase. Here is the waterfall model for the proposed Attendance Monitoring System using QR code:

##### **Requirements Gathering and Analysis**

- i. In this phase, the system requirements are collected and analyzed.
- ii. The key stakeholders, such as administrators, teachers, and students, are interviewed to understand their needs and expectations.
- iii. The functional and non-functional requirements for the Attendance Monitoring System are documented and finalized.

## **System Design**

- i. Based on the requirements gathered, the system design phase involves designing the overall system architecture and its components.
- ii. The hardware and software requirements are identified and specified.
- iii. The system architecture, including the database structure, mobile application design, and user interface, is planned.
- iv. Detailed design documents and diagrams, such as flowcharts, ER diagrams, and UI wireframes, are created.

## **Implementation**

- i. The implementation phase involves the actual development of the Attendance Monitoring System.
- ii. The mobile application, QR code generator software, attendance management system, and database are developed based on the design specifications.
- iii. Coding standards and best practices are followed to ensure high-quality code.
- iv. Regular testing and debugging are performed throughout the implementation phase to identify and resolve any issues or bugs.

## **Testing**

- i. Once the implementation phase is complete, thorough testing is conducted to ensure the system functions as expected and meets the defined requirements.
- ii. Different types of testing, including unit testing, integration testing, and system testing, are performed to verify the functionality, performance, and reliability of the system.
- iii. Test cases are executed, and defects are identified and fixed.

## **Maintenance and Support**

- i. After the system is deployed, the maintenance and support phase begins.
- ii. Regular maintenance tasks, including bug fixes, updates, and enhancements, are performed to ensure the system's optimal performance and reliability.
- iii. User feedback is collected, and improvements are made based on user suggestions.
- iv. Technical support is provided to address any issues or questions that arise during system usage.

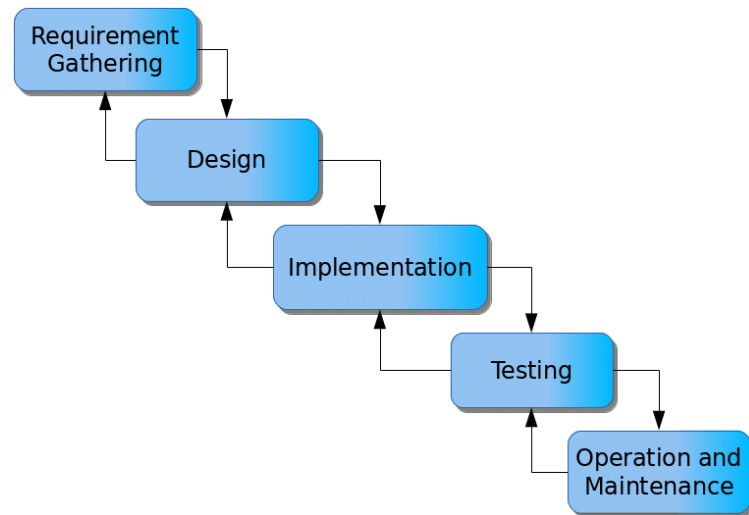


Figure 3.1: Waterfall model

### 3.5 Method of data collection

The data for this study was collected using both primary and secondary data, where staff of the academic registry were interviewed.

### 3.6 System design

#### 3.6.1 Algorithm Diagrams

##### Use case diagram

A use case diagram shows the system and the various ways that they interact with the system.

