TEACHERS RECORD MANAGEMENT SYSTEM (TRMS)

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Database Management) with Honours.

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2024

DECLARATION

I hereby declare that this project report entitled

TEACHERS RECORD MANAGEMENT SYSTEM (TRMS)

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date : 05/09/2024

(NUR AIN ATHIRAH BINTI MOHD HANAFI)

I hereby declare that I have read this project report and found

this project report is sufficient in term of the scope and quality for the award of

Bachelor of [Computer Science (Database Management)] with Honours.

SUPERVISOR : _____ Date : 6 Sept 2024

(TS NOR MAS AINA BINTI MD BOHARI)

DEDICATION

To my beloved family and respected lecturers,

I want to express my deepest gratitude and love for each of you. You have been my pillars of strength and wisdom, guiding me through both the happy moments and the tough times with unwavering support.

To my family, you have been my foundation, my rock, and my constant source of inspiration. Your unconditional love has given me the courage to pursue my dreams and reach for the stars. Your steadfast belief in me has pushed me to overcome obstacles and embrace new opportunities. Thank you for always being there, cheering me on, and reminding me of the importance of perseverance, resilience, and the power of love.

To my respected lecturers, you have shaped my mind, broadened my horizons, and nurtured my thirst for knowledge. Your dedication, expertise, and passion for teaching have ignited a flame within me, driving me to explore the depths of my potential. You have challenged me to think critically, encouraged me to question the world around me, and instilled in me a hunger for lifelong learning. Your guidance and mentorship have been invaluable in shaping my academic and personal growth.

Today, as I stand on the edge of new beginnings, I carry with me the wisdom and values instilled by my family and lecturers. Your unwavering support and belief in me have given me the strength to chase my dreams and embrace the unknown.

This dedication is a testament to the profound impact you have had on my life. I promise to carry your teachings, values, and love with me as I embark on this journey, knowing that I am blessed to have you by my side.

With heartfelt appreciation and boundless love,

Nur Ain Athirah binti Mohd Hanafi.

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I would like to take this moment to sincerely thank everyone who has significantly contributed to my personal and professional growth. Your constant support, guidance, and encouragement have been crucial in shaping me into who I am today.

First and foremost, I want to recognize and commend myself for the dedication, perseverance, and unyielding quest for knowledge that have driven my progress. Through countless hours of hard work and introspection, I have surmounted challenges and expanded my limits, ultimately achieving new milestones.

To my dear family and friends, thank you for being my pillars of strength and unwavering sources of love and support. Your belief in me, even during my moments of self-doubt, has been a consistent source of motivation.

I also want to extend my heartfelt gratitude to my supervisor, Ts. Nor Mas Aina binti Md Bohari, for her invaluable guidance, expertise, and steadfast dedication to my academic and professional growth. Her mentorship and insightful feedback have been crucial in honing my research skills and broadening my outlook.

Additionally, I wish to express my thanks to my evaluator, Dr Nurul Izrin binti Md Saleh, for his time, expertise, and invaluable insights during the evaluation process. His constructive feedback enriched my work and motivated me to strive for excellence.

Finally, I extend my gratitude to all the individuals, mentors, teachers, and colleagues who have contributed to my growth and development in various ways. Your knowledge, inspiration, and collaboration have been pivotal in shaping my professional journey.

With sincere appreciation,

Nur Ain Athirah binti Mohd Hanafi.

ABSTRACT

This project report details the development of the Teachers Record Management System (TRMS), a web-based solution designed to address the inefficiencies of traditional paper-based teacher record management. The system centralizes and digitizes teacher data, enhancing search functionality, improving data accuracy, and increasing accessibility for authorized users. Key features include modules for administrators, teachers, and general users, each tailored to specific needs. Administrators manage teacher records and subjects, teachers update profiles and view absences, and general users search for teachers by name or subject. The TRMS eliminates the inefficiencies of manual record management, ensuring reliable, consistent, and easily accessible information. Developed using PHP, MySQL, and HTML/CSS, the system provides a modern and efficient method for managing teacher records in educational institutions. The implementation of TRMS is expected to improve the efficiency of record management, enhance data accuracy, and support better decision-making within institutions. This system represents a significant improvement over traditional methods, offering a scalable solution that can grow with the institution's needs.

ABSTRAK

Laporan projek ini memperincikan pembangunan Sistem Pengurusan Rekod Guru (TRMS), sebuah penyelesaian berasaskan web yang direka untuk menangani ketidakcekapan dalam pengurusan rekod guru secara tradisional yang menggunakan kertas. Sistem ini memusatkan dan mendigitalkan data guru, meningkatkan fungsi carian, memperbaiki ketepatan data, dan meningkatkan aksesibiliti bagi pengguna yang diberi akses. Ciri-ciri utama termasuk modul untuk pentadbir, guru, dan pengguna umum, masing-masing disesuaikan dengan keperluan khusus. Pentadbir menguruskan rekod guru dan mata pelajaran, guru mengemas kini profil dan melihat kehadiran pelajar, dan pengguna umum mencari guru berdasarkan nama atau subjek. TRMS menghapuskan ketidakcekapan pengurusan rekod manual, memastikan maklumat yang boleh dipercayai, konsisten, dan mudah diakses. Dibangunkan menggunakan PHP, MySQL, dan HTML/CSS, sistem ini menyediakan kaedah moden dan cekap untuk menguruskan rekod guru dalam institusi pendidikan. Pelaksanaan TRMS dijangka dapat meningkatkan kecekapan pengurusan rekod, mempertingkatkan ketepatan data, dan menyokong pembuatan keputusan yang lebih baik dalam institusi. Sistem ini mewakili peningkatan ketara berbanding kaedah tradisional, menawarkan penyelesaian yang boleh berkembang mengikut keperluan institusi.

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LIST OF ABBREVIATIONS

DDL	Data Definition Language
DFD	Data Flow Diagram
ERD	Entity Relational Diagram
GUI	Graphical User Interface
SDLC	Software Development Life Cycle
MySQL	My Structure Query Language
UTeM	Universiti Teknikal Malaysia Melaka
DBMS	Database Management System

CHAPTER 1: INTRODUCTION

1.1 Introduction

The current paper-based system used to manage teacher records is not only inefficient but also outdated. Searching through physical files manually is time-consuming and prone to errors, leading to frequent data inconsistencies and duplications. These challenges pose significant difficulties for schools striving to maintain accurate records and for individuals seeking reliable information about teachers. To address these issues comprehensively, this project proposes the development of a web-based Teachers Record Management System (TRMS). By centralizing and electronically organizing data, the TRMS aims to streamline record management processes. Users will benefit from enhanced search functionalities that allow for quick and precise retrieval of teacher information using various search criteria. Furthermore, the TRMS will eliminate the discrepancies and duplications inherent in manual systems, thereby improving overall data accuracy.

The anticipated outcomes of implementing the TRMS are manifold. Firstly, it is expected to greatly enhance operational efficiency by providing rapid access to up-to-date and reliable teacher records. This efficiency will empower schools and stakeholders to make informed decisions promptly and effectively. Secondly, the centralized nature of the TRMS will reduce data errors and redundancies, fostering a more transparent and reliable system for accessing teacher information. Authorized users will benefit from streamlined access, promoting better collaboration and decision-making across educational settings. Overall, the TRMS represents a significant leap forward from traditional paper-based methods, promising to enhance efficiency, accuracy, and accessibility in managing teacher records.

In conclusion, the development of the TRMS addresses critical shortcomings in current teacher record management practices. By leveraging web-based technology to centralize data and improve search functionalities, this project aims to deliver a robust solution that meets the diverse needs of educational institutions and stakeholders.

Through enhanced efficiency, accuracy, and transparency, the TRMS is poised to set a new standard in teacher record management, facilitating smoother operations and informed decision-making within educational environments.

1.2 Problem Statements

i. The current paper-based system requires extensive time and effort to locate specific teacher information stored in physical files. This inefficiency not only delays critical decision-making processes but also consumes valuable administrative resources. Educators and administrative staff often face challenges in swiftly retrieving necessary data, hindering operational efficiency and potentially impacting the quality of educational services provided.

ii. Manual record-keeping practices contribute to data duplication and inconsistencies across various departments and systems within educational institutions. This fragmentation leads to discrepancies in teacher records, such as outdated contact information or conflicting employment histories. These inconsistencies can undermine the integrity of decision-making processes and administrative operations, potentially leading to errors in resource allocation and strategic planning.

iii. The restricted access to teacher records for authorized personnel impedes transparency and effective information sharing within educational settings. This limitation hampers collaboration among stakeholders, such as administrators, educators, and support staff, who require timely access to accurate teacher data for operational and strategic purposes. Moreover, the lack of transparency can hinder efforts to ensure compliance with educational standards and regulatory requirements, impacting overall institutional accountability.

1.3 Objective

i. To develop a centralized, digital system that significantly reduces the time and effort required to locate specific teacher information, thereby improving operational efficiency and supporting timely decision-making processes.

ii. To implement a standardized digital record-keeping system that eliminates data duplication and inconsistencies across departments, ensuring accurate, up-to-date, and reliable teacher records for informed administrative decisions.

iii. To provide authorized personnel with secure, easy access to teacher records, facilitating effective information sharing and collaboration among stakeholders while enhancing compliance with educational standards and regulatory requirements.

1.4 Scope

The scope of the Teachers Record Management System (TRMS) includes functionalities tailored to Admin, Teacher, Users, and Parent roles (refer to **1.4.1**) through specific modules that enable secure access, management of subjects and teachers, profile updates, reviews, and search functionalities as detailed in **1.4.2**.

1.4.1 Users

i. Admin
ii. Teacher
iii. Users
iv. Parent

1.4.2 Modules

i. Admin Module

- Login and Logout Page for Admin: Provides secure access for administrators to the system.

- View Total Number of Subjects and Total Number of Teachers: Allows admins to see comprehensive statistics on subjects and teacher counts.
- Manage Subjects:
  Add Subjects: Enables admins to add new subjects to the system.
  Delete Subjects: Allows admins to remove subjects as needed.
  Add New Teachers: Admins can register and onboard new teachers into the system.
- Manage Details for Teachers:
  Search Teachers: Facilitates searching for specific teachers based on various criteria.
  View Teacher's Data: Provides detailed information about teachers.
  Update Teacher's Profile: Allows admins to modify and update teacher profiles.
  Change Password of Admin: Allows admins to change their login password securely.

ii. Teacher Module

- Login and Logout Page for Teacher: Enables teachers to securely access their accounts.
- Update Profile: Teachers can modify and update their personal and professional information.
- Change Password: Allows teachers to change their login password.
- View Profile: Teachers can view their own profiles to ensure accuracy.
- View Reviews: Provides teachers with feedback and reviews from students or other users.

iii. Users Module

- Search by Subject or Teacher's Name: Allows users (students or other stakeholders) to search for subjects or teachers by name.
- Add Review: Users can provide feedback and reviews on subjects or teachers, contributing to the community's knowledge base and helping others make informed decisions.

1.5 Project Significant

The Teachers Record Management System (TRMS) is designed to revolutionize the management of teacher records through innovative features tailored to enhance educational administrative processes. This system facilitates the centralized storage and organization of critical teacher data, ensuring efficiency and accuracy in record-keeping.

1.6 Expected Outcome

i. Increasing flexibility and convenience, authorized users can see and manage teacher records from any location with an internet connection.
ii. The system is easily scalable without requiring major infrastructure changes in order to handle an increasing volume of data and user base.
iii. Centrally managed updates and maintenance reduce downtime and guarantee that all users have access to the most recent version.

1.7 Conclusion

In conclusion, the Teachers Record Management System (TRMS) marks a transformative step forward in educational administration. By replacing outdated paper-based methods with a centralized, digital solution, TRMS streamlines the management of teacher records, enhancing efficiency and data accuracy. This system not only facilitates quick and reliable access to comprehensive teacher information but also fosters better decision-making and resource allocation within educational institutions.

Looking ahead, Chapter 2 will delve into the methodology and planning aspects of the TRMS development. It will explore the chosen Database Life Cycle (DBLC) methodology, detailing the phases and activities involved in creating the system. This chapter will also outline the project milestones and schedule, providing a clear roadmap for the successful completion of the TRMS, ensuring that each phase is carefully executed to meet the project's objectives.

CHAPTER 2: PROJECT METHODOLOGY AND PLANNING

2.1 Introduction

This chapter outlines the chosen methodology for developing the Teachers Record Management System (TRMS). Various System Development Life Cycle (SDLC) methodologies such as waterfall, agile, and spiral models are available for designing, developing, and testing high-quality software solutions. For this project, the Database Life Cycle (DBLC) methodology has been selected due to its structured approach tailored for database-centric systems. DBLC encompasses phases including database initial study, database design, implementation & loading, training & evaluation, and operations & maintenance. Importantly, DBLC extends beyond implementation to encompass ongoing monitoring, modification, and maintenance, ensuring the longevity and adaptability of the database system throughout its lifecycle.

2.2 Project Methodology

The Teachers Record Management System (TRMS) is a pivotal project within the Faculty of Information and Communication Technology (FICTS) at University Teknikal Malaysia Melaka (UTeM), designed to revolutionize the management of teacher records. TRMS addresses critical challenges prevalent in traditional record-keeping systems, such as data inconsistencies and limited accessibility. To overcome these issues, TRMS adopts the Database Life Cycle (DBLC) methodology can refer **Figure 2.1**, a structured approach that ensures comprehensive development and continuous refinement of the system.

DBLC guides TRMS through essential phases, beginning with a thorough analysis of requirements and feasibility, followed by the design and implementation of a robust database structure. This foundation supports the development of functionalities tailored to the specific needs of managing teacher records efficiently. Training sessions are conducted to familiarize users with TRMS, ensuring effective utilization and maximizing its benefits. Ongoing maintenance and evaluation phases ensure that TRMS remains responsive to evolving educational requirements, thereby

enhancing administrative efficiency, bolstering data integrity, and facilitating informed decision-making processes across the faculty. By embracing DBLC, TRMS aims not only to streamline administrative tasks but also to empower educational institutions with a reliable and scalable solution for teacher record management.

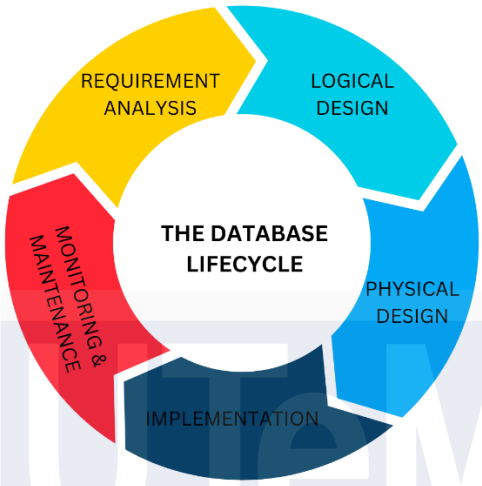

Figure 2.1: DBLC Methodology

2.3 Activities carried out in each phase / stage

The Database Life Cycle (DBLC) methodology for the Teachers Record Management System (TRMS) involves five key phases: Requirement Analysis, Logical Design, Physical Design, Implementation, and Monitoring and Maintenance. Each phase encompasses specific activities tailored to ensure the successful development and deployment of the TRMS.

i. Requirement Analysis

In the Requirement Analysis phase, a comprehensive study is conducted to understand the project requirements and the feasibility of developing the TRMS. This involves engaging with stakeholders such as school administrators, teachers, and IT staff to gather detailed requirements through interviews and surveys ensuring a thorough understanding of current processes and desired functionalities. In order to analyse the

project's technical, financial, and operational viability, a feasibility analysis is carried out. Costs are estimated, the project's possible influence on current processes is evaluated, and available technology is evaluated. Problems with the current paper-based system are clearly defined, and the objectives of the TRMS are identified to set clear project goals. All gathered information is compiled into a detailed requirements document that serves as a reference throughout the project lifecycle.

ii. Logical Design

In the Logical Design phase, the focus is on creating the logical structure of the database to ensure it meets all specified requirements. This includes developing an Entity-Relationship Diagram (ERD) to visually represent data entities, attributes, and relationships, providing a clear understanding of data requirements and structure. The logical schema is defined, specifying tables, fields, data types, and primary and foreign keys, while applying normalization techniques to eliminate data redundancy and ensure data integrity. Additionally, business rules and constraints are established to govern data relationships, ensuring data validity and consistency throughout the database.

iii. Physical Design

In the Physical Design phase, the focus is on determining how the database will be stored, including planning file structures, indexing strategies, and partitioning schemes to optimize performance. The logical schema is then implemented using SQL Server and SQL Workbench, involving the creation of tables, indexes, and constraints through SQL scripts. To ensure efficient data retrieval and storage, performance optimization techniques such as indexing, query optimization, and storage management are applied.

iv. Implementation

In the implementation phase, the database is populated with initial data and the application is developed. This involves migrating existing teacher records from physical files to the new database, including data cleaning to ensure accuracy and consistency. The web-based application is developed, coding both front-end and back-end components, integrating user interfaces, and implementing security features.

System integration ensures all components of the TRMS work seamlessly together, including the integration of the database with the application and other relevant systems.

v. Monitoring and Maintenance

The final phase involves the ongoing maintenance and support of the TRMS, including continuous monitoring of the system's performance and usage, with regular audits to ensure data integrity and reliability. Routine maintenance tasks such as backups and updates are performed to keep the system secure, up-to-date, and efficient. Enhancements are implemented based on user feedback and changing requirements, involving additional development and testing to introduce new functionalities or optimize existing ones. However, it's important to note that the monitoring and maintenance phase was not included in the initial development of this system and will need to be addressed in future iterations or by the institution's IT department to ensure the system's long-term success and sustainability.

2.4 Project Schedule and Monitoring

Project scheduling and monitoring are essential tools for managing the development of the Teachers Record Management System (TRMS). They provide a clear outline of activities to be performed and the time required for each activity. Refer to **Table 2.1** for the project schedule and milestones for the development of TRMS, detailing the activities involved in each phase of the project. Additionally, the Gantt chart in **Table 2.2** visually represents the project timeline and helps track the progress of each activity across weeks, providing an overview of the project's schedule and ensuring that deadlines are met.

Table 2.1: The Project Schedule and Monitoring

Milestones	Expected Document	Expected Outcomes	Date
1. Choose project title and submit the proposal	• Project Title • Project Proposal • Proposal correction • Proposal submission	1.Suggest project title to supervisor. 2.Submit proposal to supervisor for review. 3.Make correction if necessary. 4.Supervisor sign the proposal and submit it to ePSM.	18 March 2024 - 7 April 2024
2. Project introduction and prepare methodology	• Chapter 1 report writing	1.Project background, Problem statement and objective. 2.Module of new system. 3.Projection significance and expected output for the system.	8 April 2024 - 10 April 2024
3. Project introduction and prepare methodology	• Chapter 2 report writing • Chapter 1 & 2 review • Chapter 1 & 2 correction • Project Progress Presentation	1.Choose suitable methodology for the project. For this project, will use DBLC. 2.Project milestones and Gantt chart for the project planning.	11 April 2024 - 14 April 2024

		3. Submit Chapter 1 and 2 to supervisor to review. 4.Make correction if necessary.	
4. Analysis system and database design	• Chapter 3 report writing	1.Flow chart of the new system. 3.List of software and hardware requirements	15 April 2024 - 21 April 2024
5. Analysis system and database design	• Chapter 4 report writing • Chapter 3 & 4 review • Chapter 3 & 4 correction	1. ERD of the new system. 2.Business rules. 3.DataDefinition Language (DDL) and Data Manipulation Language (DML). 4.Normalization and query. 5. Submit Chapter 3 and 4 to supervisor to review. 6.Make correction if necessary.	22 April 2024 - 28 April 2024
6. Implementation	• Implementation • DDL/DML • statements	1.Setup Database. 2.Graphical User Interface (GUI) of the new system. 3.Source code of the new system, create each function module.	29 April 2024 - 26 May 2024

7. Implementation and Testing	• Implementation • Project Progress • Presentation	1.Continue do source code of the new system, create each function module. 2.Test and analysis the system 3.Solve error that get from testing process. 4.Show progress to supervisor.	27 May 2024 - 2 June 2024
8. Submit draft report	• Draft report FYP	1.Submit draft report that include Chapter 1, 2, 3 and 4 to supervisor.	3 June 2024 - 9 June 2024
9.Presentation and final report correction	• Final Project Demo • Final Report	1.Project Demonstration. 2.PSM 1 final report and logbook.	10 June 2024 - 23 June 2024
10.Final report submission	• Final report submission	1.Final Presentation 2.Submit complete final report.	24 June 2024 - 30 June 2024

Table 2.2 Grant Chart

Activities	Weeks														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Choose project title and submit the proposal															
Project introduction and prepare methodology															
Progress 1: Analysis system and database design															
Progress 2: Implementation of module															
Submit draft report															
Presentation															
Final report correction															
Final report submission															

2.5 Conclusion

This chapter elucidates the methodology chosen to steer the system development process, detailing the approach taken, the procedures within each phase of DBLC, and the rationale behind selecting this methodology. DBLC was selected for its structured approach, encompassing six stages: database initial study, database design, implementation & loading, training and evaluation, and operations and maintenance. This methodology ensures a comprehensive lifecycle management from inception to ongoing system operations, facilitating smooth functionality and continuous improvement. A more detailed technical analysis of the entire system will be expounded upon in the subsequent chapter.

Chapter 3 will focus on the analysis phase of the TRMS project. This chapter delves into the current inefficiencies of the manual system, identifying issues such as

data redundancy, lack of centralization, and inadequate access control. It will propose solutions for these problems, including the implementation of a centralized database and automated data management features. The chapter will also cover the requirements for the new system, including both functional and non-functional needs, and provide a detailed flowchart and specifications. By addressing these elements, Chapter 3 aims to establish a clear understanding of the improvements needed and how the new system will enhance the management of teacher records.

CHAPTER 3: ANALYSIS

3.1 Introduction

This chapter discusses the analysis phase of the project focused on the Teachers Record Management System. Analysis is a process that involves separating the whole system into sub-modules, collecting factual data, understanding the processes involved, identifying problems, and recommending feasible suggestions for improving the system.