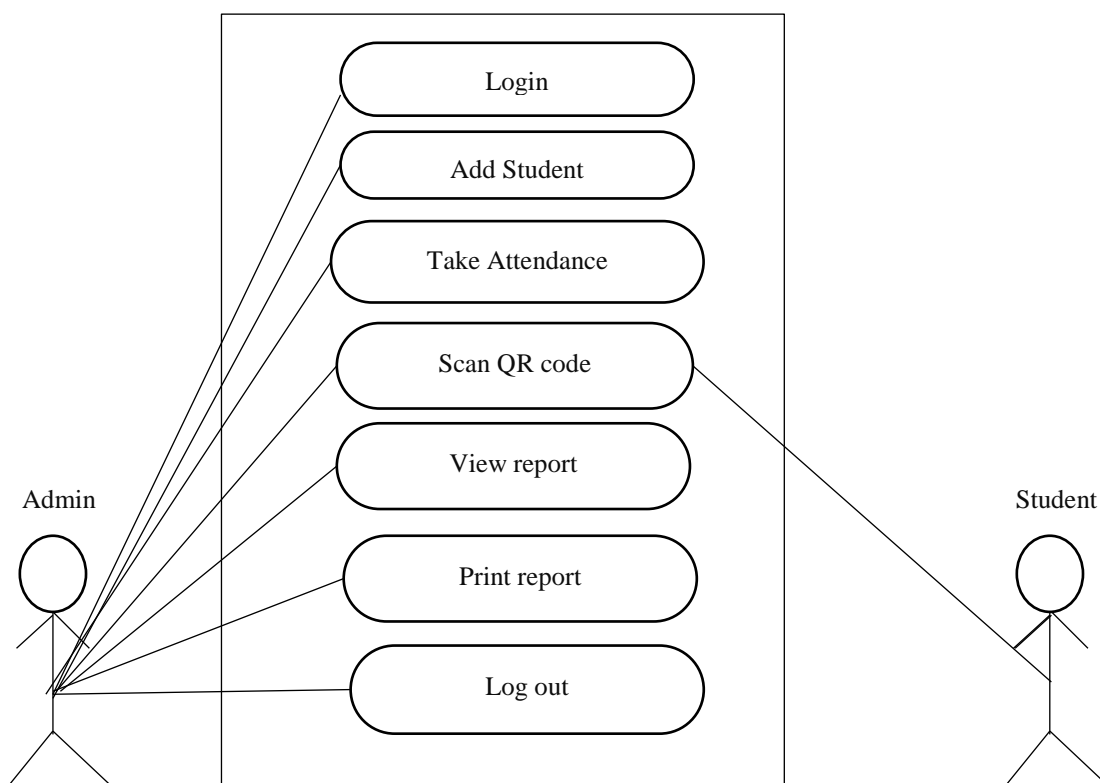


Figure 3.2: Use case diagram

## Class Diagram

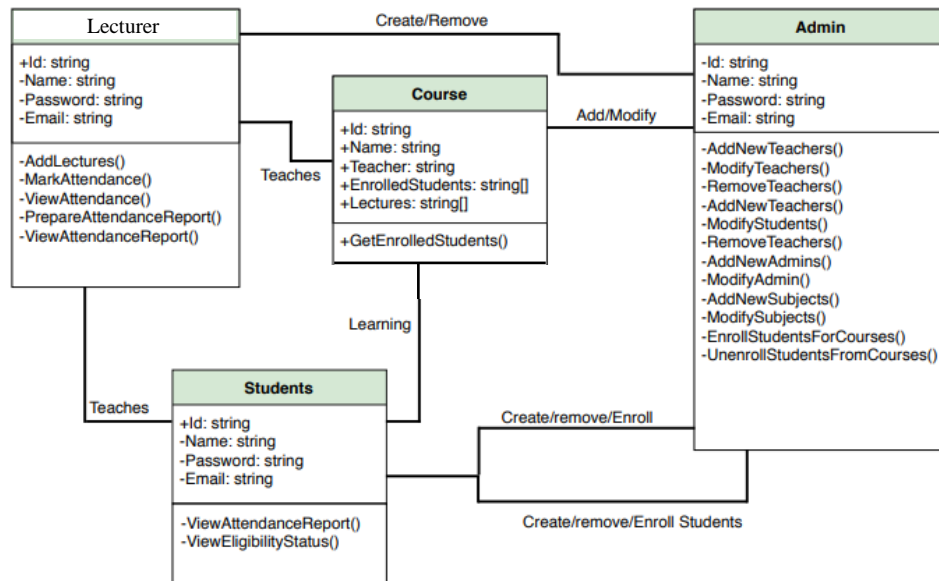


Figure 3.3: Class Diagram

### 3.6.2 System architecture

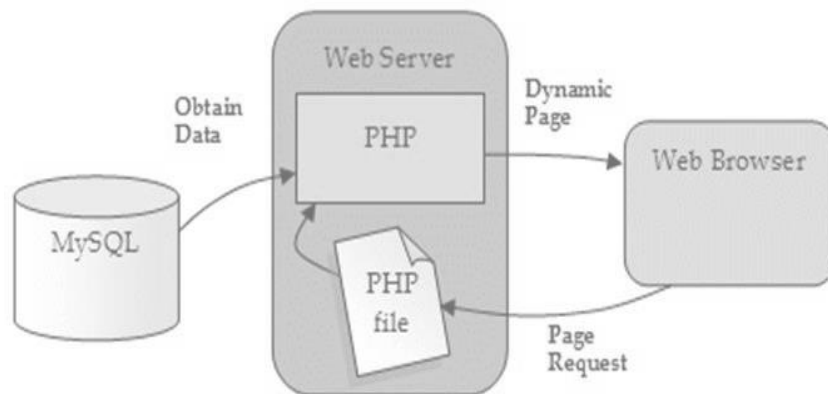


Figure 3.4: System architecture

### 3.6.3 Database Tables/Queries Structures

Table 3.1: Admin Details

Name	Type	Extra
id	int(11)	AUTO_INCREMENT
Name	varchar(50)	
Department	varchar(255)	
EmailId	varchar(50)	
MobNo	bigint(11)	
Password	varchar(50)	



**Table 3.2: Student Attendance**

Name	Type	Extra
id	int(11)	AUTO_INCREMENT
Studentid	varchar(250)	
Timein	Timestap()	
Timeout	Timestap()-	
Logdate	varchar(250)	
Status	varchar(250)	

**Table 3.3: Student Details**

Name	Type	Extra
id	int(11)	AUTO_INCREMENT
Studentid	varchar(250)	
Studentname	varchar(250)	
Age	varchar(250)	
Gender	varchar(250)	
Level	Vacrchar(250)	
Department	varchar(255)	
image	varchar(255)	