In 2020, the educational institution recognized the need for an efficient Teachers Record Management System to streamline and optimize the management of teacher-related data. This need arose due to the increasing complexity and volume of records that needed to be maintained, which included personal information, qualification details, subject assignments, student performance data, and attendance records.

Over the years, the existing manual or semi-automated systems were found to be insufficient in meeting the growing demands. Teachers and administrative staff expressed the need for a more robust, centralized, and user-friendly system that could enhance data accuracy, ease of access, and overall efficiency. Thus, in this chapter, the focus will be on understanding the current management processes, identifying the weaknesses, and proposing improvements for a new system that meets user requirements and enhances the overall management of teacher records.

3.2 Problem Analysis

Several issues have been identified in the current system that hinder its efficiency and effectiveness. Firstly, due to the manual nature of data entry and maintenance, there is significant redundancy and inconsistency in records, leading to errors and data discrepancies. Secondly, the absence of a centralized system results in scattered information across various platforms and physical files, making it challenging to access and manage data holistically. Thirdly, manual data entry and cross-referencing are time-consuming, reducing the productivity of teachers and administrative staff. Additionally, physical records and basic digital files lack robust access control and security features, making them vulnerable to unauthorized access and data breaches. Lastly, the current communication methods are fragmented and inefficient, causing delays and miscommunications.

Refer Figure 3.1 a flowchart diagram for a new system.

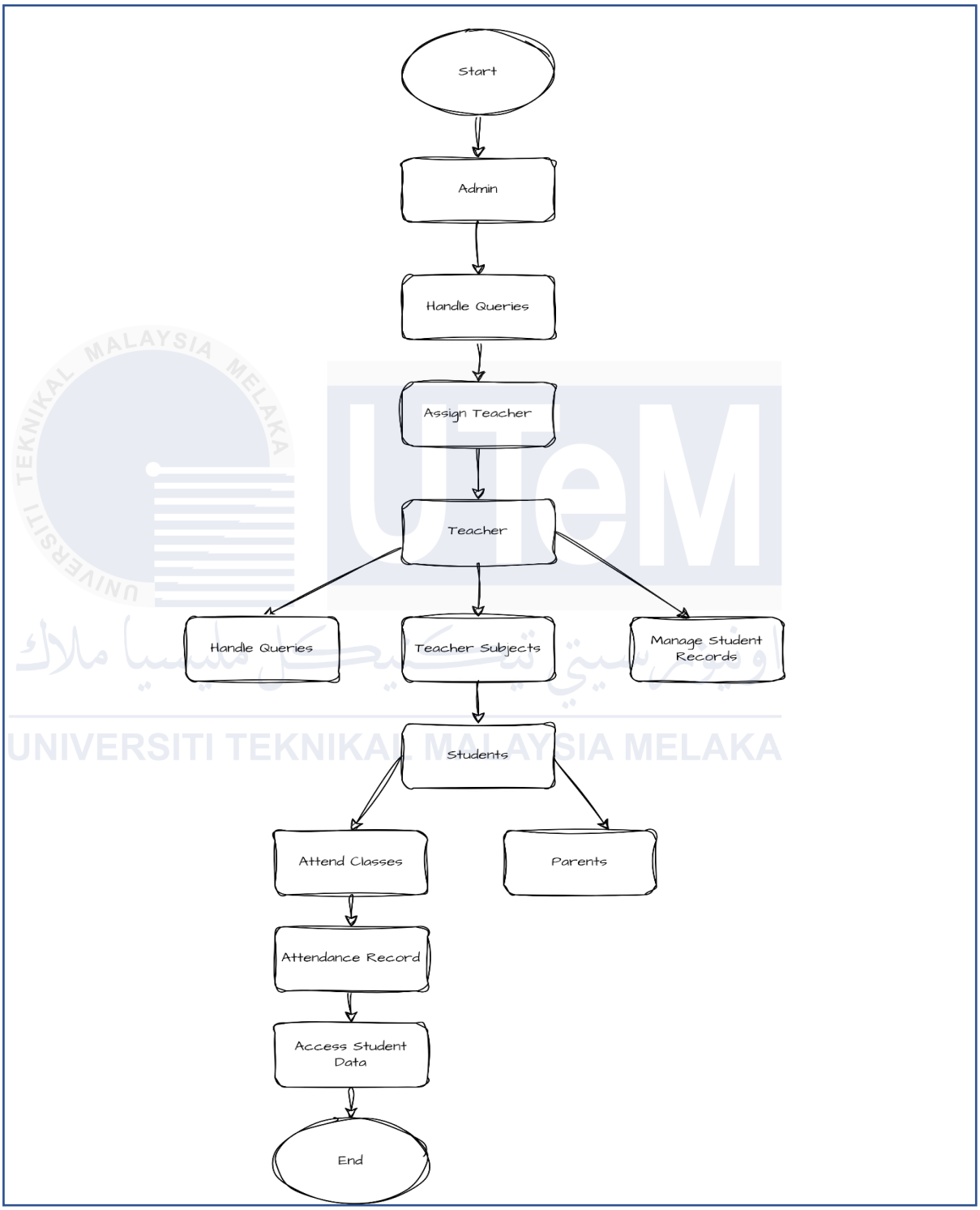

Figure 3.1: Flowchart

3.3 The proposed improvements/ solutions

To address these identified problems and enhance the Teachers Record Management System, several solutions are proposed. Implementing a centralized database to store all teacher-related information will ensure data consistency and reduce redundancy. Introducing automated data entry and validation mechanisms will minimize errors and improve data accuracy. Developing integrated modules for managing personal information, qualifications, subject assignments, student performance, and attendance records will allow seamless data correlation and analysis. Creating a centralized communication platform will facilitate efficient interactions and feedback between teachers, students, and administrative staff. Finally, designing a user-friendly interface will make the system intuitive and easy to navigate, improving the overall user experience for teachers and administrative staff.

3.4 Requirement Analysis of the to-be-System

The requirement analysis outlines the system requirements for each user as well as the functional requirements necessary for the Teachers' Record Management System. Refer **Figure 3.2** to provide a clear understanding of what the new system.

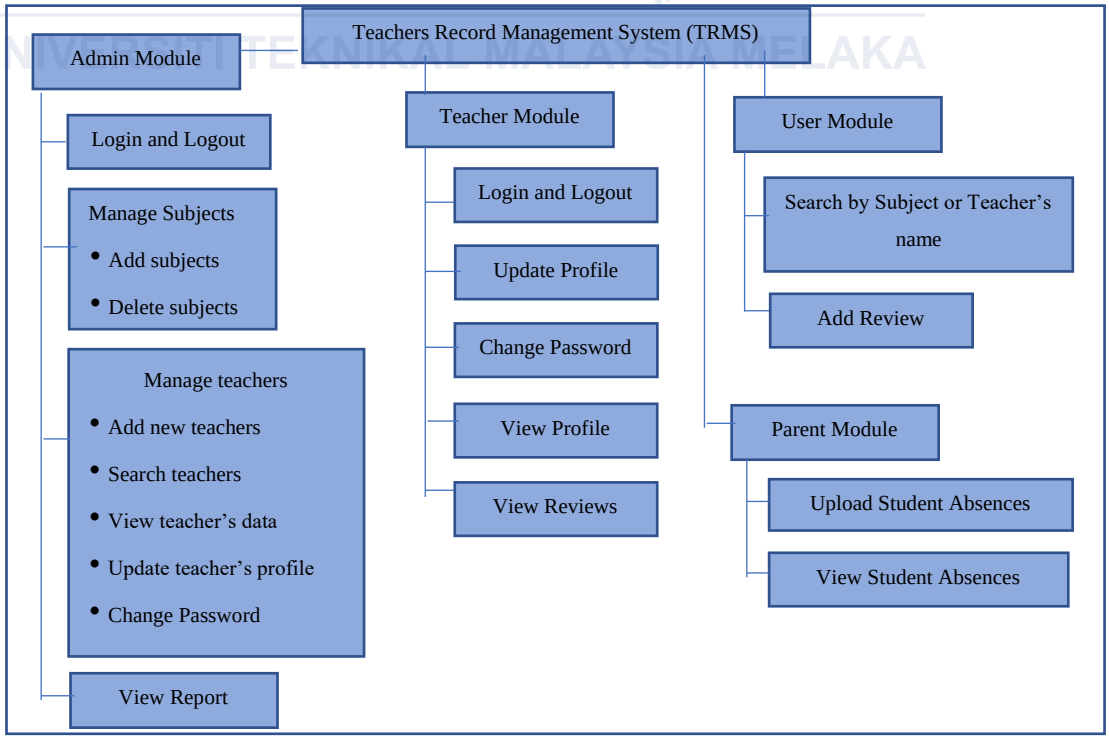

Figure 3.2: Decomposition of New System

3.4.1 Functional Requirements

i. Teachers

- **Manage Personal Information**:

  Teachers can update and manage their personal information such as name, contact details, and address.

- **Qualification Management**:

  Teachers can upload and manage their qualification documents.

- **Subject Assignments**:

  Teachers can view and manage the subjects they are assigned to teach.

- **Communication**:

  Teachers can communicate with students and parents through the system.

- **Feedback**:

  Teachers can receive feedback**.**

ii. Admin

- **Teacher Records Management**:

  Administrative staff can manage the records of all teachers, including personal information, qualifications, and subject assignments.

- **Data Entry**:

  Administrative staff can delete, update and add teacher-related data in the system.

- **Access Control**:

  Administrative can set and manage access control levels for different users.

- **System Maintenance**:

  Administrative staff are responsible for the maintenance and updating of the system.

- **Reporting**:

  Administrative staff can generate various reports related to teacher.

iii. Parents

- **Access to Teacher Information**:

  Parents can access information about teachers, including their qualifications and the subjects they teach.

- **Absent**:

  Parents can view and add student absent data related to the students.

- **Feedback Submission**:

  Parents can submit feedback about teachers.

3.4.1.1 Context Diagram

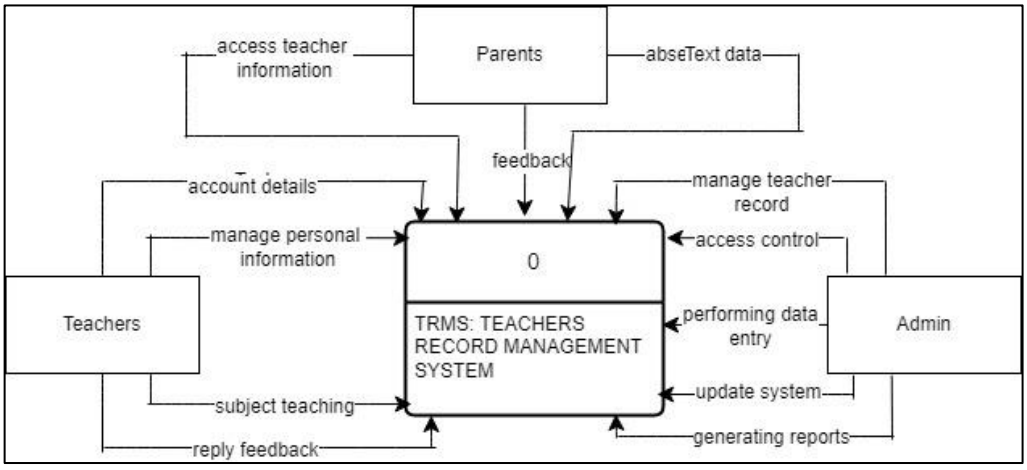

Figure 3.3: Context Diagram

3.4.1.2 DFD (Level 0)

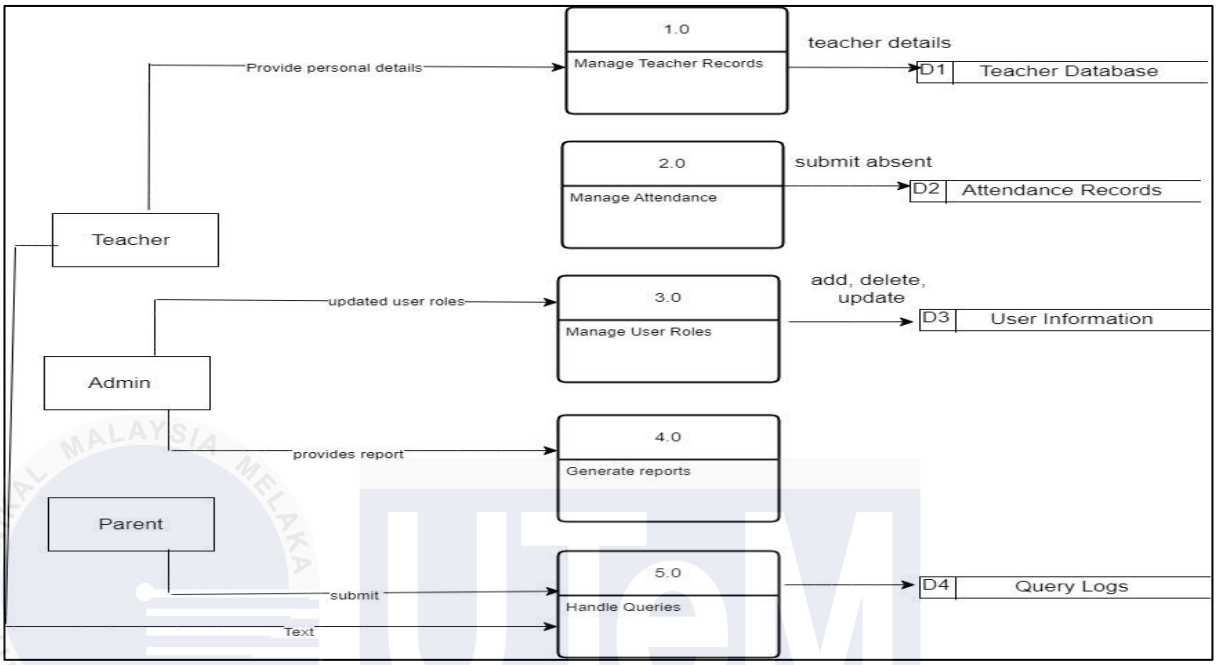

Figure 3.4: DFD Level 0

3.4.1.3 DFD (Level 1)

3.4.1.3.1 Teacher Database

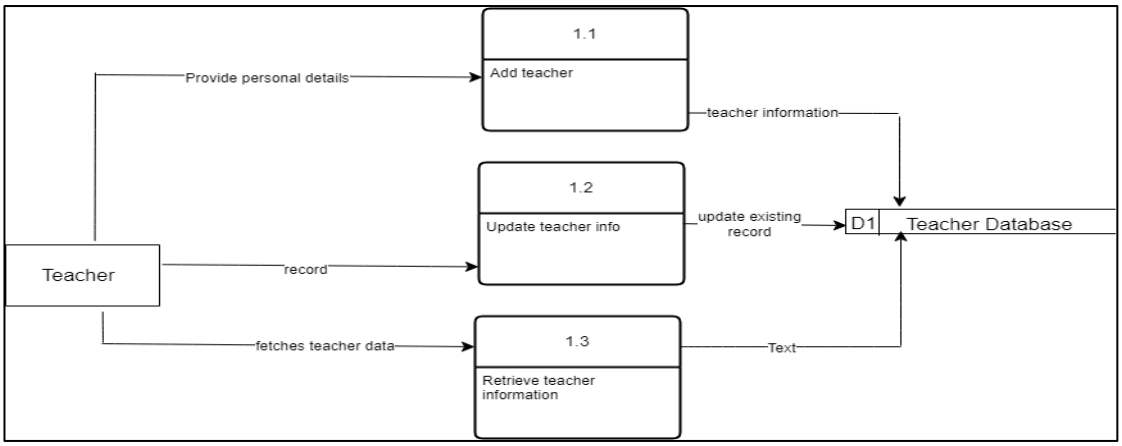

Figure 3.5: DFD Level 1 (Teacher Database)

3.4.1.3.2 Attendance Records

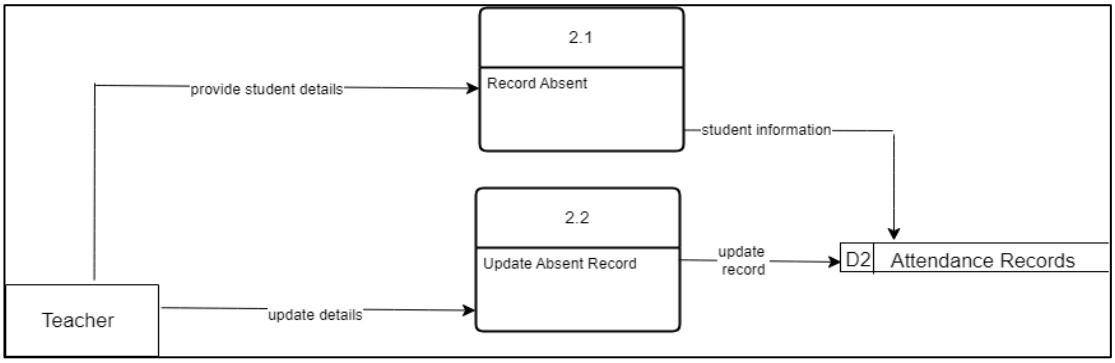

Figure 3.6: DFD Level 1 (Attendance Records)

3.4.1.3.3 User Information

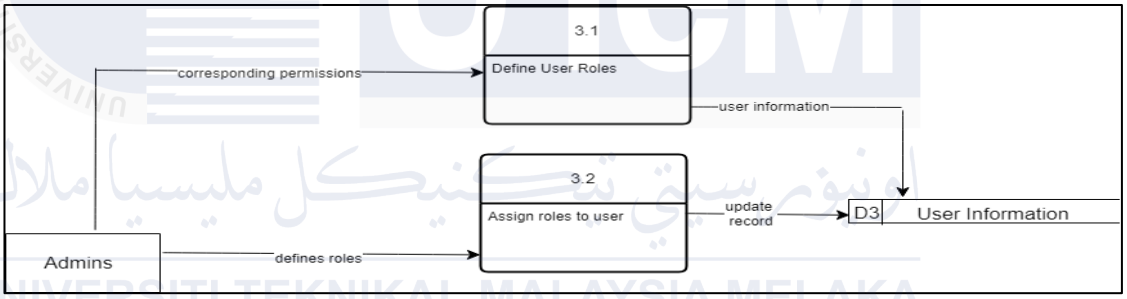

Figure 3.6: DFD Level 1 (User Information)

3.4.1.3.3 Query Logs

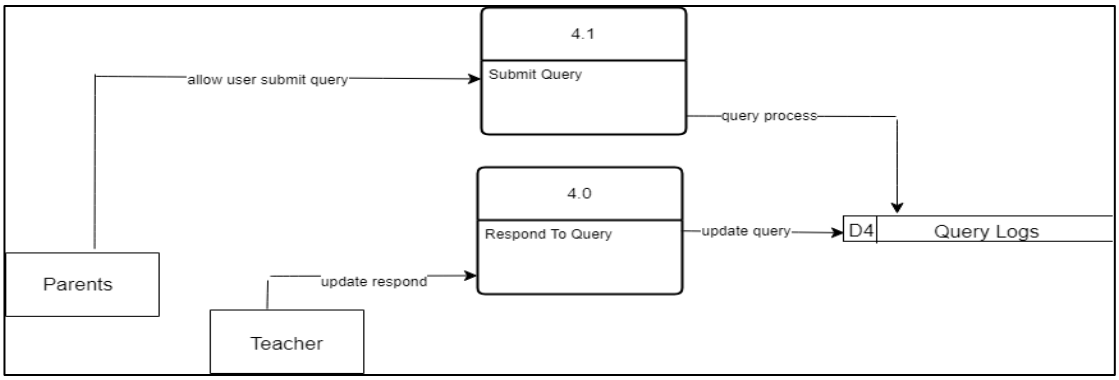

Figure 3.7: DFD Level 1 (Query Logs)

3.4.2 Non-Functional Requirements

i. Security

Identification: The system will only permit access to users who are either teachers, administrators, or parents whose data is already stored in the database and who have successfully registered through the system.

Login: Teacher and admin must log in using their email and password before accessing any features within the system.

Password: Teacher are required to create a password that is at least 8 characters long and includes at least one uppercase letter, one lowercase letter, one numeric digit, and one special character.

ii. Accessibility

- Only registered teachers and administrators can manage teacher-related data within the system.
- Only authorized administrators can add, update, and delete teacher records and manage access controls within the system.

iii. Maintainability

The system should be able to maintain its performance as the number of users (teachers, administrators, and parents) increases. Regular system updates and maintenance checks are necessary to ensure smooth operation.

iv. Usability

Interface: The user interface of the system should be user-friendly, catering to users of varying ages and technical backgrounds. It should be simple, intuitive, and easy to navigate, ensuring that all users, including teachers, administrators, and parents, can effectively perform their tasks. The system will be in English to accommodate the majority of its users.

v. Portability

The system should be compatible with multiple operating systems, including Windows and macOS, to ensure accessibility across various devices.

3.4.3 Other Requirements

Software and Hardware Requirements:

The system's development and operation require specific software and hardware specifications to ensure smooth functionality. These requirements include:

Software: The system should be compatible with modern web browsers: Example: Chrome, Firefox, Safari. SQL Server for database management, and a robust backend framework such as ASP.NET or Node.js.

Hardware: The system should be deployable on servers with adequate processing power, memory, and storage to handle multiple concurrent users and large volumes of data.

3.5 Conclusion

In this chapter, I analysed the Teachers Record Management System, identifying inefficiencies in the current manual processes, such as data redundancy and lack of centralization. We proposed a centralized, automated system with integrated modules for managing personal information, qualifications, subject assignments, absent, and performance tracking. The requirement analysis highlighted the functional and non-functional needs of teachers, administrative staff, students, and parents. Implementing these solutions will enhance efficiency, accuracy, and overall effectiveness in managing teacher-related information, ultimately creating a more organized and efficient educational environment.

Chapter 4 will transition into the design phase, where the focus will be on translating the requirements into a detailed architectural framework for the system. This chapter will explore the design process, starting with the conceptual design to

identify the relationships between entities, followed by logical design to ensure data integrity and optimization, and concluding with the physical design that defines the database structure. Additionally, the chapter will address the design of the graphical user interfaces (GUI), which are tailored to meet the specific needs of different user roles, ensuring intuitive and effective interaction with the system. This phase is crucial for establishing a solid foundation for the implementation of the Teachers Record Management System, ensuring that it meets the identified requirements and functions seamlessly.

CHAPTER 4: DESIGN

4.1 Introduction

In the design phase, the architecture of the Teachers Record Management System is established. The primary goal of this phase is to develop a design that meets the agreed-upon application requirements. The requirements identified during the analysis phase are progressively refined and expanded to encompass all specified functions of the application.

4.2 System Architecture View

The System Architecture View provides a comprehensive overview of the Teachers Record Management System's structure, outlining the interaction between various components, modules, and databases. This architectural framework is designed to ensure that the system operates efficiently and effectively, aligning with the needs of its users, teachers, parents, administrators and students. The architecture is divided into different layers, each responsible for specific functions as shown in **Figure 4.1**.

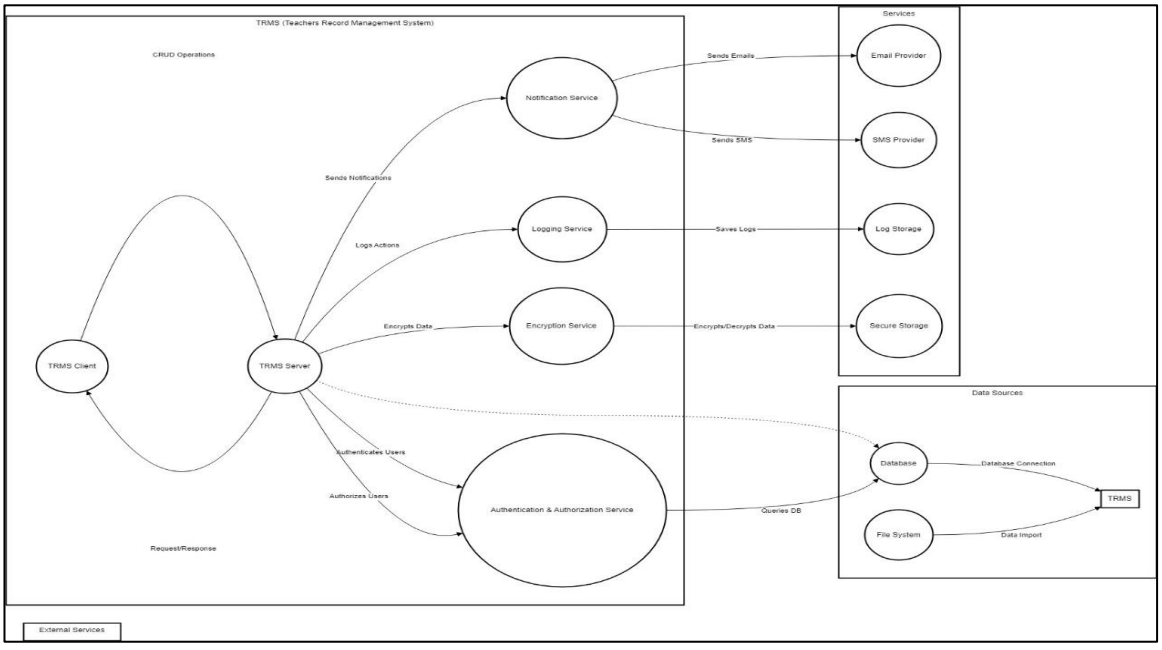

Figure 4.1 System Architecture View

4.3 Database Design

The database design of the Teachers Record Management System is crucial for ensuring efficient data management, integrity, and scalability. This design process is divided into three stages: Conceptual Design, Logical Design, and Physical Design. In the **4.3.1 Conceptual Design** stage, key entities such as admin, teacher, student, subject, query and parent are identified, and their relationships are mapped out using Entity-Relationship Diagrams (ERD). This sets the foundation for data organization. In the **4.3.2 Logical Design** stage involves refining this conceptual model by normalizing data into tables, defining attributes, and establishing primary and foreign keys to ensure minimal redundancy and data integrity. In the **4.3.3 Physical Design** stage translates the logical model into an actual database structure, focusing on performance, storage, and security. This includes choosing a suitable Database Management System (DBMS), creating tables, and setting up constraints, ensuring the database is robust, efficient, and capable of supporting the system's needs.

4.3.1 Conceptual Design

The initial phase in the database design process is conceptual database design. This phase involves identifying key entities, including **Admin**, **Teacher**, **Student**, **Subject**, **Query**, **TeacherSubject** and **Parent**. Each entity plays a vital role. The relationships among these entities are visualized using Entity-Relationship Diagrams (ERD) can refer **Figure 4.2**, which define how entities interact, such as the association of multiple subjects with a teacher or linking students to their parents. This conceptual model provides a comprehensive overview of data flow, ensuring all components are aligned to meet the system's requirements and objectives, laying a solid foundation for subsequent design phases.

4.3.1.1 Entity Relationship Diagram (ERD)

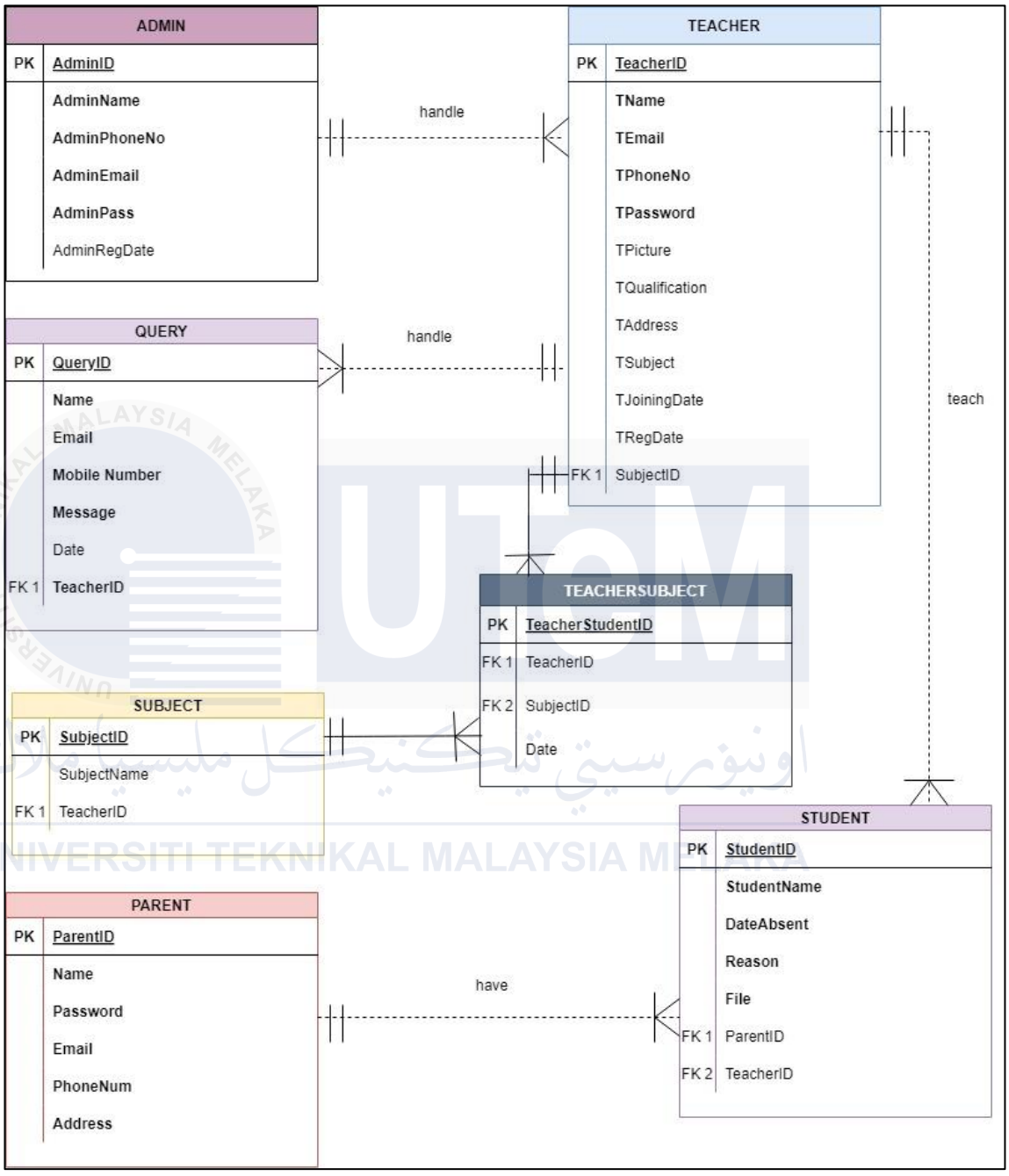

Figure 4.2 Entity Relationship Diagram

4.3.1.2 Business Rule

1. Relationship Type: ADMIN -> TEACHER = 1:1

ADMIN -> TEACHER = 1:1
TEACHER -> ADMIN = M:1

Business Rules:

- Each Admin can manage one or many Teachers.
- Each Teacher is managed by one and only one Admin

2. Relationship Type: ADMIN -> QUERY = 1:1

ADMIN -> QUERY = 1:1
QUERY -> ADMIN = M:1

Business Rules:

- Each Admin can handle one or many Queries.
- Each Query is handled by one and only one Admin

3. Relationship Type: QUERY -> TEACHER = M:1

QUERY -> TEACHER = M:1
TEACHER -> QUERY = 1:1

Business Rules:

- Each Query is directed to one and only one Teacher.

- Each Teacher can receive one or many Queries.

4. Relationship Type: TEACHER -> SUBJECT = 1:1

TEACHER -> SUBJECT = 1:1
SUBJECT -> TEACHER = M:1

Business Rules:

- Each Teacher can teach one or many Subjects.
- Each Subject is taught by one and only one Teacher.

5. Relationship Type: TEACHER -> STUDENT = M:M
(TEACHERSUBJECT Bridge Entity)

TEACHER -> STUDENT = M:M
STUDENT -> TEACHER = M:M

Business Rules:

- Each Teacher can teach many Students, and each Student can be taught by many Teachers.
- This relationship is managed through the TEACHERSUBJECT bridge entity.

6. Relationship Type: TEACHERSUBJECT -> TEACHER = M:1

TEACHERSUBJECT -> TEACHER = M:1

TEACHER -> TEACHERSUBJECT = 1:1

Business Rules:

- Each TEACHERSUBJECT record is associated with one and only one Teacher.
- Each Teacher can have one or many TEACHERSUBJECT records.

7. Relationship Type: TEACHERSUBJECT -> SUBJECT = M:1

TEACHERSUBJECT -> SUBJECT = M:1
SUBJECT -> TEACHERSUBJECT = 1:1

Business Rules:

- Each TEACHERSUBJECT record is associated with one and only one Subject.
- Each Subject can be associated with one or many TEACHERSUBJECT records.

8. Relationship Type: STUDENT -> PARENT = M:1

STUDENT -> PARENT = M:1
PARENT -> STUDENT = 1:1

Business Rules:

- Each Student is associated with one and only one Parent.
- Each Parent can be associated with one or many Students.

4.3.2 Logical Design

The second phase in the database design process is the logical database design. In this phase, the relationships between entities identified in the conceptual design are further refined and validated through normalization. This step ensures that the database structure is optimized for performance and data integrity. The logical design defines the attributes of each entity and establishes the integrity constraints, ensuring that data remains accurate and consistent throughout the system. Relationships are also validated against user transactions to ensure that the design aligns with the system's operational requirements.

4.3.2.1 Data Dictionary

Attributes and entities are subject to integrity constraints, which are detailed at **Table 4.1 until Table 4.6**.

Table 4.1: Data Dictionary of Admin Table

ADMIN								
Bil	**ATTRIBUTE NAME**	**DATA TYPE & SIZE**	**FORMAT**	**RANGE**	**REQUIRED?**	**PK/FK**	**FK REFERENCE TABLE**	**CONTENT**
1.	ID	int(AI)	99999	N/A	YES	PK		Unique id for admin
2.	AdminName	varchar(120)	xxxxx	N/A	YES			Admin's name
3.	UserName	Varchar(120)	xxxxx	N/A	YES			Admin's username
4.	MobileNumber	Int(10)	xxxxx	N/A	YES			Admin's Mobile number
5.	Email	Varchar(120)	xxxxx	N/A	YES			Admin's email
6.	Password	Varchar(200)	xxxx999@	N/A	YES			Admin's password
7.	AdminRegdate	timestamp	xxxx-xxxx 99:99:99	N/A	YES			Admin's Registration Date

Table 4.2: Data Dictionary of Parent Table

PARENT								
Bil	**ATTRIBUTE NAME**	**DATA TYPE & SIZE**	**FORMAT**	**RANGE**	**REQUIRED?**	**PK/FK**	**FK REFERENCE TABLE**	**CONTENT**
1.	ID	int(AI)	99999	N/A	YES	PK		Unique id for parent
2.	username	varchar(255)	xxxxx	N/A	YES			Parent's name
3.	password	Varchar(255)	xxxx999@	N/A	YES			Parent's password
4.	name	Varchart(255)	xxxxx	N/A	YES			Parent's name
5.	MobileNumber	Int(15)	99999	N/A	YES			Parent's Mobile number
6.	Email	Varchar(120)	xxxxx	N/A	YES			Parent's email
7.	Address	Varchar(255)	xxxxx	N/A	YES			Parent's password

Table 4.3: Data Dictionary of Query Table

QUERY								
Bil	**ATTRIBUTE NAME**	**DATA TYPE & SIZE**	**FORMAT**	**RANGE**	**REQUIRED?**	**PK/FK**	**FK REFERENCE TABLE**	**CONTENT**
1.	ID	int(AI)	99999	N/A	YES	PK		Unique id for query
2.	teacherId	Int(AI)	99999	N/A	YES	FK		Teacher's Id
3.	fName	Varchar(200)	xxxxx	N/A	YES			User's name
4.	emailId	Varchart(200)	xxxxx	N/A	YES			User's email
5.	MobileNumber	Int(15)	99999	N/A	YES			User's Mobile number
6.	Query	mediumtext	xxxxx	N/A	YES			User's comment

7.	queryDate	timestamp	xxxx-xxxx 99:99:99	N/A	YES			User's query date

Table 4.4: Data Dictionary of Student Table

STUDENT								
Bil	**ATTRIBUTE NAME**	**DATA TYPE & SIZE**	**FORMAT**	**RANGE**	**REQUIRED?**	**PK/FK**	**FK REFERENCE TABLE**	**CONTENT**
1.	ID	int(AI)	99999	N/A	YES	PK		Unique id for student
2.	ParentID	Int(AI)	99999	N/A	YES	FK		Unique id for parent
3.	TeacherID	Int(AI)	99999	N/A	YES	FK		Unique id for teacher
4.	StudentName	Varchar(255)	xxxxx	N/A	YES			Student's name
5.	DateAbsent	date	9999:99:99	N/A	YES			Student's Date absent
6.	Reason	text	xxxxx	N/A	YES			Student's reason
7.	UploadFile	Varchar(255)	xxxxx	N/A	YES			Student's Upload file absent

Table 4.5: Data Dictionary of Subject Table

STUDENT								
Bil	**ATTRIBUTE NAME**	**DATA TYPE & SIZE**	**FORMAT**	**RANGE**	**REQUIRED?**	**PK/FK**	**FK REFERENCE TABLE**	**CONTENT**
1.	ID	int(AI)	99999	N/A	YES	PK		Unique id for subject
2.	Subject	Varchar(120)	xxxxx	N/A	YES			Subject
3.	CreationDate	timestamp	xxxx-xxxx 99:99:99	N/A	YES			Subject's creation date

Table 4.6: Data Dictionary of Teacher Table

STUDENT								
Bil	**ATTRIBUTE NAME**	**DATA TYPE & SIZE**	**FORMAT**	**RANGE**	**REQUIRED?**	**PK/FK**	**FK REFERENCE TABLE**	**CONTENT**
1.	ID	int(AI)	99999	N/A	YES	PK		Unique id for teacher
2.	Name	Varchar(120)	xxxxx	N/A	YES			Teacher's name
3.	Picture	Varchar(255)	xxxxx	N/A	YES			Teacher's picture
4.	Email	Varchar(120)	xxxxx	N/A	YES			Teacher's email
5.	MobileNumber	Int(15)	99999	N/A	YES			Teacher's mobile number
6.	Password	Varchar(255)	xxxx999@	N/A	YES			Teacher's password
7.	Qualifications	Varchar(120)	xxxxx	N/A	YES			Teacher's qualification
8.	Address	Varchar(200)	xxxxx	N/A	YES			Teacher's address
9.	TeacherSub	Varchar(120)	xxxxx	N/A	YES			Teacher's subject
10.	Description	mediumtext	xxxxx	N/A	YES			Teacher's description
11.	teachingExp	Varchar(10)	xxxxx	N/A	YES			Teacher's teaching experient
12.	JoiningDate	Varchar(120)	xxxxx	N/A	YES			Teacher's joining date
13.	RegDate	timestamp	xxxx-xxxx 99:99:99	N/A	YES			Teacher's registiration date
14.	isPublic	Int(15)	99999	N/A	YES			Teacher's profile public or not
15.	TeacherSub2	Varchar(120)	xxxxx	N/A	YES			Teacher's subject two
16.	TeacherSub3	Varchar(120)	xxxxx	N/A	YES			Teacher's subject three

4.3.2.2 Normalization

This conceptual design is using normalization displayed in **Figure 4.3 until Figure 4.8**. Each table show the third normal form of the normalization because of it in second normal form and there is no transitive function dependency.