#### 3.6.4 Input and Output Design

REGISTRATION

Registration Number

Full Name

Age

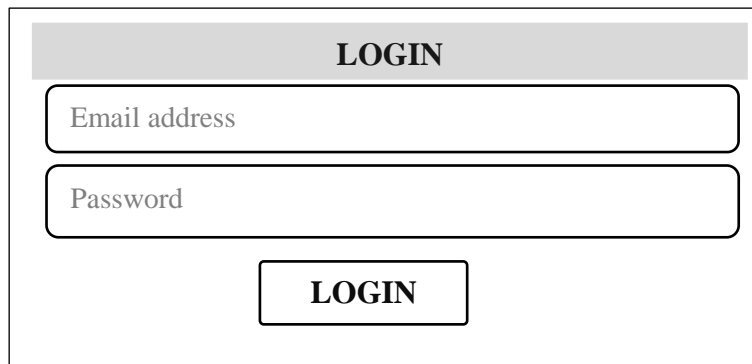
Level

Department

Gender

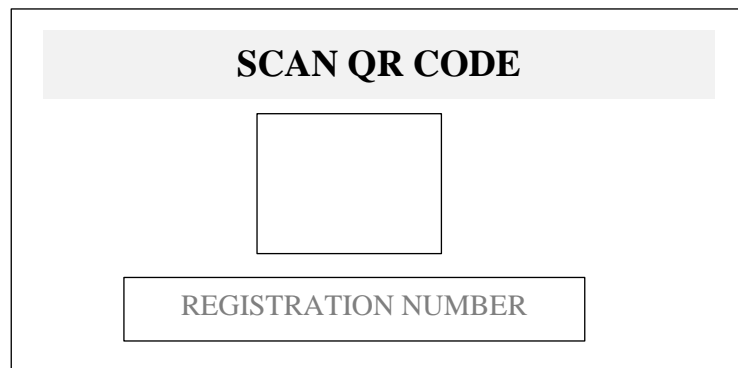
REGISTER

Figure 3.3: Registration Form



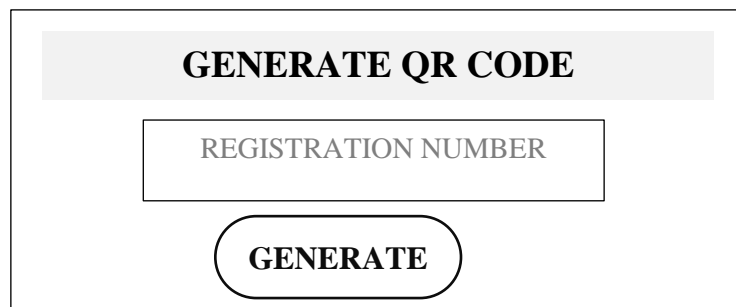
A login form with a grey header bar containing the text **LOGIN**. Below the header are two rounded rectangular input fields: the first is labeled "Email address" and the second is labeled "Password". Below these fields is a rectangular button labeled **LOGIN**.

Figure 3.4: Login form



A form titled **SCAN QR CODE** in a grey header bar. Below the header is a square placeholder for a QR code. Below the QR code placeholder is a rectangular input field labeled "REGISTRATION NUMBER".

Figure 3.5: Scan QR Code



A form titled **GENERATE QR CODE** in a grey header bar. Below the header is a rectangular input field labeled "REGISTRATION NUMBER". Below the input field is a rounded rectangular button labeled **GENERATE**.

Figure 3.6: Generate QR Code

### **3.7 System Requirements Specification**

#### **3.7.1 Hardware Requirements**

The software to be design needs the following hardware for an effective operation of the newly designed system.

- i. A system running on intel, P(R) duo core with higher processor
- ii. The-Random Access Memory (RAM) should be at least 512MB.
- iii. At least 20-GB hard disk.
- iv. A monitor.

#### **3.7.2 Software Requirements**

The software requirements include:

- i. A window 7 or higher version of operating system.
- ii. XAMP or WAMP for Database
- iii. PHP
- iv. MySQL
- v. Browser

#### **3.7.3 Personnel Requirement**

Any computer literate who has a technical knowhow of internet surfing can use the system because it is user friendly.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

The new system is designed using PHP and MySQL programming language for easy Attendances records inserting and updating. This system will help in managing and easily retrieving of Student attendance information from the system for management purposes.

#### 4.2 Results

##### 4.2.1 Welcome interface

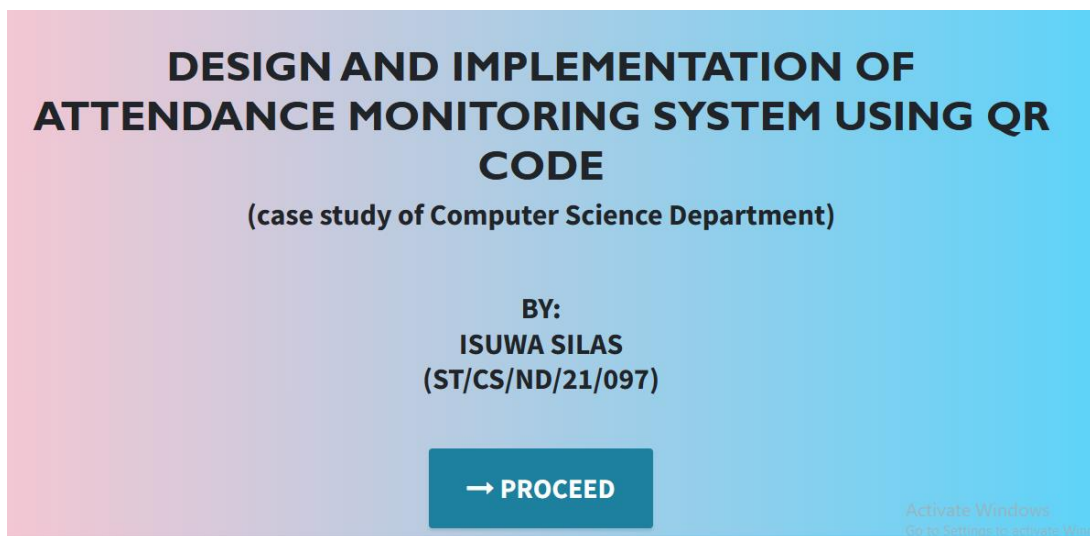


Figure 4.1: Welcome interface

Figure 4.1 shows the Welcome Interface is the landing page of the website. It serves as an introduction to the QR code attendance system and provides a warm welcome to visitors.