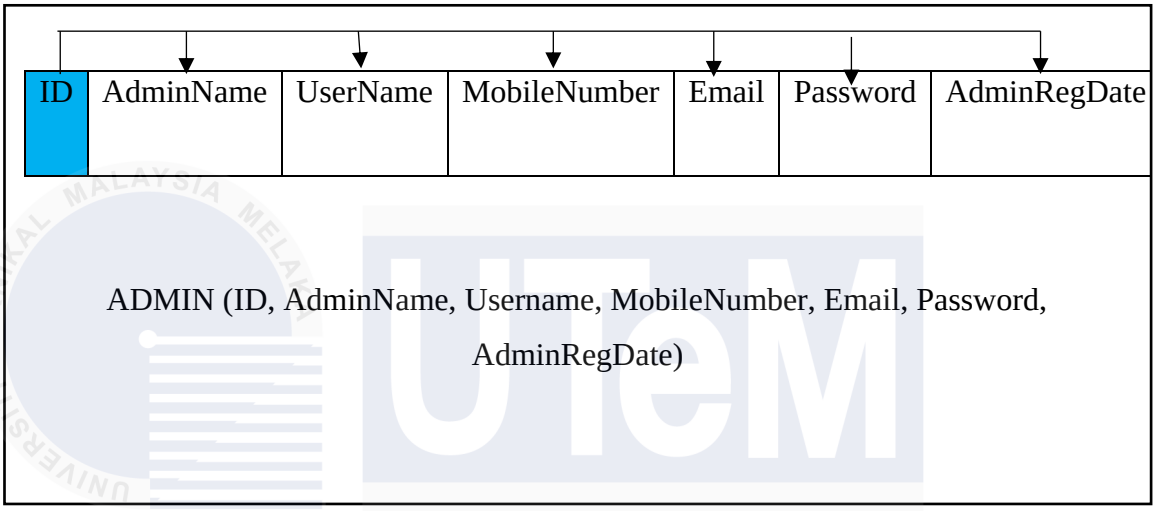

Figure 4.3: Normalization of Admin Table

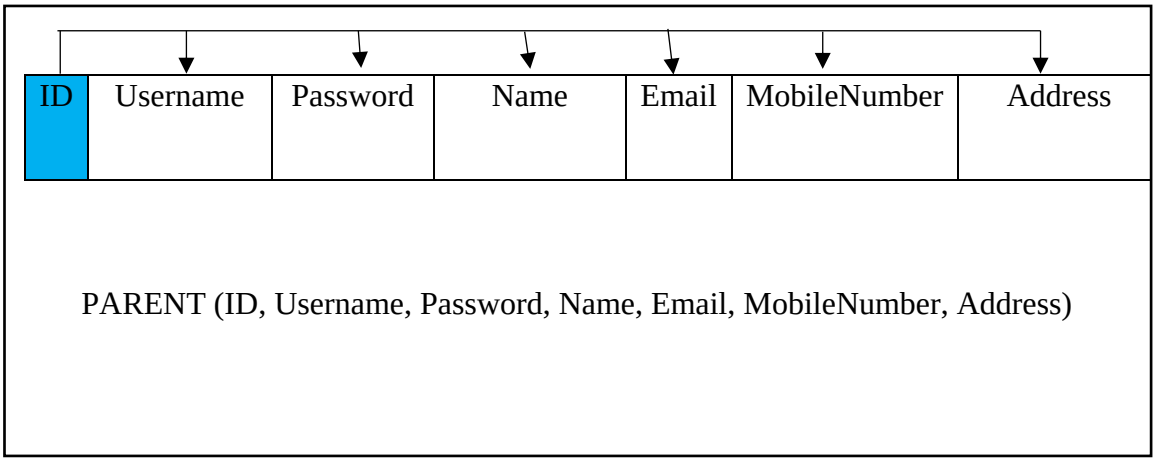

Figure 4.4: Normalization of Parent Table

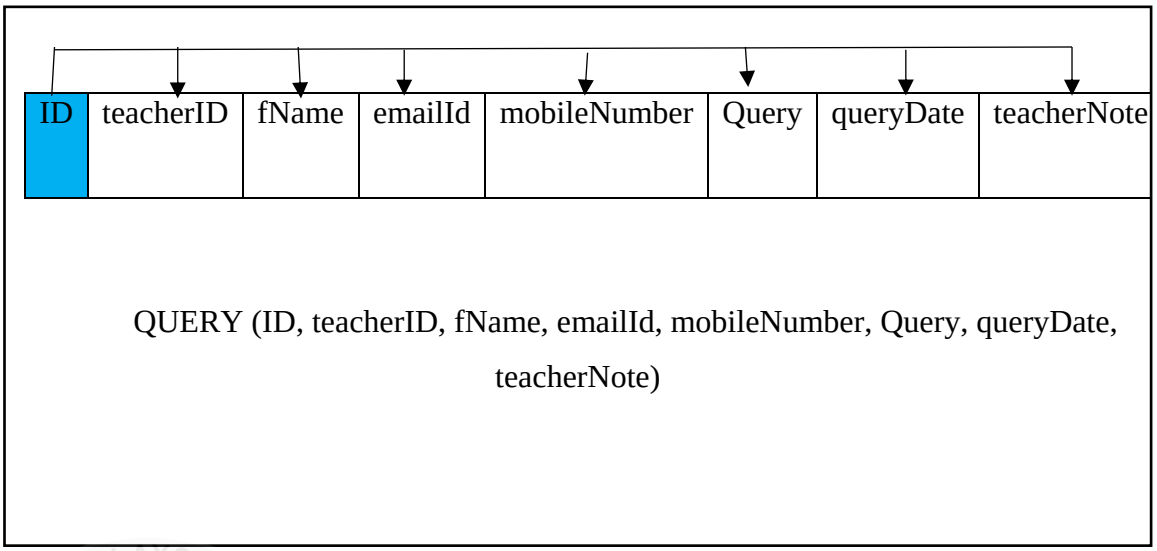

Figure 4.5: Normalization of Query Table

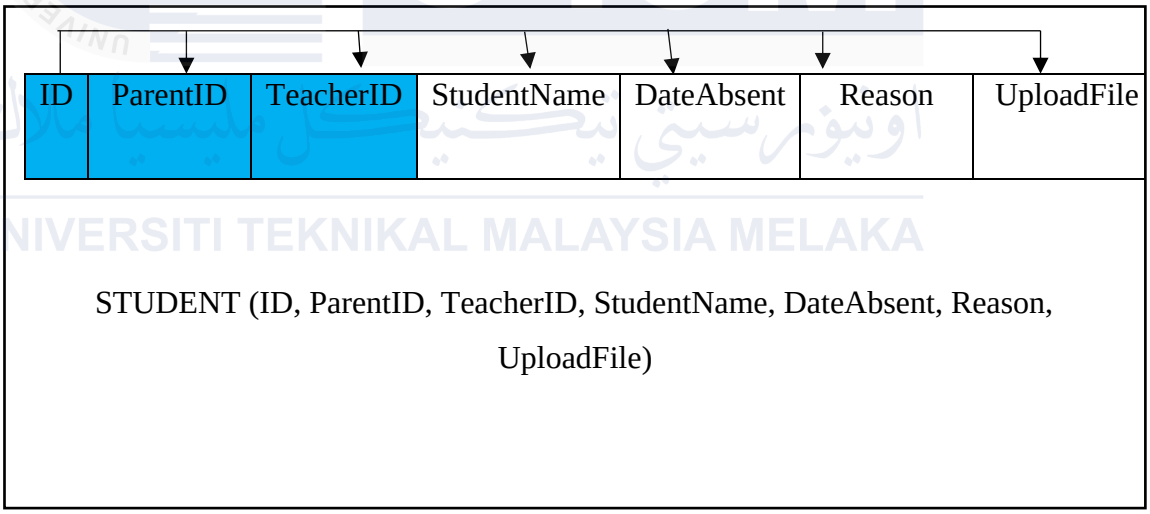

Figure 4.6: Normalization of Student Table

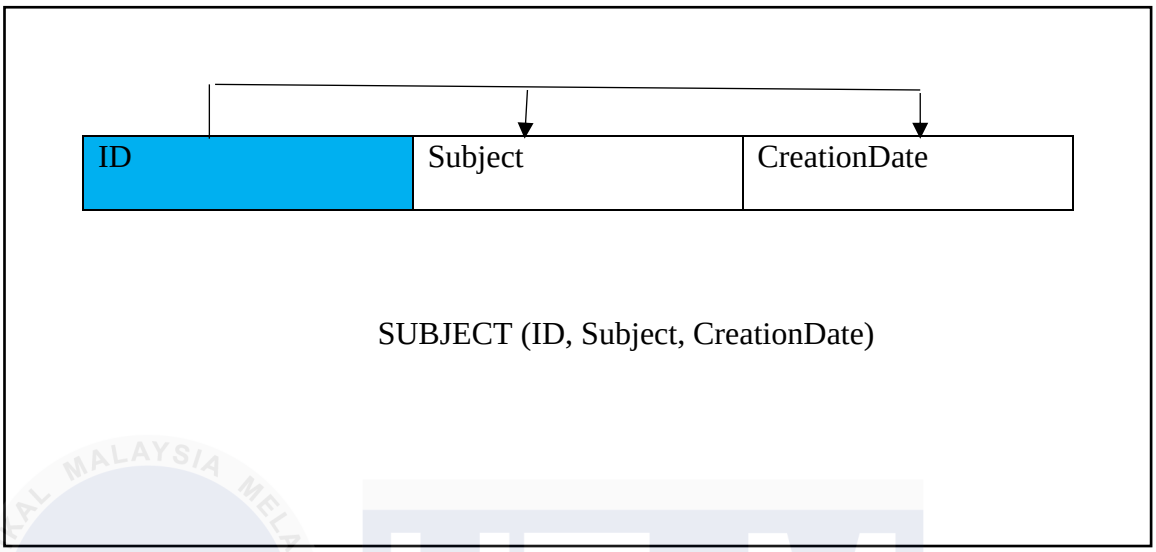

Figure 4.7: Normalization of Subject Table

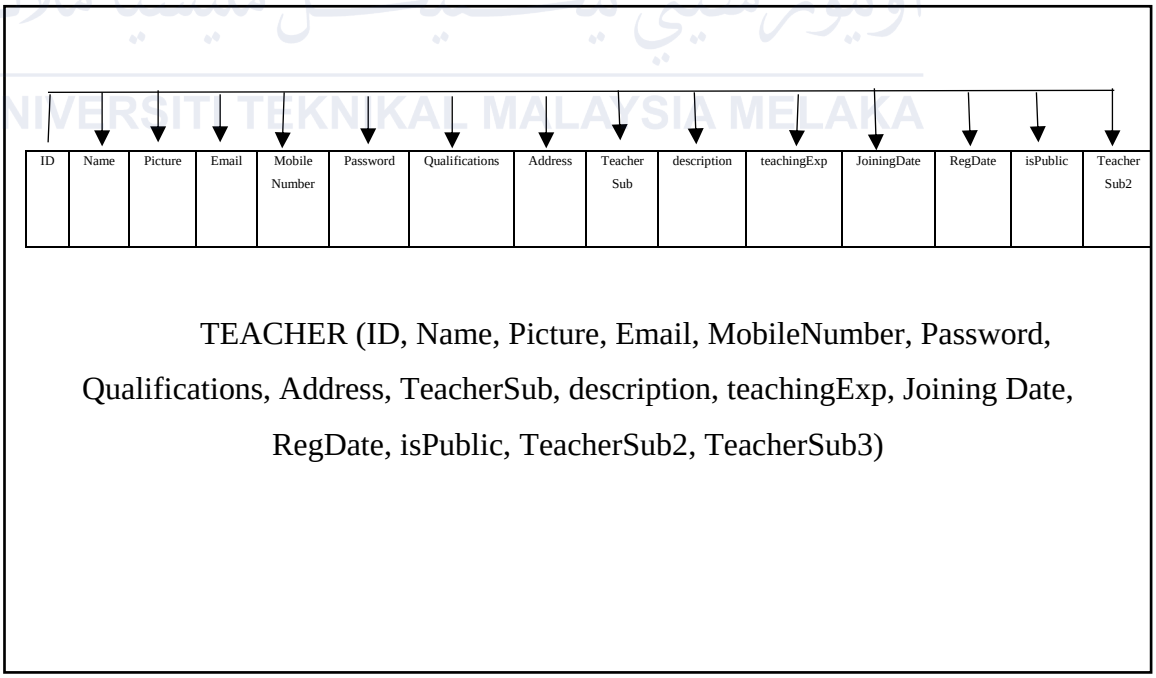

Figure 4.8: Normalization of Teacher Table

4.3.2.3 Aggregate Query, Subqueries and Join Query

This section utilizes aggregate queries to summarize data, subqueries for complex filtering, and join queries to combine related data across multiple tables can refer to **Table 4.7**. These techniques enable efficient data retrieval, allowing the system to generate insights and reports needed for effective management and decision-making in the Teachers Record Management System.

Table 4.7: Aggregate Query, Subqueries and Join Query

TYPE OF QUERY	QUERY	DESCRIPTION
SELECT statement	`SELECT Name, Email FROM tblteacher;`	This query retrieves all teachers' names and emails from the `tblteacher` table.
SELECT statement with Join Query	`SELECT tblstudents.StudentName, tblparent.name AS ParentName FROM tblstudents JOIN tblparent ON tblstudents.ParentID = tblparent.id;`	This query retrieves student names along with their parent's name by joining `tblstudents` and `tblparent`.
SELECT statement with Aggregate, Grouping and join Query	`SELECT tblteacher.Name AS TeacherName, COUNT(tblstudents.ID) AS NumberOfStudents FROM tblteacher LEFT JOIN tblstudents ON tblteacher.ID= tblstudents.TeacherID GROUP BY tblteacher.Name;`	This query retrieves the number of students assigned to each teacher.

SELECT statement with Aggregate, Grouping and join Query	SELECT tblteacher.Name AS TeacherName, COUNT(tblquery.id) AS TotalQueries FROM tblteacher LEFT JOIN tblquery ON tblteacher.ID = tblquery.teacherId GROUP BY tblteacher.Name;	This query retrieves the total number of queries each teacher has received.

4.3.3 Physical Database Design

The final stage of the database design process is physical database design. The objective of this stage is to implement the database based on the logical design. During this step, the information gathered during the logical design phase is transformed into a definition of the physical database, which includes the creation of tables, setting up primary and foreign keys, and enforcing constraints. At this stage, it is essential to know the Database Management System (DBMS) being used, as different DBMSs may have varying data types and naming conventions. The logical data model is converted into a set of Data Definition Language (DDL) statements that define the database structure.

4.3.3.1 Selection of DBMS

For the Teachers Record Management System, MySQL is chosen as the DBMS. MySQL is an open-source relational database management system (RDBMS) supported by Oracle. It is available on various platforms, including Linux, UNIX, and Windows. MySQL is widely used in web applications and online publishing but is also versatile enough to be used in a range of other applications. Its reliability, ease of use, and robust community support make it an ideal choice for managing the teacher-related data in this system.

4.3.3.2 Usage of Stored Procedures, Triggers, and Other Related Database Objects

Stored procedures and triggers are used to automate and enforce business logic within the database. Stored procedures encapsulate frequently executed queries and operations, improving performance and consistency by reducing code redundancy. Triggers automatically execute predefined actions in response to specific events, such

as data modifications, ensuring real-time updates and maintaining data integrity. These database objects streamline operations, enforce rules, and optimize the overall performance of the system.

4.4 Graphical User Interface (GUI) Design

The GUI design for the Teachers Record Management System is tailored to meet the specific needs of the different user roles within the system, including teachers, parents, and administrative staff. Each user interface is designed to provide an intuitive and efficient user experience, with layouts and functionalities aligned with the users' responsibilities and workflows.

4.4.1 Interface

The system features distinct interfaces for each user role to facilitate easy access to relevant functions and data. Each interface is designed with clear navigation paths, consistent design elements, and appropriate accessibility features to support a seamless interaction for all users, can refer **Figure 4.9 until Figure 4.70.**

4.4.1.1 Main Page

Purpose: To be a main page for Teacher, Parent, Admin and User

Input: The place details and button login.

Output: Teacher, Parent and Admin can make searching and login.

Design:

Figure 4.9: Main Page Design

Screen:

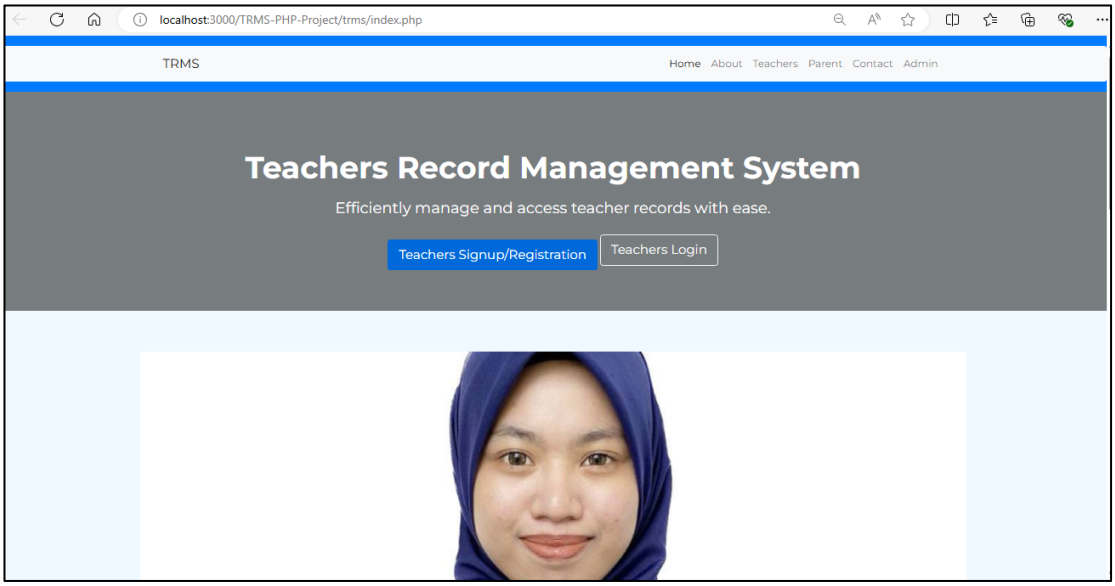

Figure 4.10: Main Page

4.4.1.2 About Page

Purpose: To provide information about the Teachers Record Management System.

Input: None.

Output: Displays information about the system's purpose.

Design:

Figure 4.11: About Page Design

Screen:

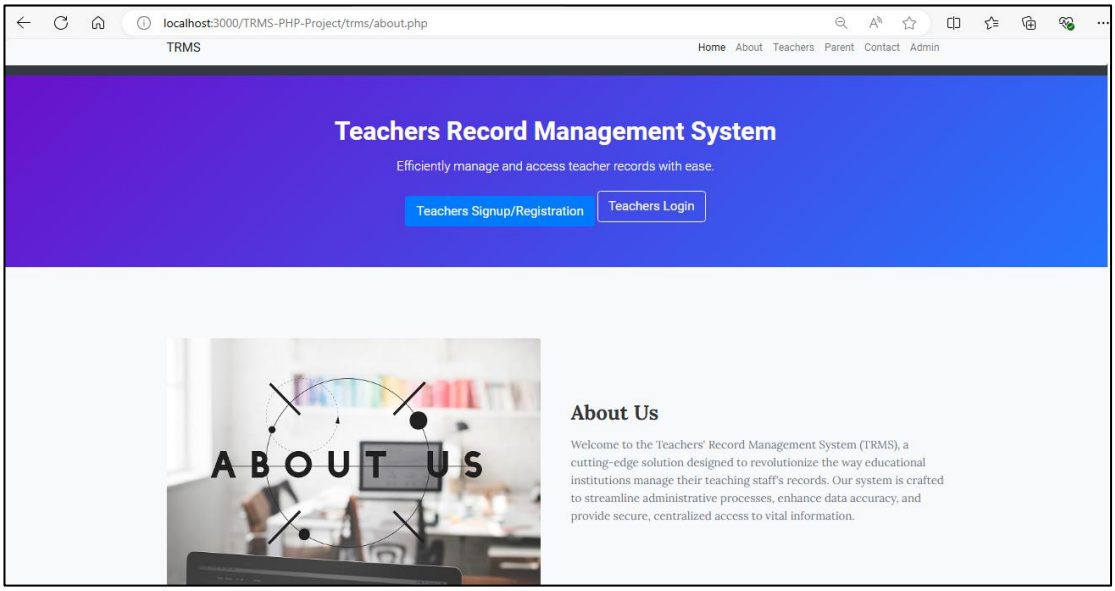

Figure 4.12: About Page

4.4.1.3 Listed Teacher Page

Purpose: To display a list of all registered teachers.

Input: Search criteria such as subject or teacher name.

Output: A list of teachers matching the search criteria.

Design:

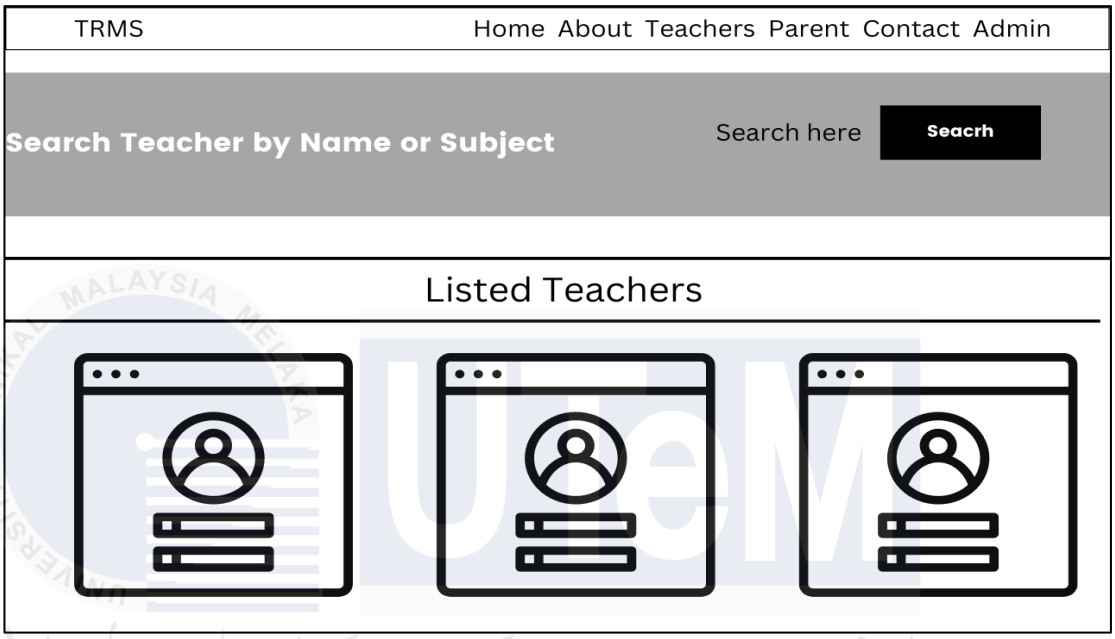

Figure 4.13: Listed Teacher Page Design

Screen:

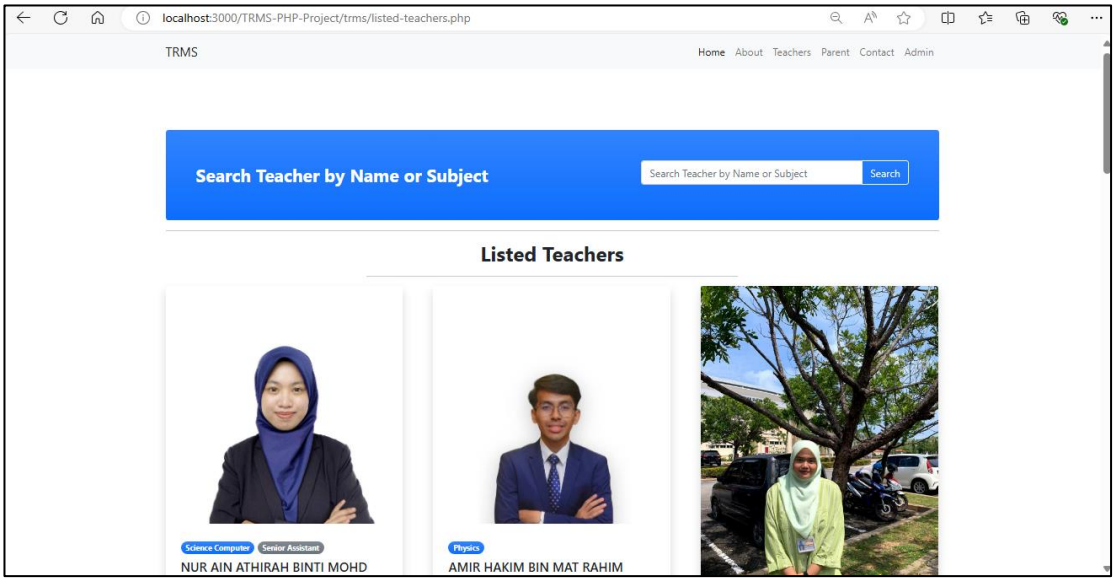

Figure 4.14: Listed Teacher Page

4.4.1.4 Search Result Page

Purpose: To display search results based on the input criteria.

Input: Search keywords entered by the user.

Output: A list of matching results from the database.