##### 4.2.2 Login Interface

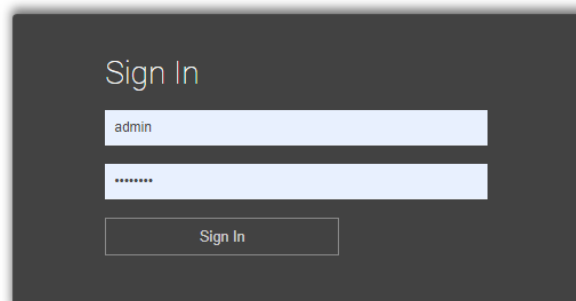
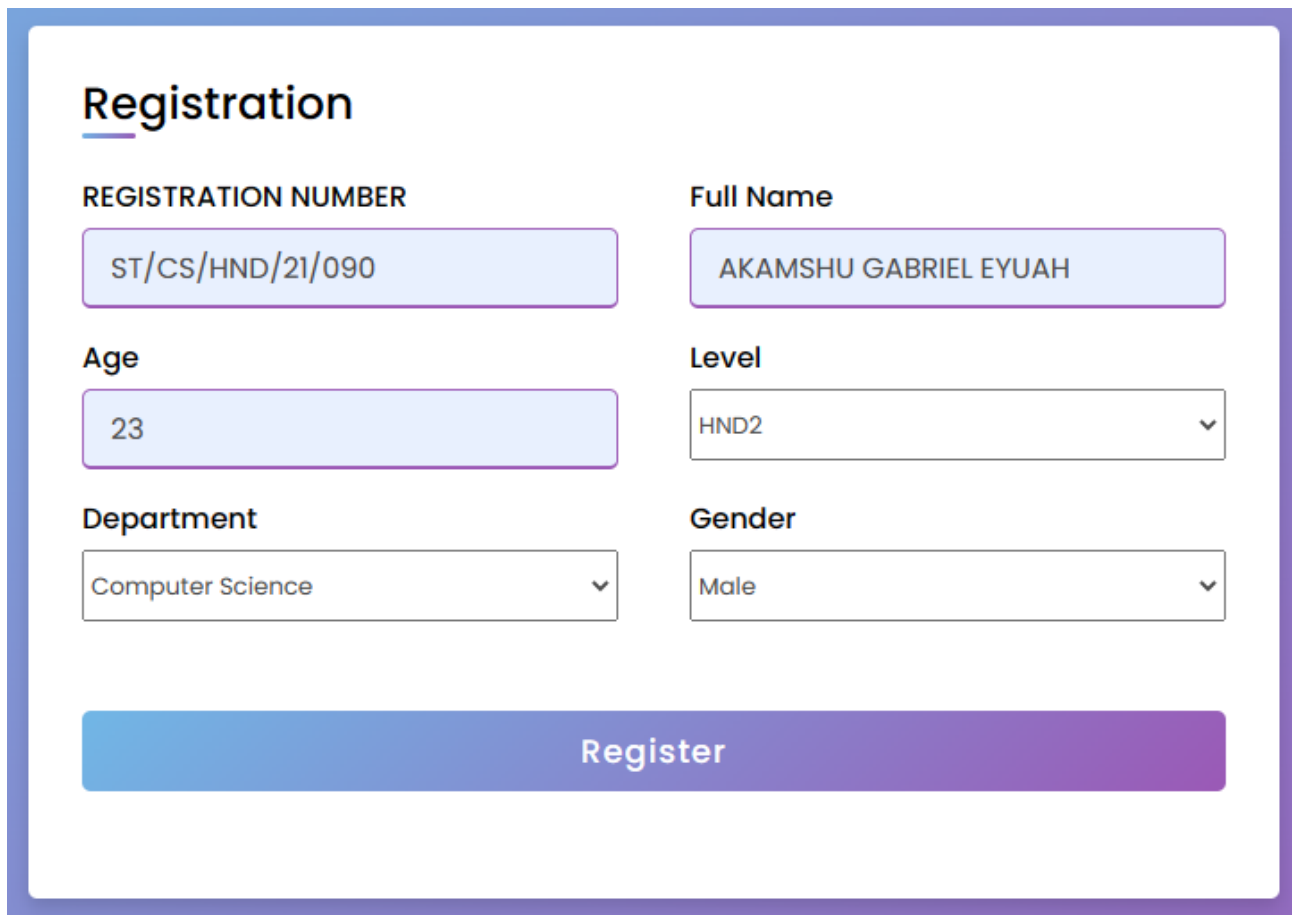


Figure 4.2: Login page interface

Figure 4.2 shows the Login Interface is where authorized administrative staff, can access the system.

### 4.2.3 Add Student interface

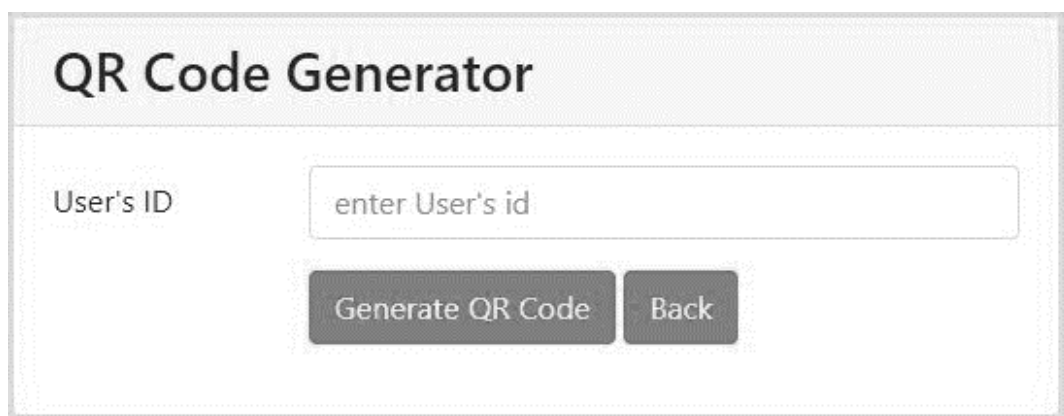


The image shows a web-based registration form titled "Registration". It contains several input fields and dropdown menus. The "REGISTRATION NUMBER" field is filled with "ST/CS/HND/21/090". The "Full Name" field is filled with "AKAMSHU GABRIEL EYUAH". The "Age" field is filled with "23". The "Level" dropdown menu is set to "HND2". The "Department" dropdown menu is set to "Computer Science". The "Gender" dropdown menu is set to "Male". At the bottom of the form is a large blue button labeled "Register".

Figure 4.3: Add Student interface

Figure 4.3 above is a section that allows administrators or authorized personnel to add new students to the system.

### 4.2.4 QR Code Generator interface

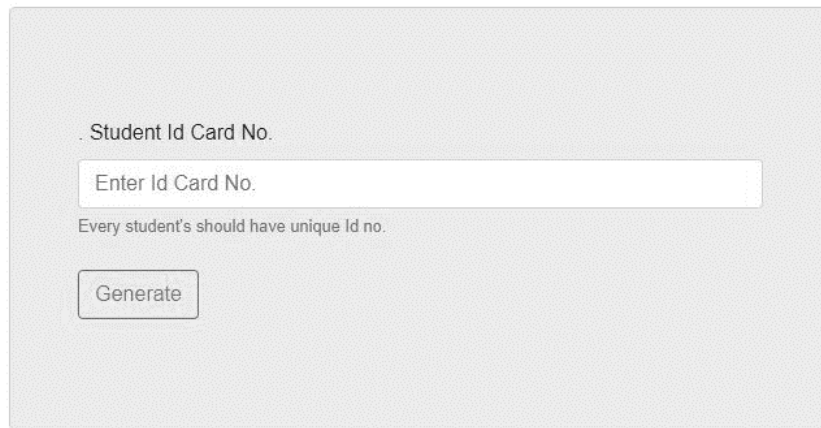


The image shows a web-based QR Code Generator interface. It has a title "QR Code Generator" at the top. Below the title is a label "User's ID" next to a text input field containing the placeholder text "enter User's id". Below the input field are two buttons: "Generate QR Code" and "Back".

Figure 4.4: QR Code Generator Interface

Figure 4.4 shows the QR Code Generator Interface is a vital component of the attendance system. It allows for the generation of unique QR codes for each student.

#### 4.2.5 Identity Card Generator



Student Id Card No.

Enter Id Card No.

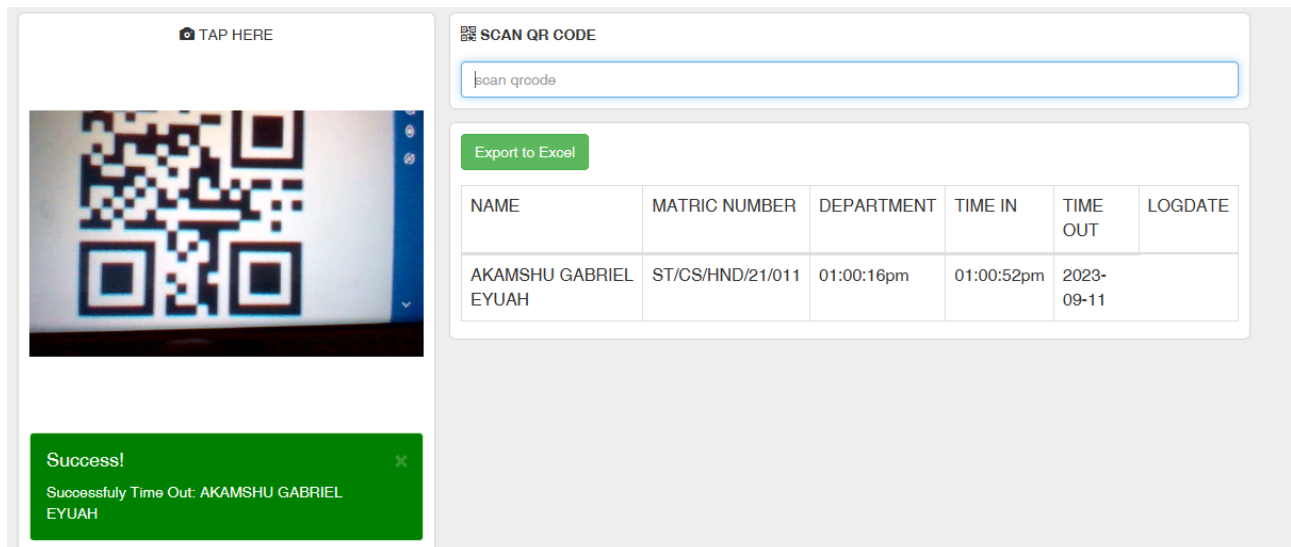
Every student's should have unique Id no.

Generate

Figure 4.5: Identity Card Generator Interface

Figure 4.5 interface is responsible for generating student identity cards with embedded QR codes.