Design:

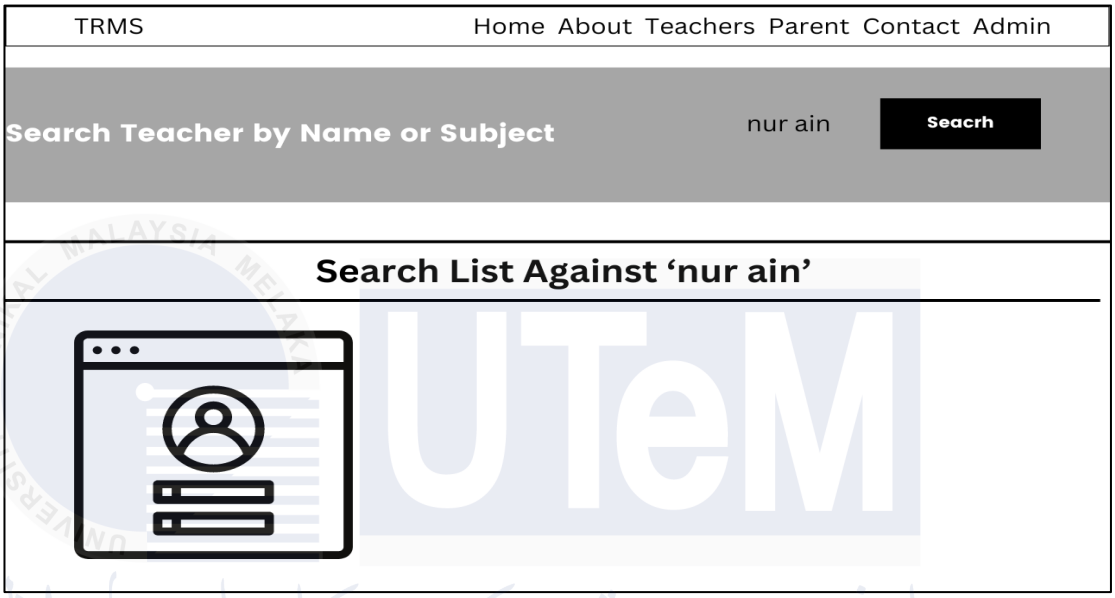

Figure 4.15: Search Result Page Design

Screen:

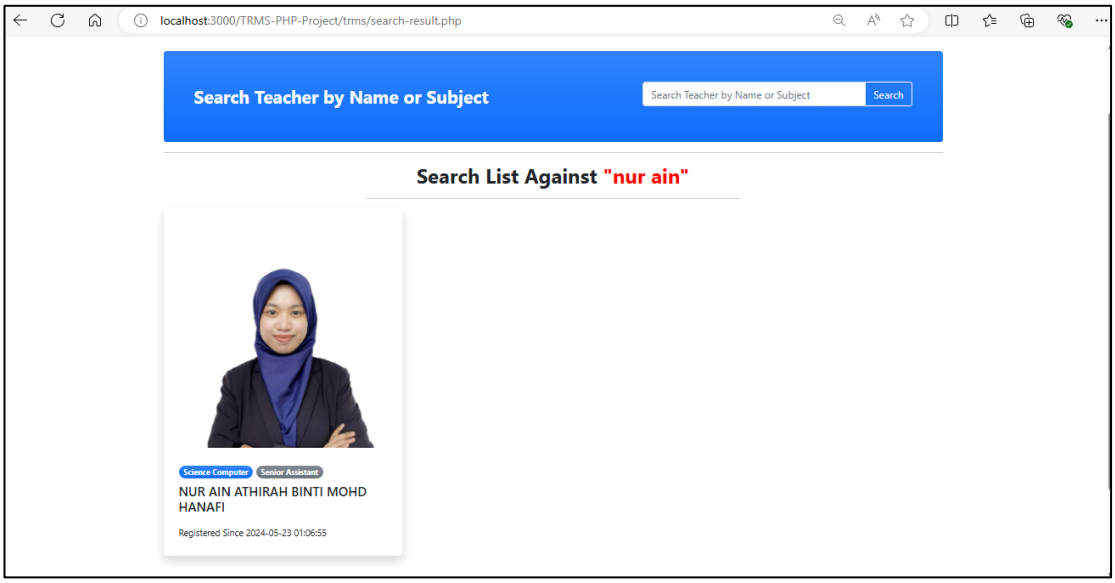

Figure 4.16: Search Result Page

4.4.1.5 Teacher Details Page

Purpose: To provide detailed information about a selected teacher.

Input: Teacher ID or selection from the listed teachers.

Output: Displays teacher details including qualifications, subjects taught, and contact information.

Design:

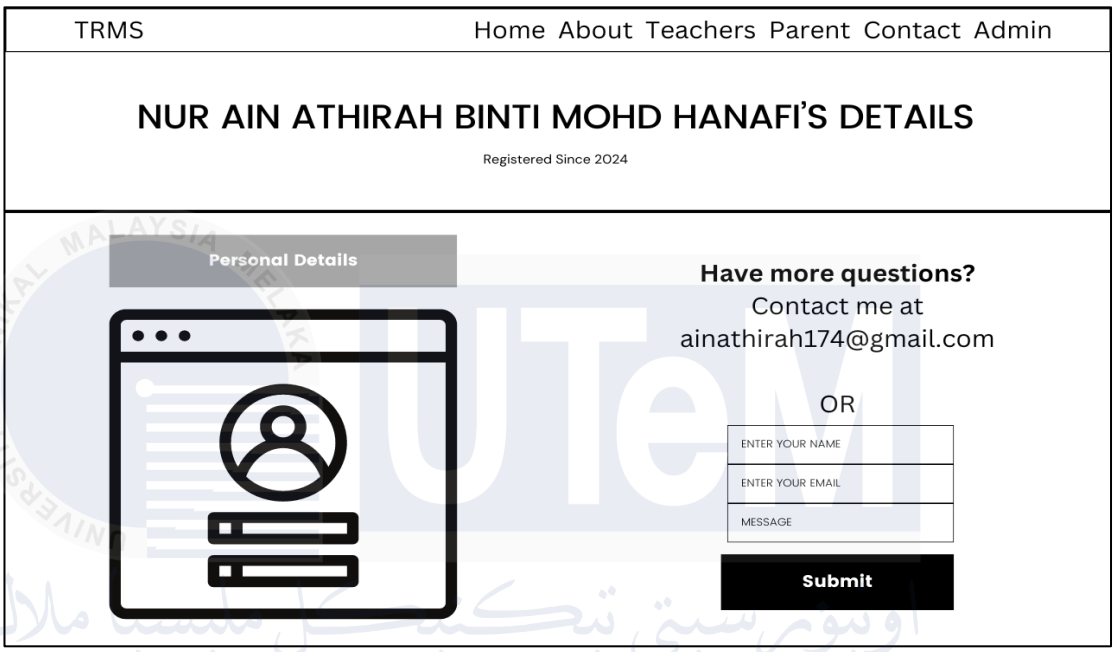

Figure 4.17: Teacher Detail Page Design 1

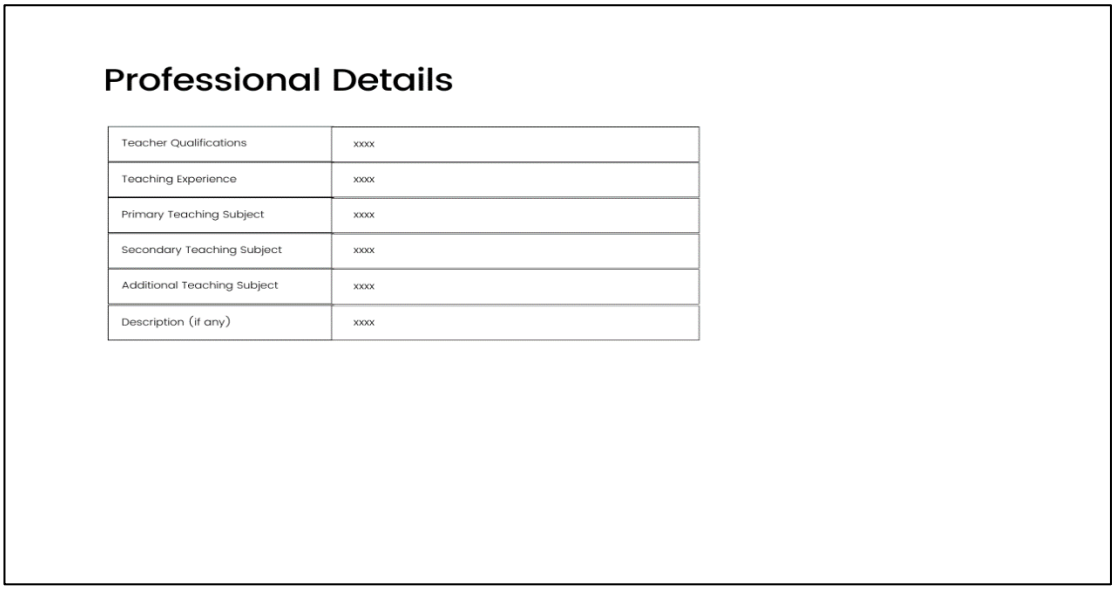

Figure 4.18: Teacher Detail Page Design 2

Screen:

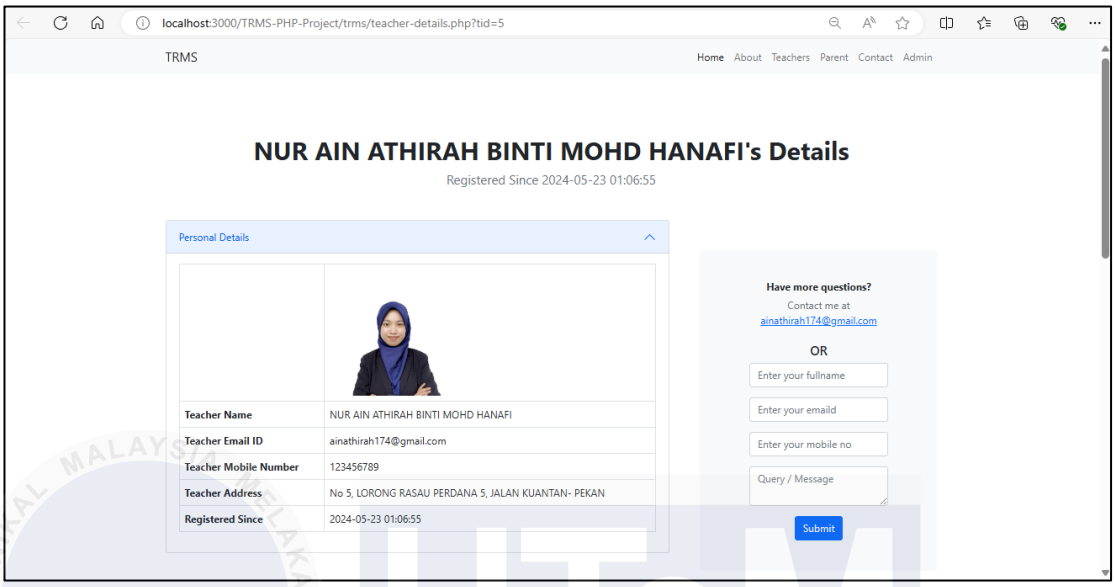

Figure 4.19: Teacher Detail Page 1

Figure 4.20: Teacher Detail Page 2

4.4.1.6 Teacher Login Page

Purpose: To allow teachers to securely log into the system.

Input: Username and password.

Output: Grants access to the teacher dashboard upon successful login.

Design:

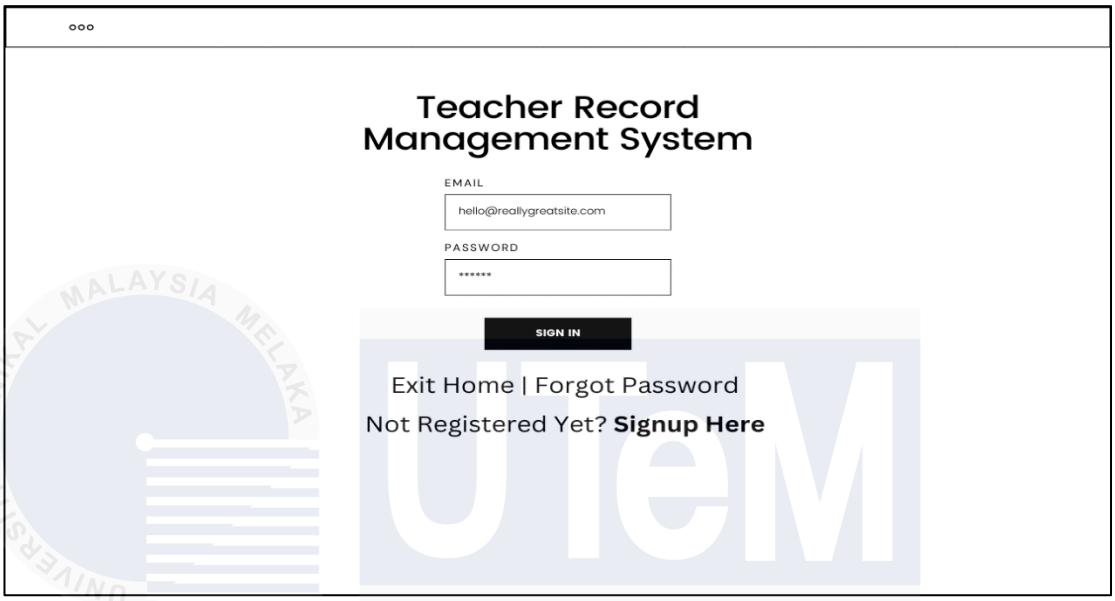

Figure 4.21: Teacher Login Page Design

Screen:

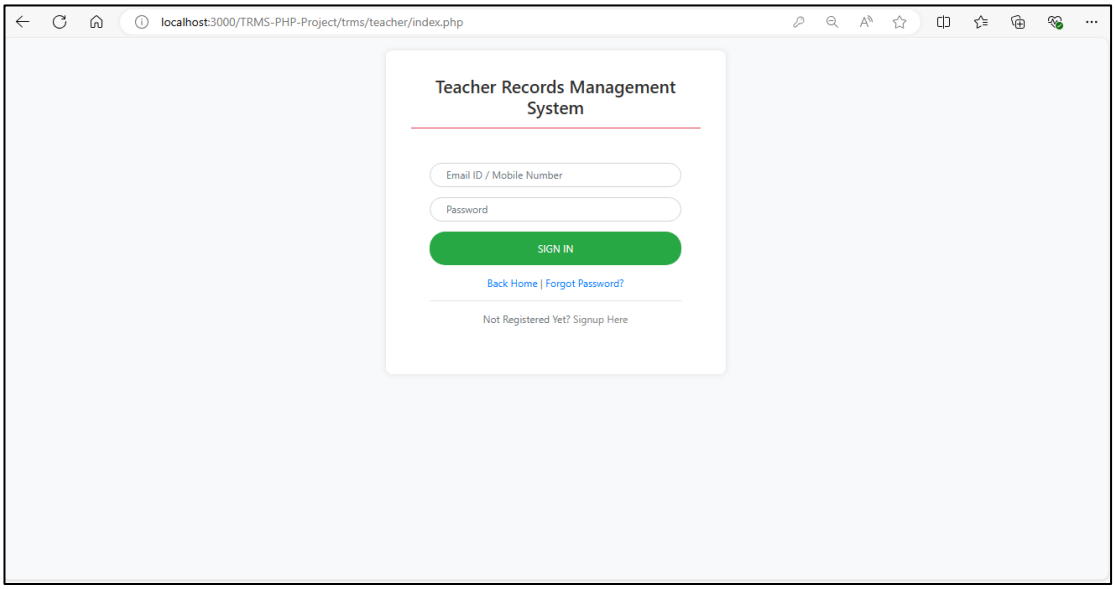

Figure 4.22: Teacher Login Page

4.4.1.7 Teachers Signup Page

Purpose: To enable new teachers to sign up and create an account.

Input: Personal information such as name, email, mobile number, and password.

Output: A new teacher account is created in the system.

Design:

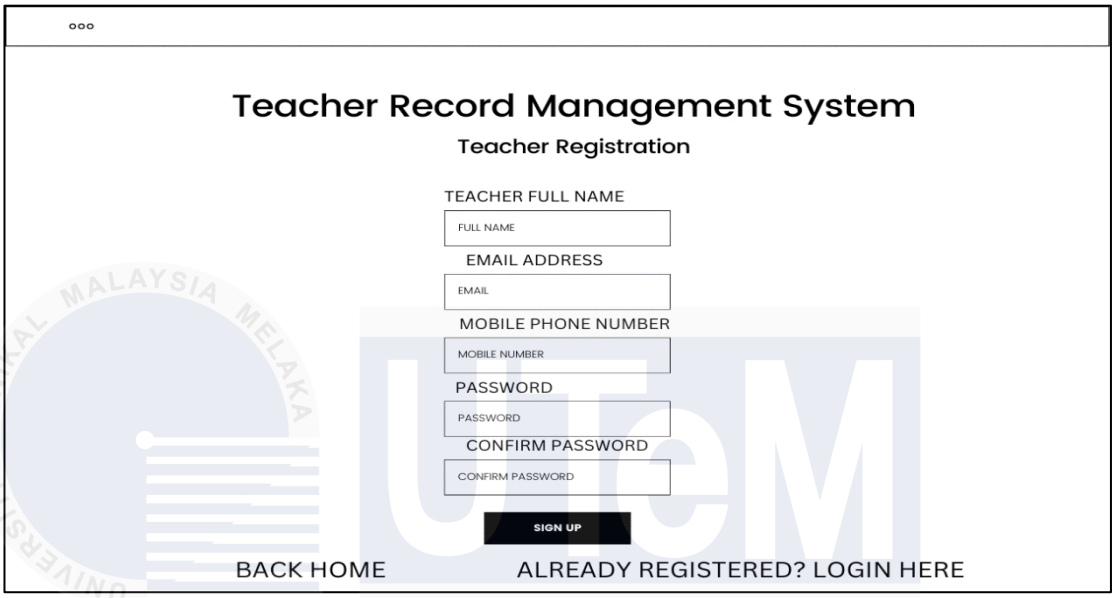

Figure 4.23: Teacher Signup Page Design

Screen:

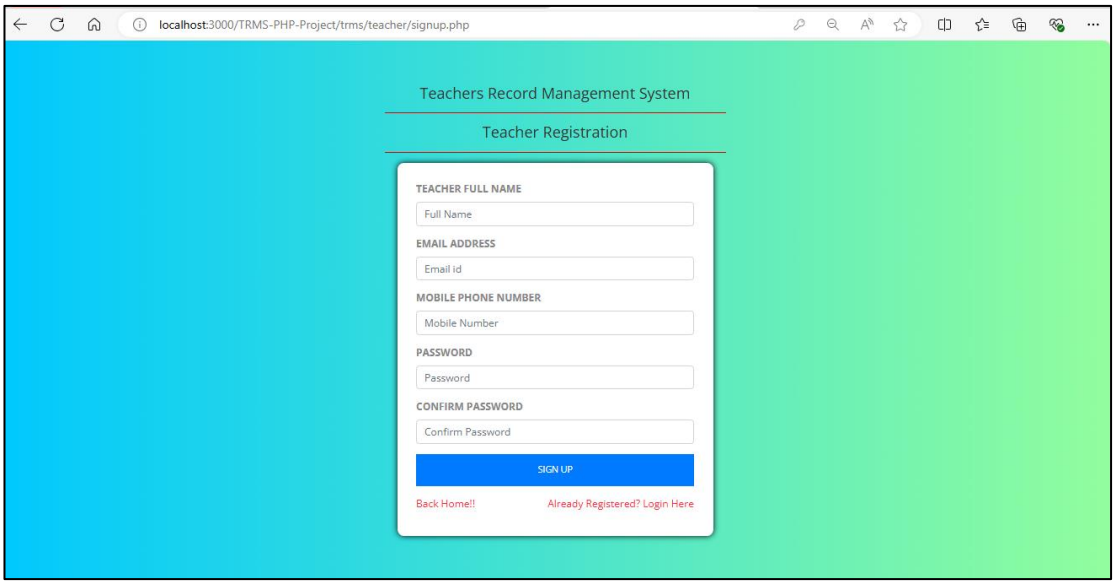

Figure 4.24: Teacher Signup Page

4.4.1.8 Teachers Dashboard

Purpose: To provide teachers with an overview of their viewing messages.

Input: Login credentials to access the dashboard.

Output: Displays teacher-specific data and options for managing their tasks.

Design:

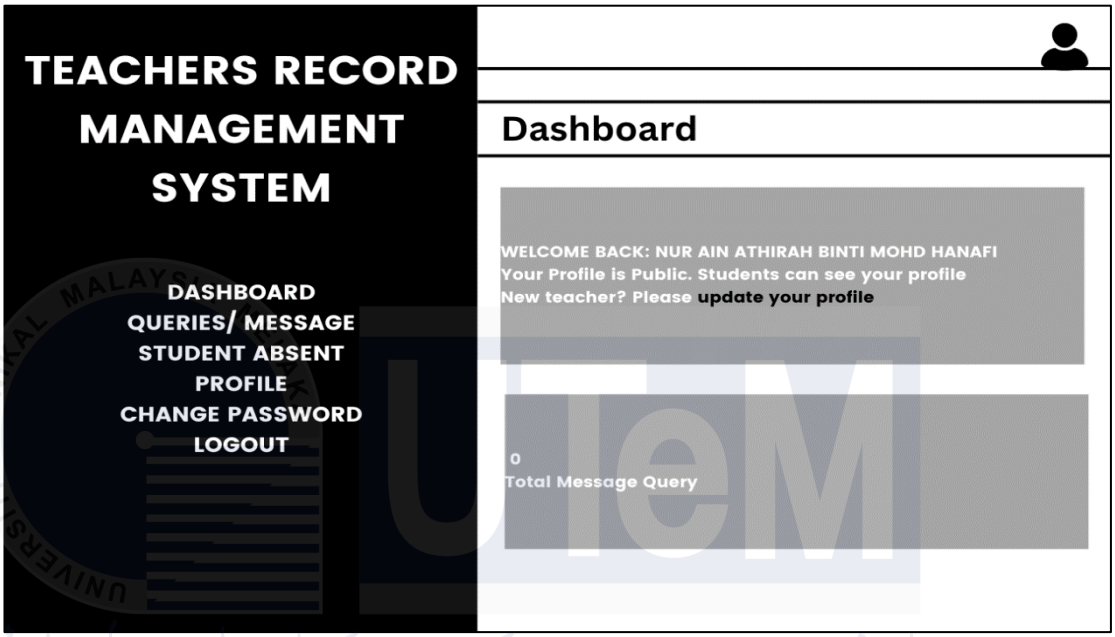

Figure 4.25: Teacher Dashboard Design

Screen:

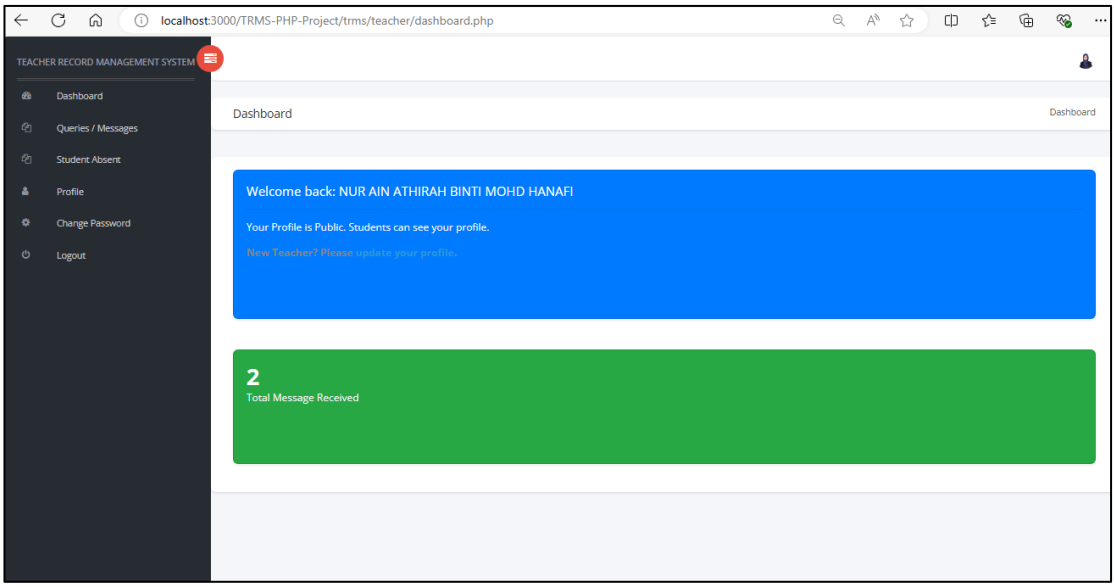

Figure 4.26: Teacher Dashboard

4.4.1.9 Teacher Query Page

Purpose: To allow teachers to view and respond to queries from users.

Input: Query details.

Output: Displays queries for teachers to respond.

Design:

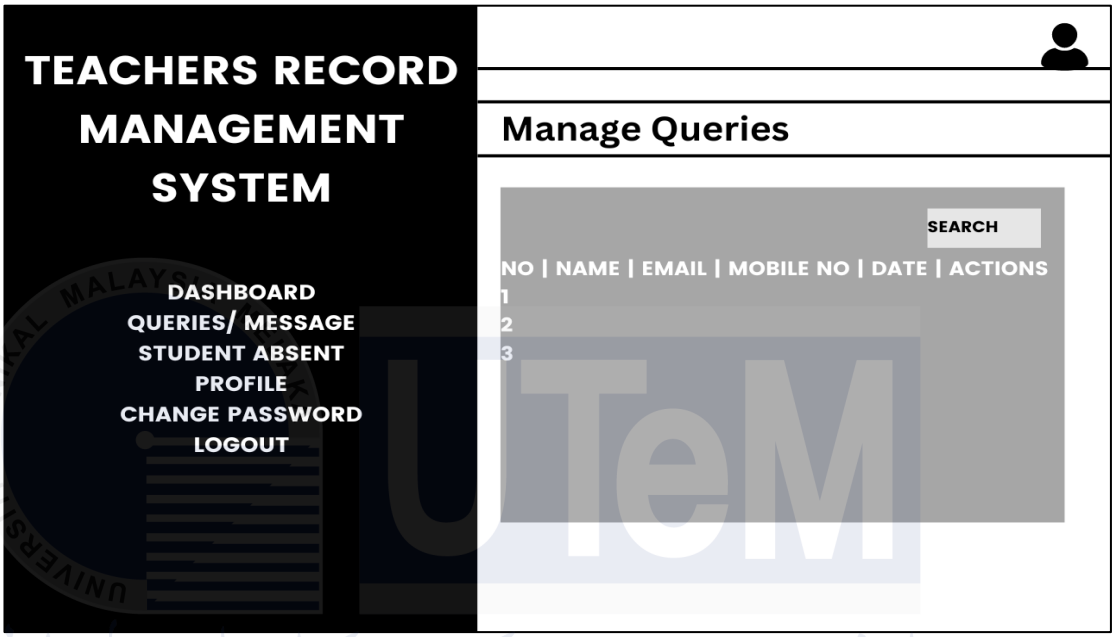

Figure 4.27: Teacher Query Page Design

Screen:

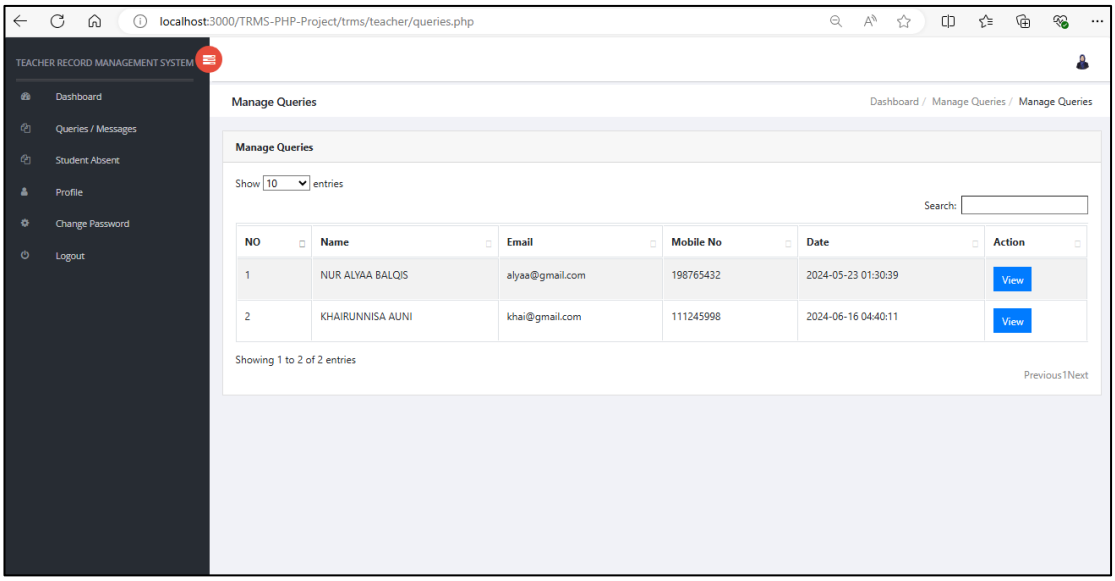

Figure 4.28: Teacher Query Page

4.4.1.10 Teacher Query Details Page

Purpose: To show detailed information about a specific query submitted to the teacher.

Input: Selection from the list of queries.

Output: Displays full query details and options for responding.

Design:

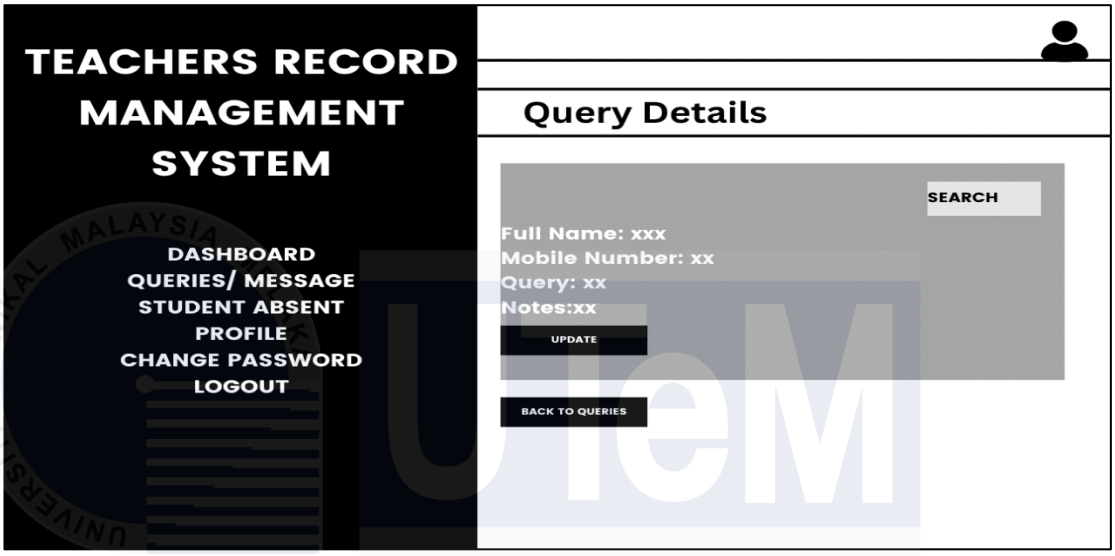

Figure 4.29: Teacher Query Details Page Design

Screen:

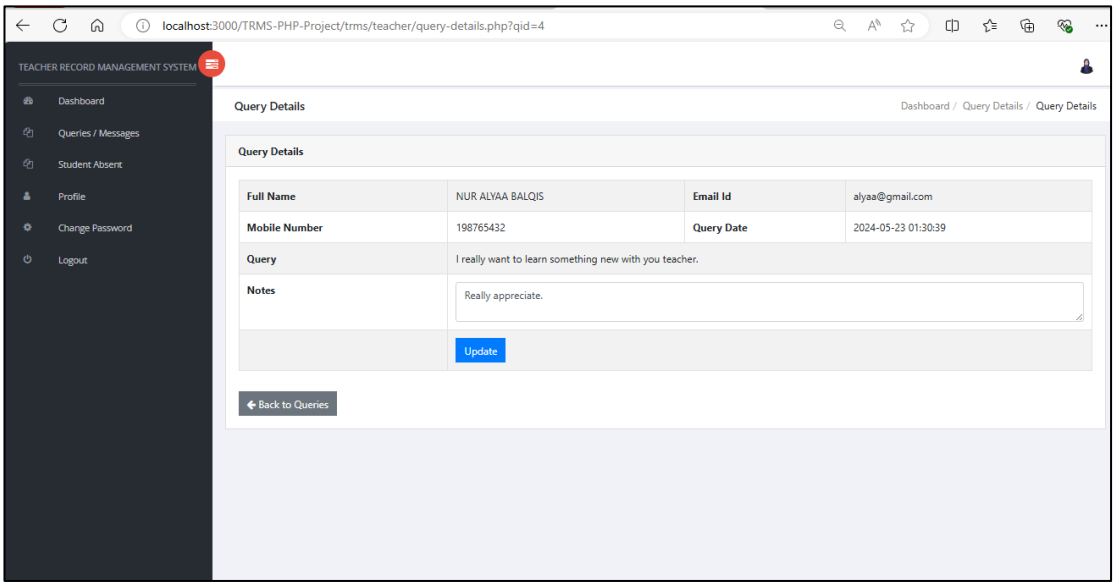

Figure 4.30: Teacher Query Details Page

4.4.1.11 Teacher View Student Absence Page

Purpose: To allow teachers to view records of student absences submitted by parents.

Input: -

Output: Displays the absence records.

Design:

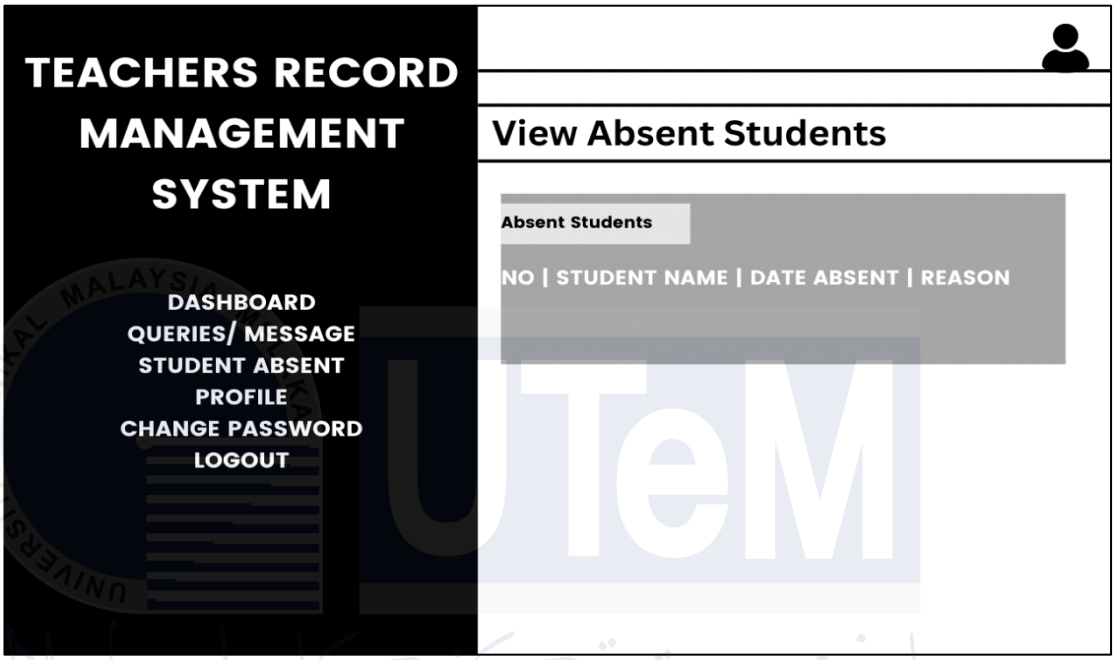

Figure 4.31: Teacher View Student Absence Page Design

Screen:

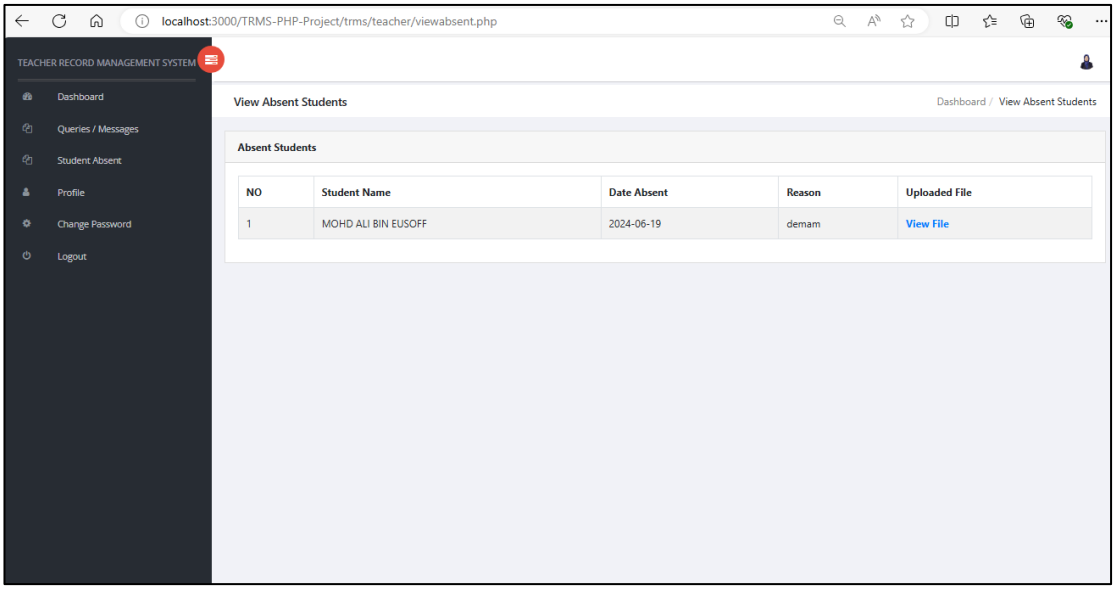

Figure 4.32: Teacher View Student Absence Page

4.4.1.12 Teacher Profile Page

Purpose: To allow teachers to view and update their profile information.

Input: Teacher's personal details.

Output: Updated profile information in the system.

Design:

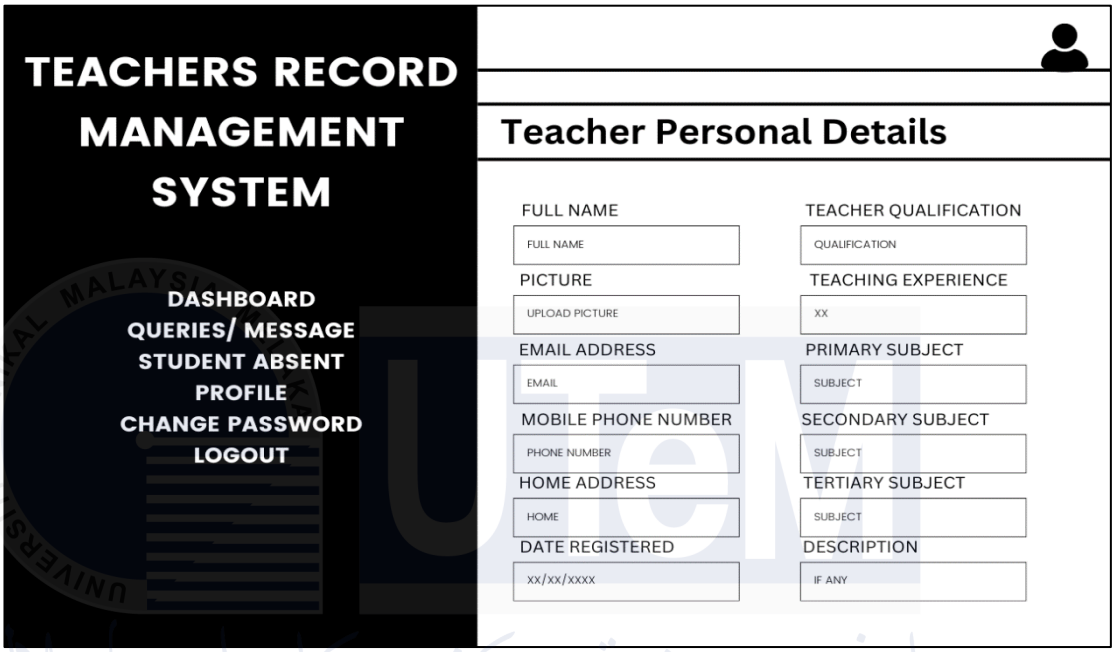

Figure 4.33: Teacher Profile Page Design

Screen:

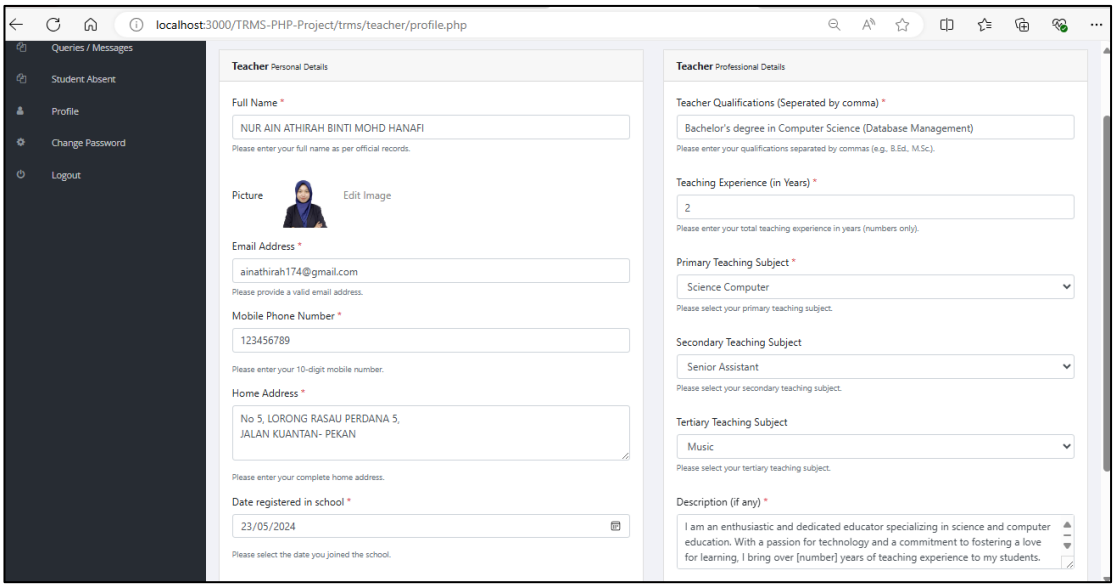

Figure 4.34: Teacher Profile Page

4.4.1.13 Teacher Change Password Page

Purpose: To enable teachers to securely change their account password.

Input: Current password, new password, and confirmation of new password.

Output: Updated password for the teacher's account.