#### 4.2.6 Attendance Interface



TAP HERE

SCAN QR CODE

scan groode

Export to Excel

NAME	MATRIC NUMBER	DEPARTMENT	TIME IN	TIME OUT	LOGDATE
AKAMSHU GABRIEL EYUAH	ST/CS/HND/21/011	01:00:16pm	01:00:52pm	2023-09-11	

Success!

Successfully Time Out: AKAMSHU GABRIEL EYUAH

Figure 4.6: Attendance Interface

Figure 4.6 above shows the Attendance section of the QR code system is a critical component that allows for the efficient and accurate tracking of student attendance within the Computer Science Department.

### 4.3 Discussion

**Welcome Interface:** The Welcome Interface is the landing page of the website. It serves as an introduction to the QR code attendance system and provides a warm welcome to visitors. This section may include a brief overview of the purpose and benefits of the attendance system, enticing users to explore further. Graphics or images related to the Computer Science Department or QR codes could be used to enhance the visual appeal.

**Login Interface:** The Login Interface is where authorized administrative staff, can access the system. Users typically enter their credentials, such as a username and password, to log in securely. Security measures like encryption and two-factor authentication may be implemented to protect user data and system integrity.

**Add Student Interface:** This section allows administrators or authorized personnel to add new students to the system. Users may input student information such as name, ID, and course details. Validation checks can be implemented to ensure accurate data entry.

**QR Code Generator Interface:** The QR Code Generator Interface is a vital component of the attendance system. It allows for the generation of unique QR codes for each student. Users can select a student, specify the date or session, and create a QR code. The QR code contains student-specific attendance information and can be easily scanned during class.

**Identity Card Generator:** This interface is responsible for generating student identity cards with embedded QR codes. Users can select a student, and the system generates a printable identity card. The identity card serves as a physical backup for attendance tracking, ensuring flexibility in recording attendance even without digital devices.

**Attendance Interface:** The Attendance section of the QR code system is a critical component that allows for the efficient and accurate tracking of student attendance within the Computer Science Department. This section is designed to leverage QR codes to streamline the attendance-taking process. This interface includes operations like QR Code Scanning, Student Check-In time, Real-time Data Capture, Accessibility and Convenience, Attendance Reports and Integration with Student Records.

The overarching goal of this website is to streamline and enhance the attendance tracking process within the Computer Science Department using QR codes. Each interface plays a specific role in achieving this objective, from welcoming users to securely managing student data and generating QR

codes for attendance tracking. Effective design and implementation will help improve attendance accuracy and efficiency in the department.

#### **4.4 User manual**

The following are the necessary steps to take in order to use the system efficiently and effectively.

- i. Load the url of the system <https://localhost/attend/> the welcome page will be displayed.
- ii. Click on the Proceed button to proceed to the main system.
- iii. Provide your login details by entering your username and password.
- iv. You will be automatically directed to the dashboard.
- v. The various task that you can perform on the system will be displayed on the sidebar of the dashboard.



## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1 Summary**

In this research project, we embarked on the design and implementation of a QR code attendance system tailored for the Computer Science Department. The primary objective was to streamline attendance tracking processes, enhance accuracy, and improve efficiency in managing attendance records. The system's key components include a Welcome Interface, Login Page Interface, Add Student Interface, QR Code Generator Interface, Identity Card Generator Interface, and QR Attendance Interface.

The Welcome Interface serves as an introduction to the system, providing information about its purpose and benefits. The Login Page Interface ensures secure access for authorized users, while the Add Student Interface simplifies the process of adding new students to the system. The QR Code Generator Interface allows for the creation of unique QR codes for each class session, and the Identity Card Generator Interface provides a physical backup for attendance tracking.

The QR Attendance Interface is the practical implementation of the system, enabling students to mark their attendance by scanning QR codes during classes, offering convenience and efficiency. The system collects real-time data, generates attendance reports, and integrates seamlessly with student records.

#### **5.2 Conclusion**

In conclusion, the design and implementation of the QR code attendance system for the Computer Science Department present a significant advancement in attendance tracking within educational institutions. This system addresses traditional challenges associated with manual attendance taking, such as inaccuracies, time inefficiency, and the potential for proxy attendance.

By leveraging QR code technology, the system provides an efficient and secure method for tracking attendance. Students can check in using their smartphones, eliminating the need for paper sign-in sheets and promoting higher attendance compliance. Real-time data capture and integration with student records offer valuable insights into attendance patterns and academic performance.

The QR code attendance system not only improves administrative efficiency but also enhances the overall educational experience for students and faculty members. It promotes accountability, reduces administrative burdens, and fosters a data-driven approach to academic management. Additionally, it aligns with the growing trend of technology integration in education.

### **5.3 Recommendations**

The researcher puts forward the following recommendations:

- i. The QR code attendance system be used, and lecturers should imbibe the use of this technology in carrying out their attendance in order to reduce the time wastage and easily damages that are involved with the manual system.
- ii. The researchers also recommend that the system be put to effective use in order to derive the necessary efficiency of the system.

### **5.4 Contribution to Knowledge**

The new system was designed in a structured and robust way employing responsive design to it to ensure usability and efficiency. The project research will serve as a reference point for other research work and contribute immensely to knowledge for those conducting a research on similar topic.

### **5.5 Area for further work**

The research work limited in making use of a finger print face recognition technology. Therefore, the researcher suggests that further studies be conducted to include the use of face recognition or finger print technology.

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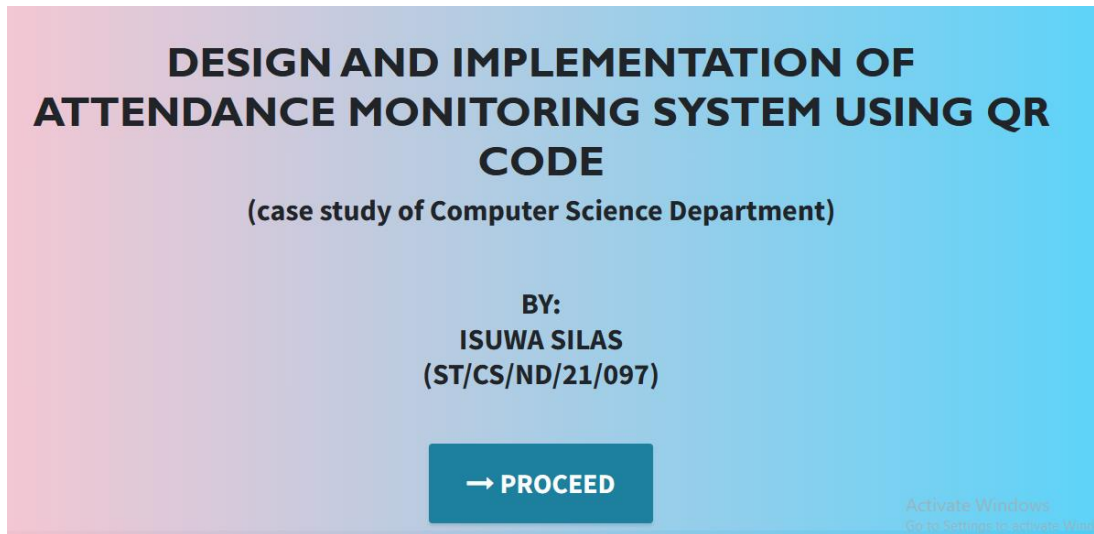
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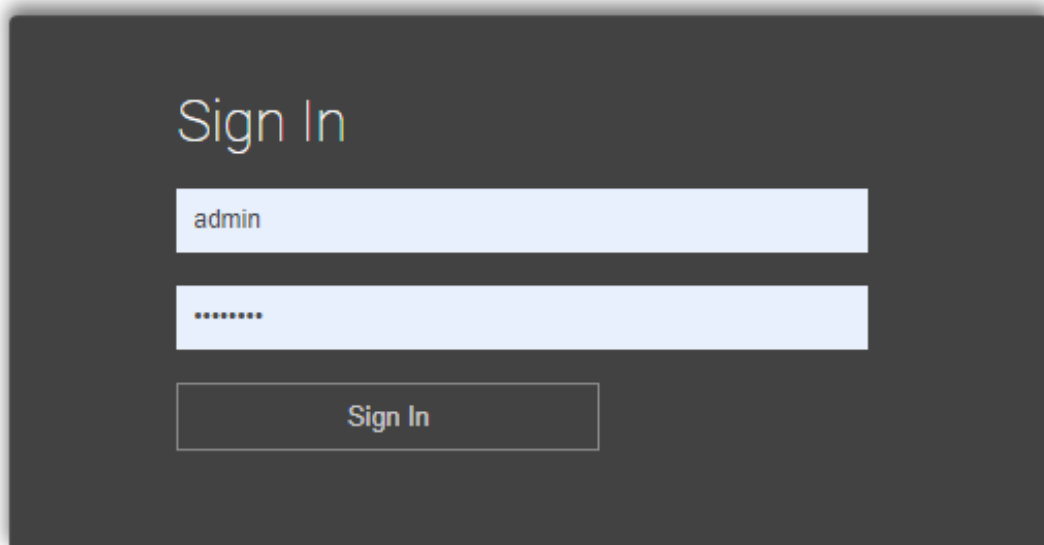
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## APPENDIX A

Welcome interface



Login interface



## Add Student interface

### Registration

REGISTRATION NUMBER	Full Name
<input type="text" value="ST/CS/HND/21/090"/>	<input type="text" value="AKAMSHU GABRIEL EYUAH"/>
Age	Level
<input type="text" value="23"/>	<input type="text" value="HND2"/>
Department	Gender
<input type="text" value="Computer Science"/>	<input type="text" value="Male"/>

Register

## QR Code Generator interface

### QR Code Generator

User's ID

Generate QR Code

Back

## Identity Card Generator

Student Id Card No.

Every student's should have unique Id no.