Design:

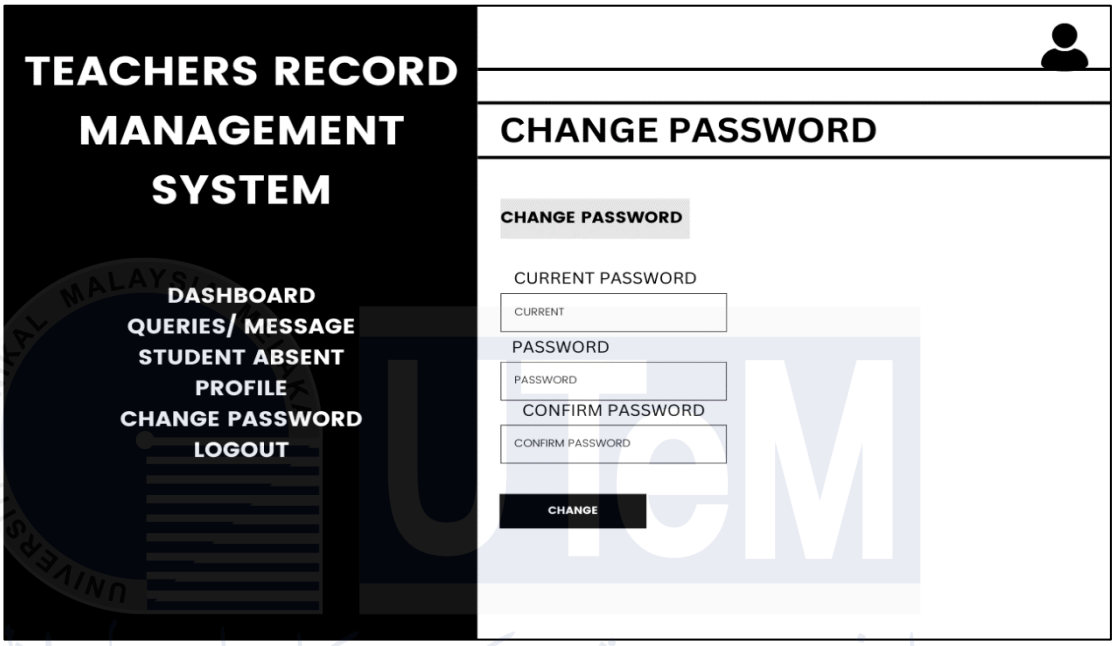

Figure 4.35: Teacher Change Password Page Design

Screen:

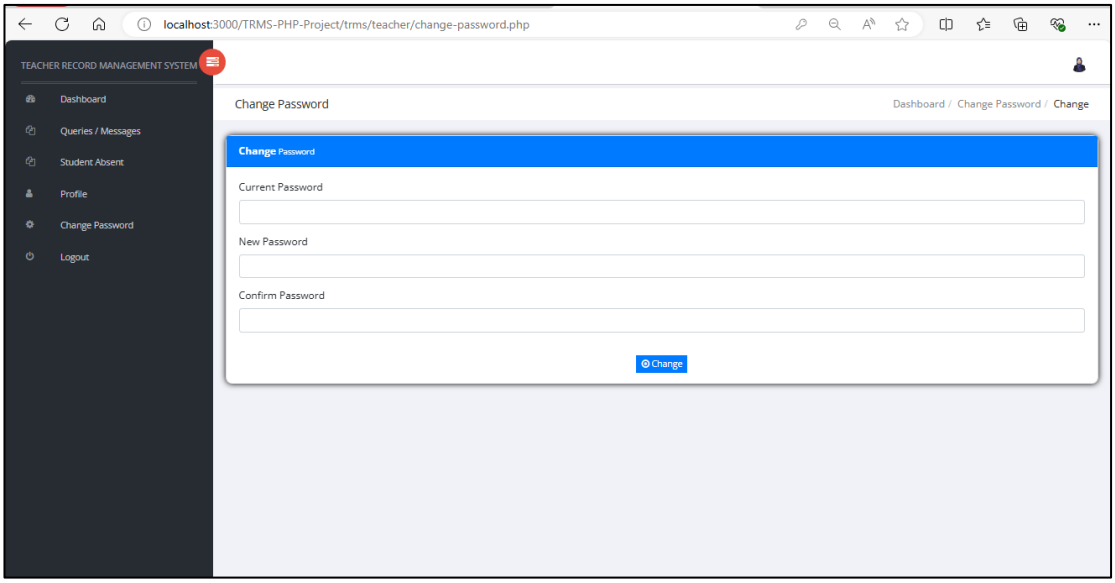

Figure 4.36: Teacher Change Password Page

4.4.1.14 Parent Login Page

Purpose: To allow parents to securely log into the system.

Input: Username and password.

Output: Grants access to the parent dashboard upon successful login.

Design:

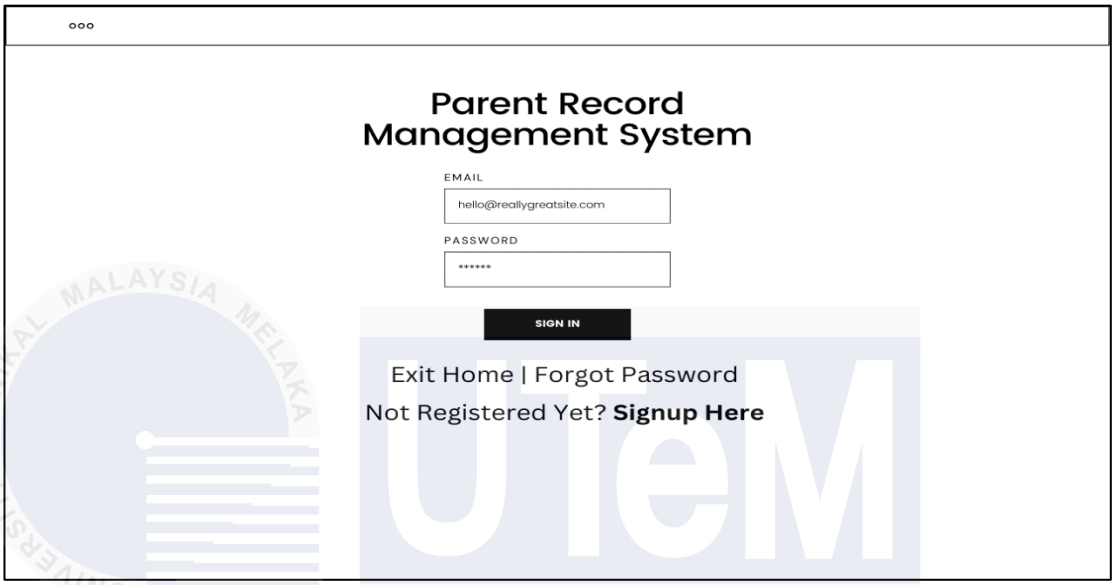

Figure 4.37: Parent Login Page Design

Screen:

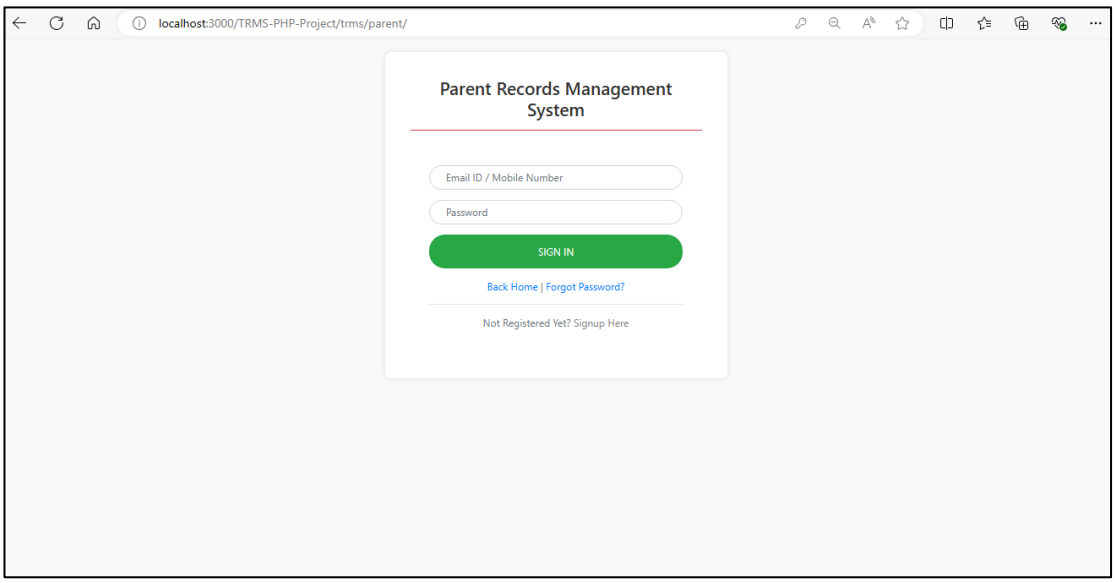

Figure 4.38: Parent Login Page

4.4.1.15 Parent Signup Page

Purpose: To enable new parents to sign up and create an account.

Input: Personal information such as name, email, and password.

Output: A new parent account is created in the system.

Design:

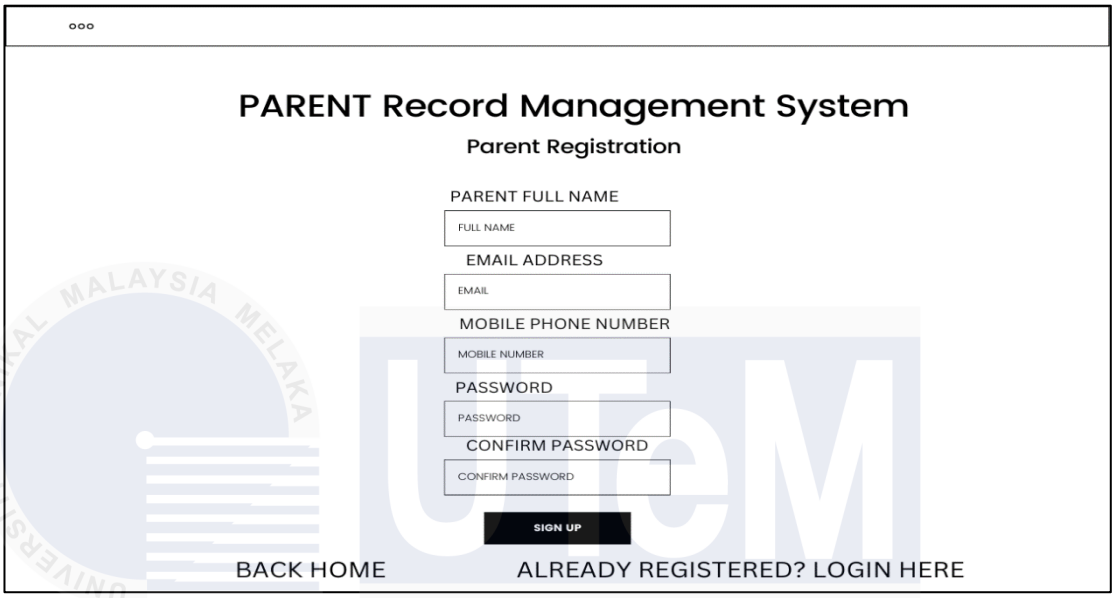

Figure 4.39: Parent Signup Page Design

Screen:

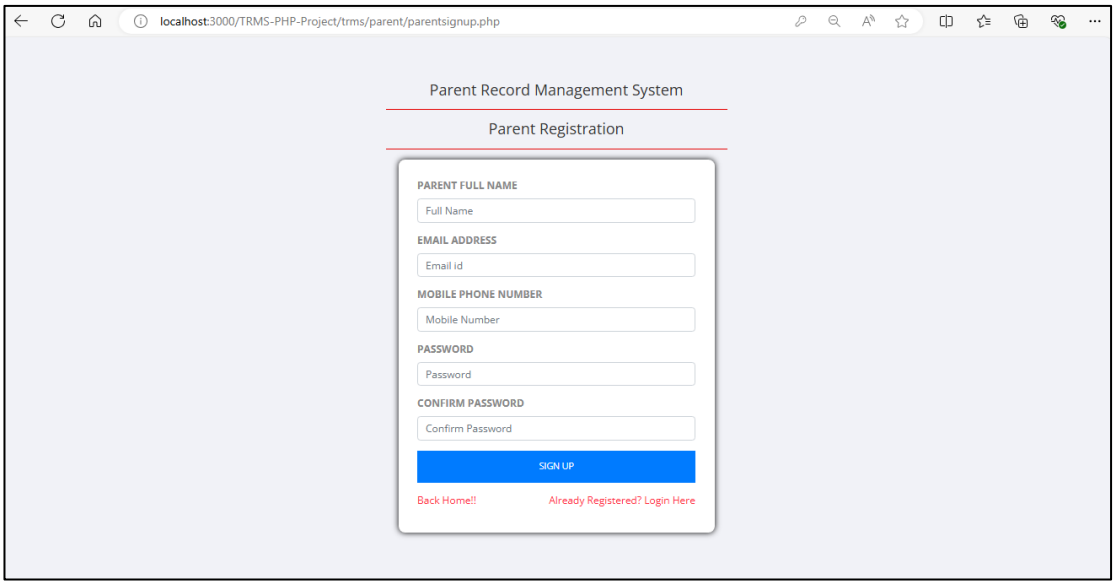

Figure 4.40: Parent Signup Page

4.4.1.16 Parent Dashboard

Purpose: To provide parents with an overview of their activities viewing records.

Input: Login credentials to access the dashboard.

Output: Displays parent-specific data and options for managing their tasks.

Design:

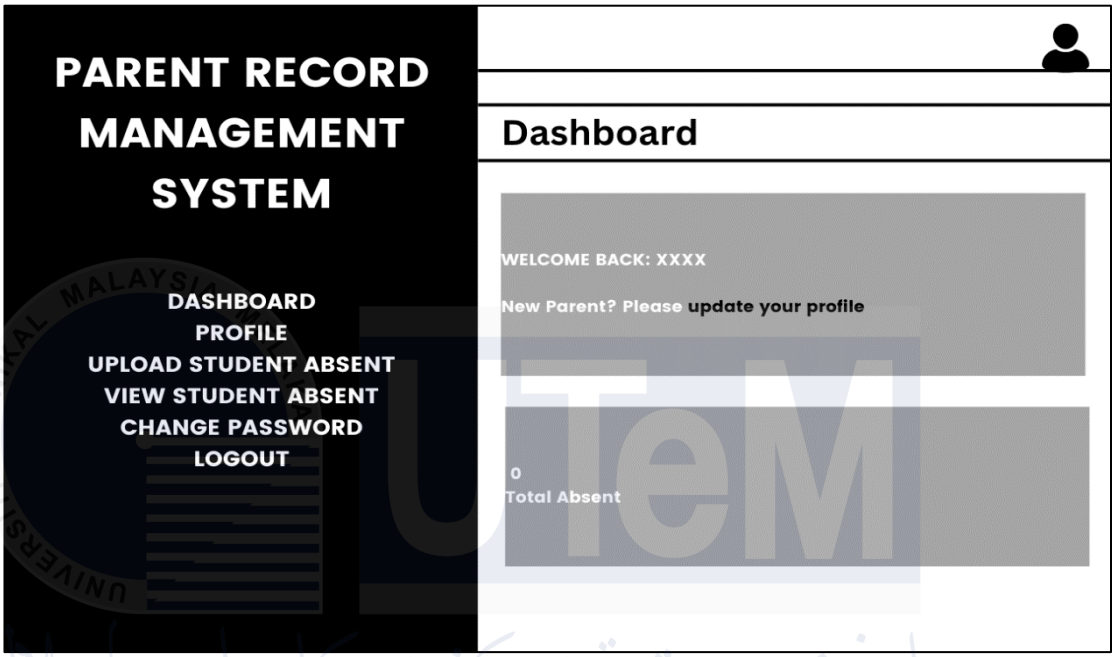

Figure 4.41: Parent Dashboard Design

Screen:

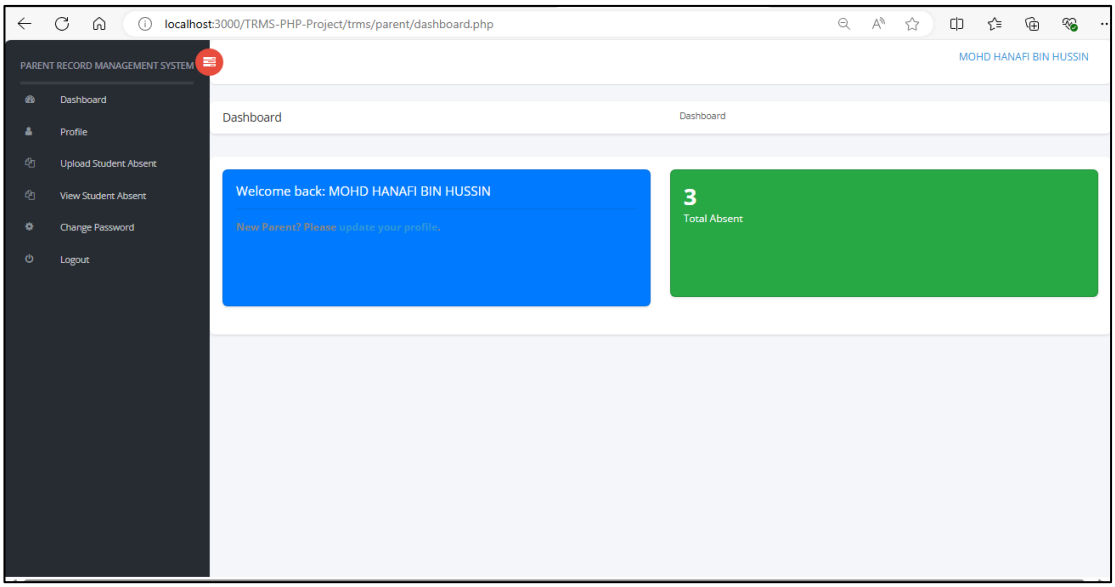

Figure 4.42: Parent Dashboard

4.4.1.17 Parent Profile Page

Purpose: To allow parents to view and update their profile information.

Input: Parent's personal details.

Output: Updated profile information in the system.

Design:

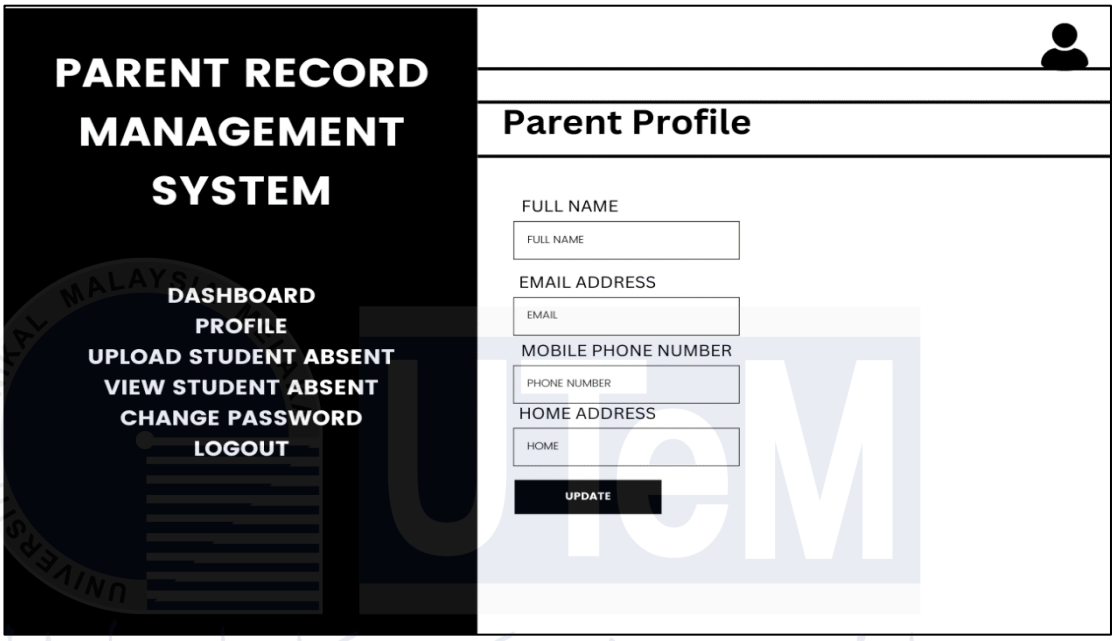

Figure 4.43: Parent Profile Page Design

Screen:

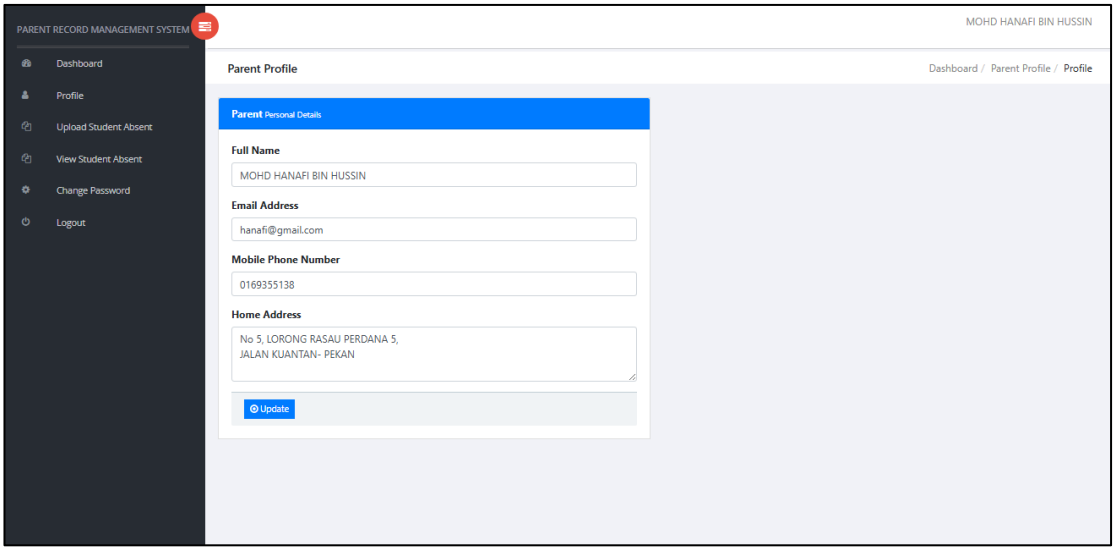

Figure 4.44: Parent Profile Page

4.4.1.18 Parent Upload Absence Page

Purpose: To enable parents to upload student absence records to the system.

Input: Student details, absence date, reason, and any supporting files.

Output: A new absence record is created and stored in the system.