Generate

## APPENDIX B

### PROGRAM CODE

```
<html>

  <head>
    <input type="hidden" name="type" value="Admin">
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <title>QR Code | Log in</title>
    <!-- Tell the browser to be responsive to screen width -->
    <meta name="viewport" content="width=device-width, initial-scale=1">

    <script type="text/javascript" src="js/instascan.min.js"></script>
    <!-- DataTables -->
    <link rel="stylesheet" href="plugins/datatables-
bs4/css/dataTables.bootstrap4.min.css">
    <link rel="stylesheet" href="plugins/datatables-
responsive/css/responsive.bootstrap4.min.css">
    <link rel="stylesheet" href="css/bootstrap.min.css">
    <style>
    #divvideo{
      box-shadow: 0px 0px 1px 1px rgba(0, 0, 0, 0.1);
    }
  </style>
</head>
<body style="background:#eee">
  <nav class="navbar" style="background:#2c3e50">
    <div class="container-fluid">
      <div class="navbar-header">
        <a class="navbar-brand" href="index.php"> <i class="glyphicon glyphicon-
qr"></i> QR Code Attendance</a>
      </div>
      <ul class="nav navbar-nav">
        <li class="active"><a href="index.php"><span class="glyphicon glyphicon-
home"></span> Home</a></li>

        <li class="dropdown"><a class="dropdown-toggle" data-toggle="dropdown"
href="#"><span class="glyphicon glyphicon-cog"></span> Students <span
class="caret"></span></a>
        <ul class="dropdown-menu">

          <li><a href="add.php"><span class="glyphicon glyphicon-plus-sign"></span>
Add Student</a></li>
          <li><a href="attendance.php"><span class="glyphicon glyphicon-
calendar"></span> Attendance</a></li>
          <li><a href="edit.php"><span class="glyphicon glyphicon-plus-
sign"></span> Users</a></li>
        </ul>
      </li>
    </ul>
  </div>
</body>
</html>
```



```

        </ul>
        </li>
        <li><a href="../card/index.php"><span class="glyphicon glyphicon-
cog"></span> Create ID Card</a></li>

        <!-- <li><a href="#"><span class="glyphicon glyphicon-align-
justify"></span> Reports</a></li> -->
        <!-- <li><a href="#"><span class="glyphicon glyphicon-
time"></span>Students</a></li> -->
        </ul>
        <ul class="nav navbar-nav navbar-right">
            <!--<li><a href="#"><span class="glyphicon glyphicon-user"></span> Sign
Up</a></li>-->
            <!-- <li><a href="#"><span class="glyphicon glyphicon-log-in"></span>
Login</a></li> -->
        </ul>
        </div>
    </nav>
    <div class="container">
        <div class="row">
            <div class="col-md-4" style="padding:10px;background:#fff;border-
radius: 5px;" id="divvideo">
                <center><p class="login-box-msg"> <i class="glyphicon glyphicon-
camera"></i> TAP HERE</p></center>
                <video id="preview" width="100%" height="50%" style="border-
radius:10px;"></video>
                <br>
                <br>

            </div>

            <div class="col-md-8">
                <form action="CheckInOut.php" method="post" class="form-horizontal"
style="border-radius: 5px;padding:10px;background:#fff;" id="divvideo">
                    <i class="glyphicon glyphicon-qr-code"></i> <label>SCAN QR
CODE</label> <p id="time"></p>
                    <input type="text" name="studentID" id="text" placeholder="scan
qr-code" class="form-control" autofocus>
                </form>

                <div style="border-radius: 5px;padding:10px;background:#fff;"
id="divvideo">
                    <form action="excel.php" method="post">
                        <input type="submit" name="export_excel"
class="btn btn-success" value="Export to Excel">
                    </form>

                    <table id="example1" class="table table-bordered">
                        <thead>
                            <tr>
                                <td>NAME</td>

```

```

        <td>MATRIC NUMBER</td>
        <td>DEPARTMENT</td>
        <td>TIME IN</td>
        <td>TIME OUT</td>
        <td>LOGDATE</td>
    </tr>
</thead>
<tbody>
    <tr>
        <td>AKAMSHU GABRIEL EYUAH</td>
        <td>ST/CS/HND/21/011</td>
        <td>Computer Studies</td>
        <td>01:00:16pm</td>
        <td>01:01:07pm</td>
        <td>2023-09-11</td>
    </tr>
    <tr>
        <td>AKAMSHU GABRIEL EYUAH</td>
        <td>ST/CS/HND/21/011</td>
        <td>Computer Studies</td>
        <td>01:01:01pm</td>
        <td>01:01:07pm</td>
        <td>2023-09-11</td>
    </tr>
    <tr>
        <td>AKAMSHU GABRIEL EYUAH</td>
        <td>ST/CS/HND/21/011</td>
        <td>Computer Studies</td>
        <td>01:01:05pm</td>
        <td>01:01:07pm</td>
        <td>2023-09-11</td>
    </tr>
</tbody>
</table>
<script>
    function Export()
    {
        var conf = confirm("Please confirm if you wish to proceed in exporting the
attendance in to Excel File");
        if(conf == true)
        {
            window.open("export.php");
        }
    }
</script>
<script>
    let scanner = new Instascan.Scanner({ video:
document.getElementById('preview')});
    Instascan.Camera.getCameras().then(function(cameras){
        if(cameras.length > 0 ){
            scanner.start(cameras[0]);
        } else{
            alert('No cameras found');
        }
    });
</script>

```

```

        }

    }).catch(function(e) {
        console.error(e);
    });

    scanner.addListener('scan',function(c){
        document.getElementById('text').value=c;
        document.forms[0].submit();
    });
</script>
<script type="text/javascript">
    date_default_timezone_set('Asia/Manila');
var timestamp = '1694416487';
function updateTime(){
    $('#time').html(Date(timestamp));
    timestamp++;
}
$(function(){
    setInterval(updateTime, 1000);
});
</script>
<script src="plugins/jquery/jquery.min.js"></script>
<script src="plugins/bootstrap/js/bootstrap.min.js"></script>
<script src="plugins/datatables/jquery.dataTables.min.js"></script>
<script src="plugins/datatables-bs4/js/dataTables.bootstrap4.min.js"></script>
<script src="plugins/datatables-responsive/js/dataTables.responsive.min.js"></script>
<script src="plugins/datatables-responsive/js/dataTables.responsive.bootstrap4.min.js"></script>

<script>
    $(function () {
        $("#example1").DataTable({
            "responsive": true,
            "autoWidth": false,
        });
        $('#example2').DataTable({
            "paging": true,
            "lengthChange": false,
            "searching": false,
            "ordering": true,
            "info": true,
            "autoWidth": false,
            "responsive": true,
        });
    });
</script>

</body>
</html>

```