Design:

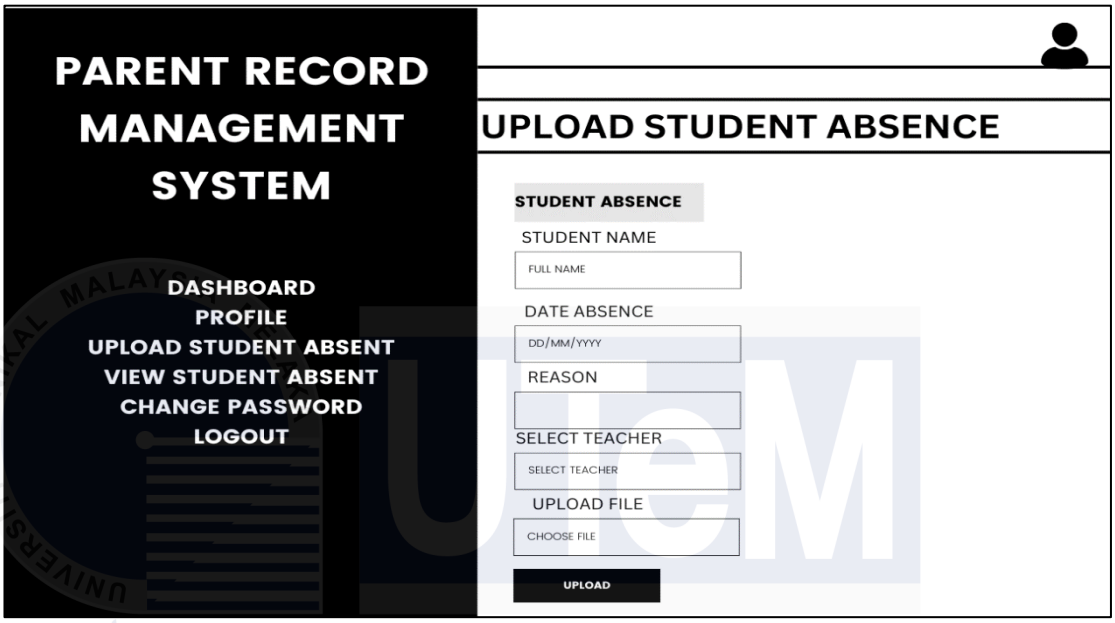

Figure 4.45: Parent Upload Absence Page Design

Screen:

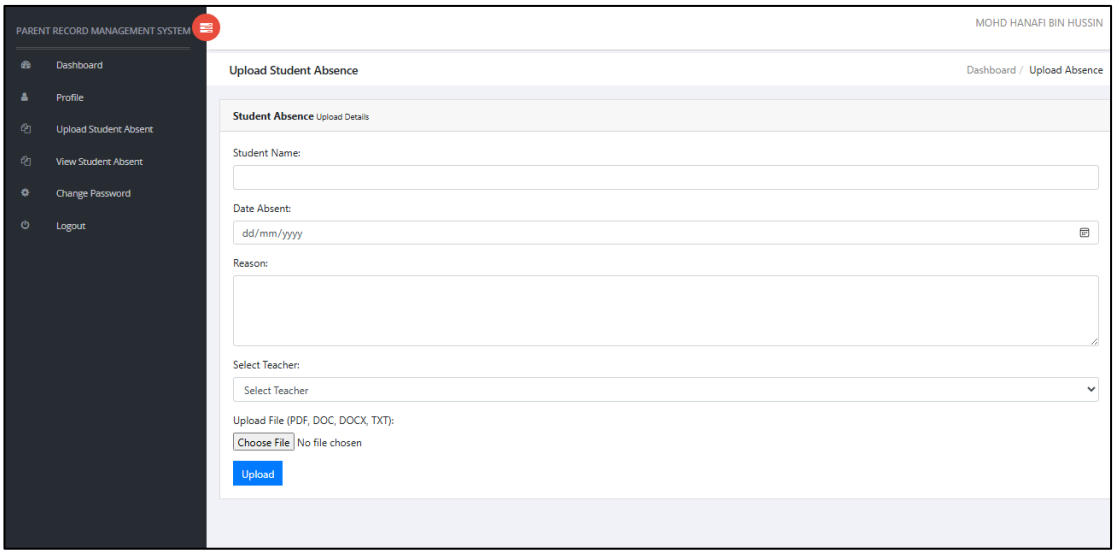

Figure 4.46: Parent Upload Absence Page

4.4.1.19 Parent View Absence Page

Purpose: To allow parents to view records of their child's absences.

Input: -

Output: Displays the absence records.

Design:

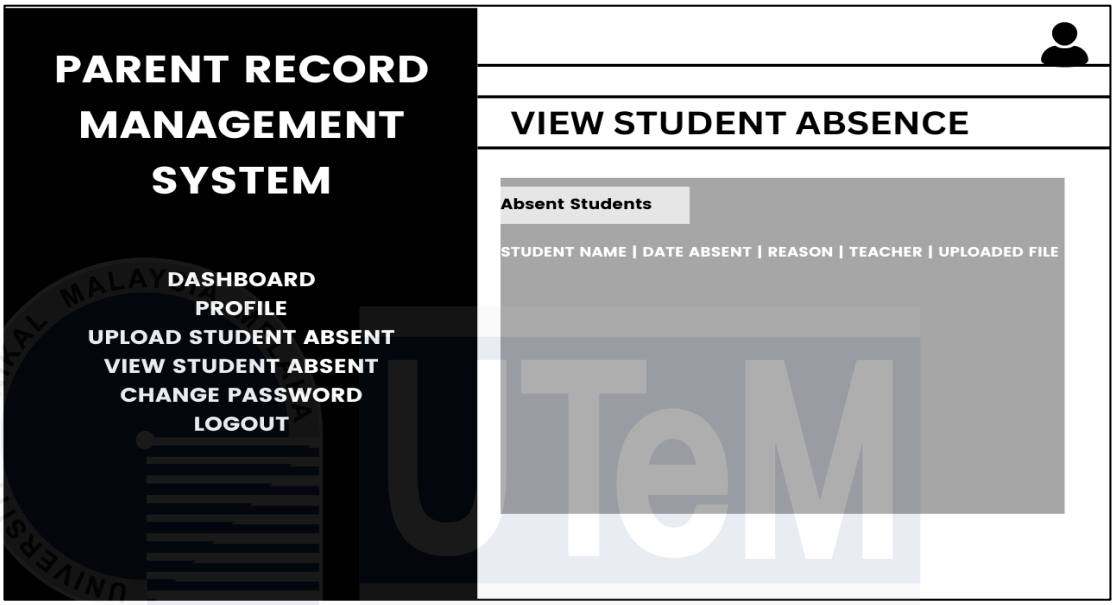

Figure 4.47: Parent View Absence Page Design

Screen:

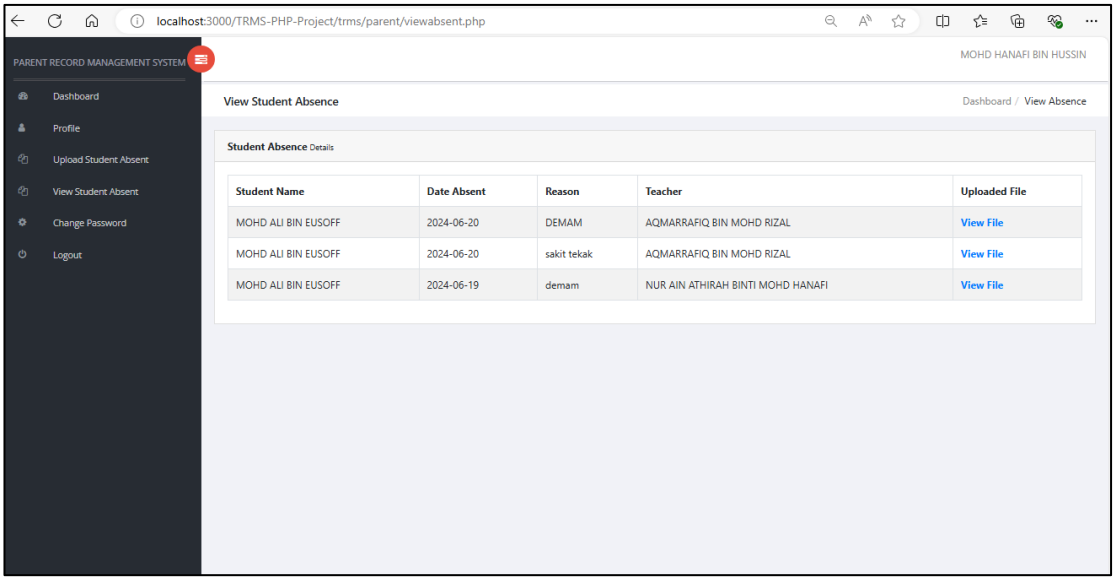

Figure 4.48: Parent View Absence Page

4.4.1.20 Parent Change Password Page

Purpose: To enable parents to securely change their account password.

Input: Current password, new password, and confirmation of new password.

Output: Updated password for the parent's account.

Design:

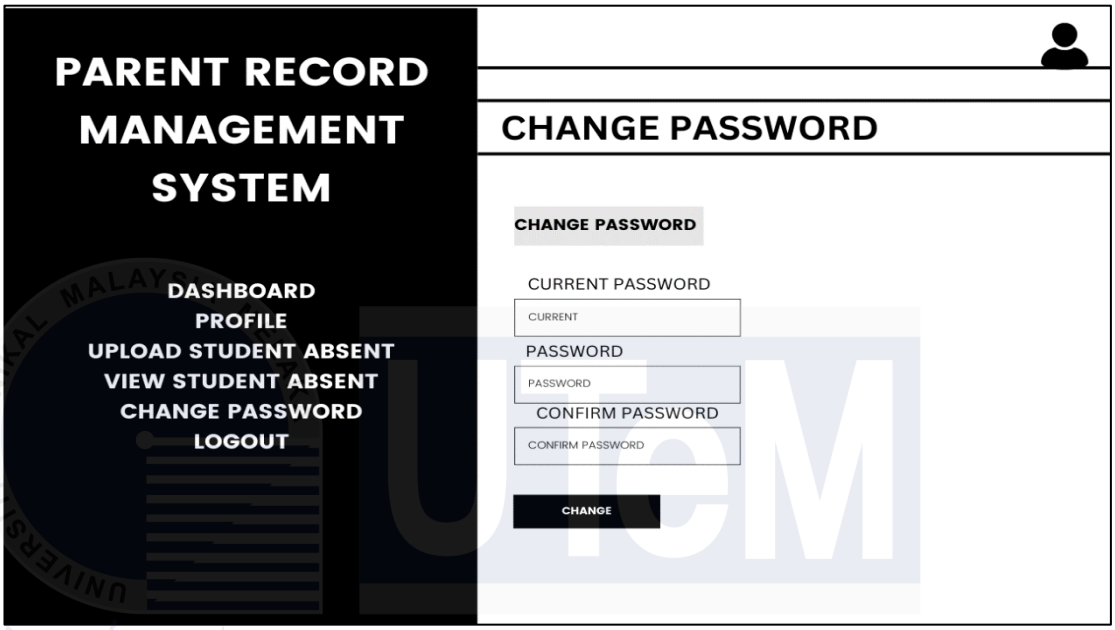

Figure 4.49: Parent Change Password Page Design

Screen:

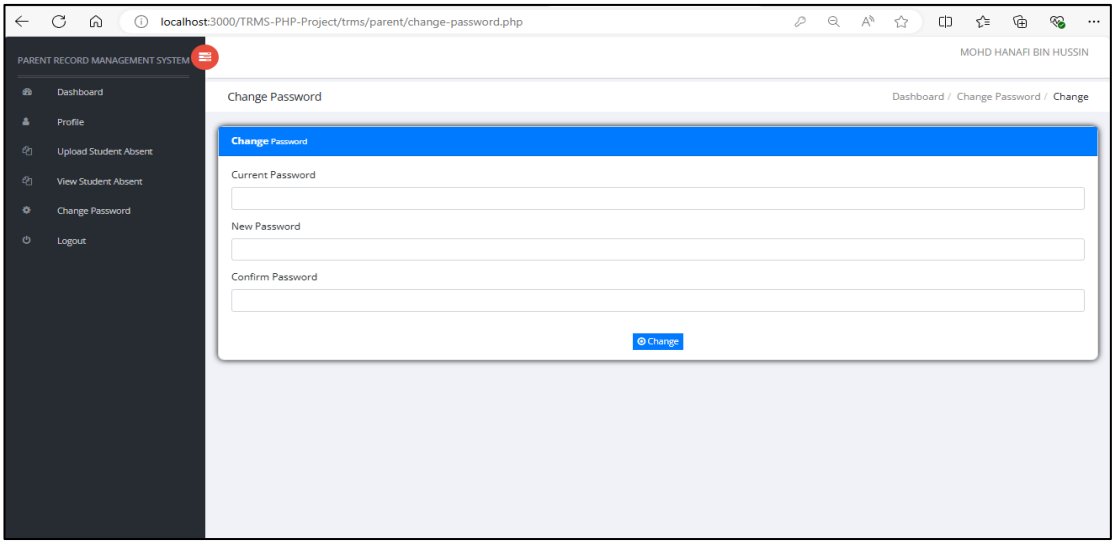

Figure 4.50: Parent Change Password Page

4.4.1.21 Contact Admin Page

Purpose: To allow users to contact the admin for support or queries.

Input: -

Output: Detail contact of developer.

Design:

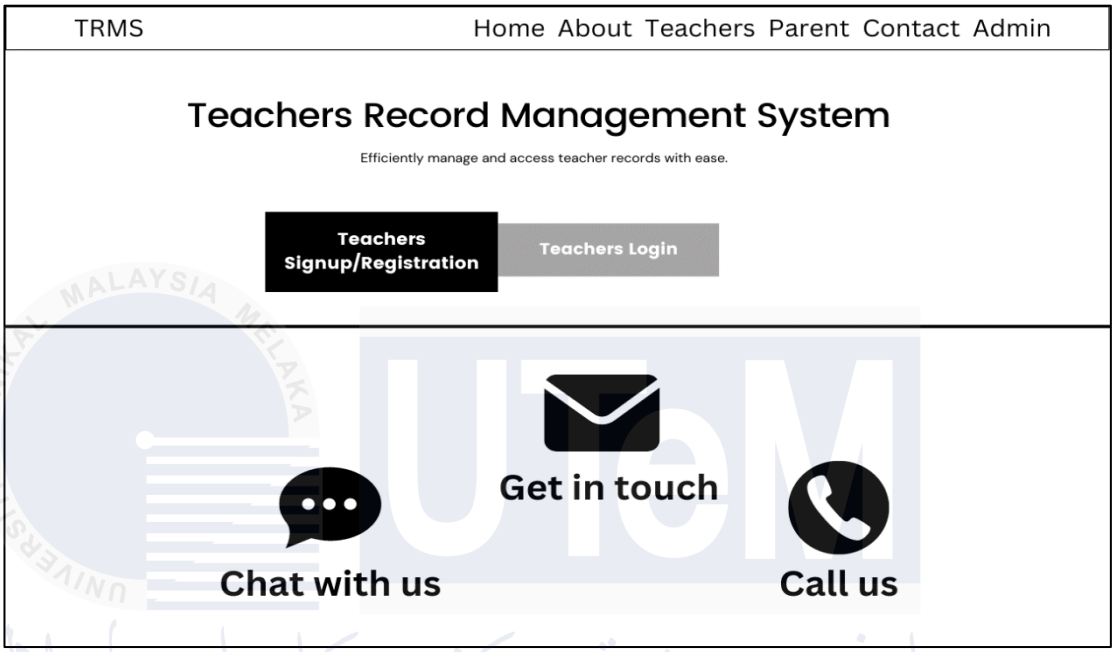

Figure 4.51: Contact Admin Page Design

Screen:

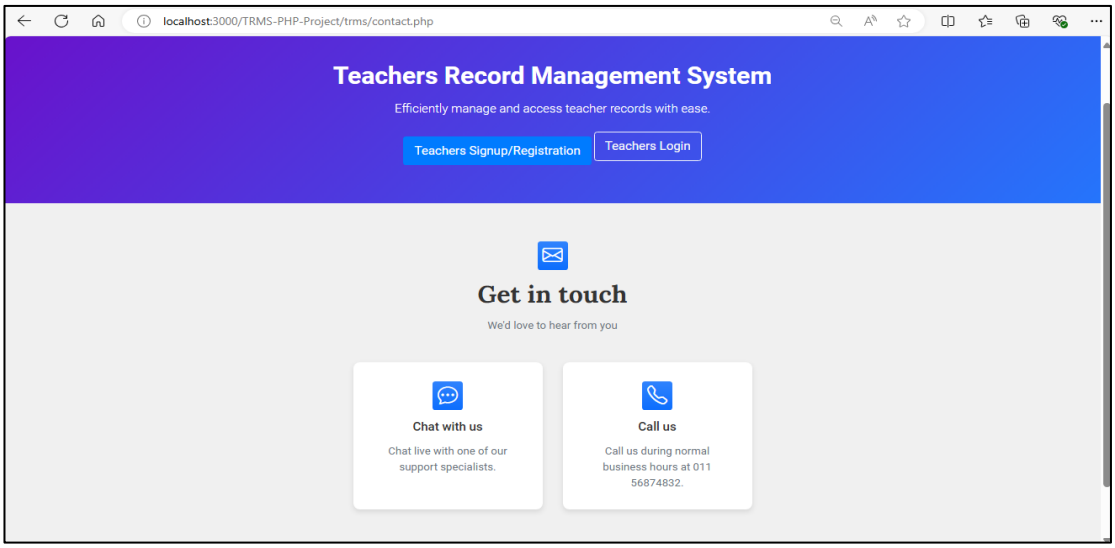

Figure 4.52: Contact Admin Page

4.4.1.22 Admin Login Page

Purpose: To allow admins to securely log into the system.

Input: Username and password.

Output: Grants access to the admin dashboard upon successful login.

Design:

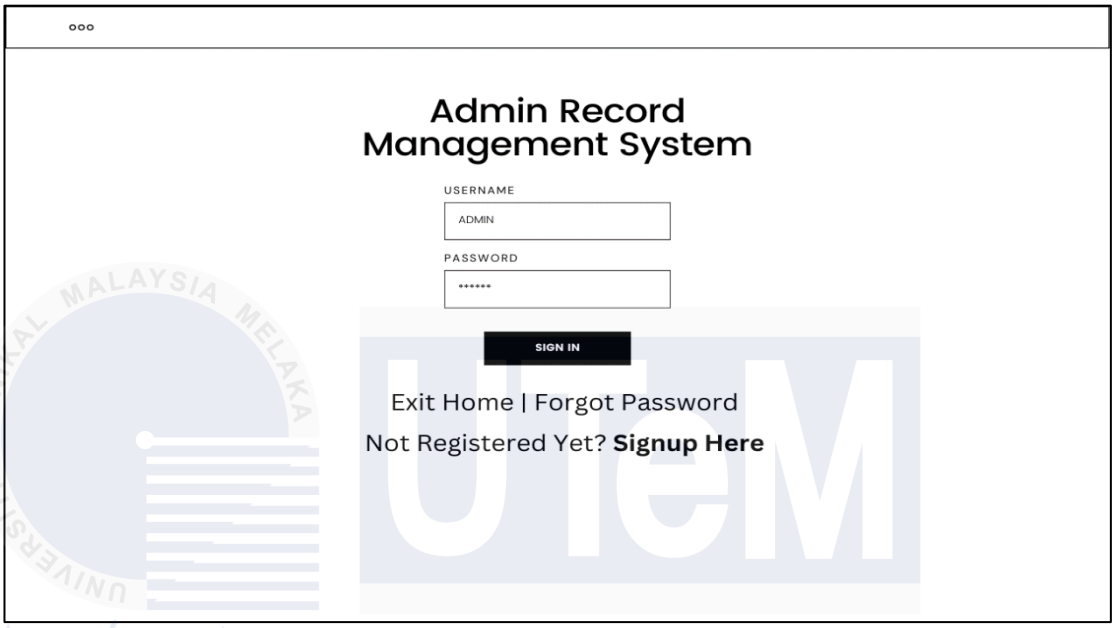

Figure 4.53: Admin Login Page Design

Screen:

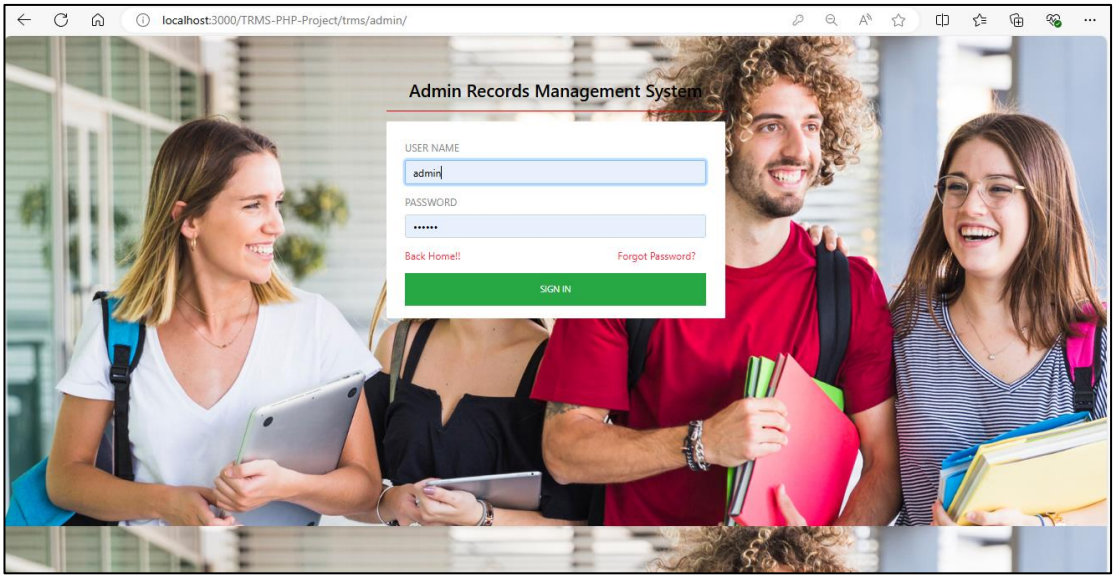

Figure 4.54: Admin Login Page

4.4.1.23 Admin Dashboard

Purpose: To provide admins with an overview of system management activities, including managing teachers, subjects, and student absences.

Input: Login credentials to access the dashboard.

Output: Displays admin-specific data and options for managing the system.

Design:

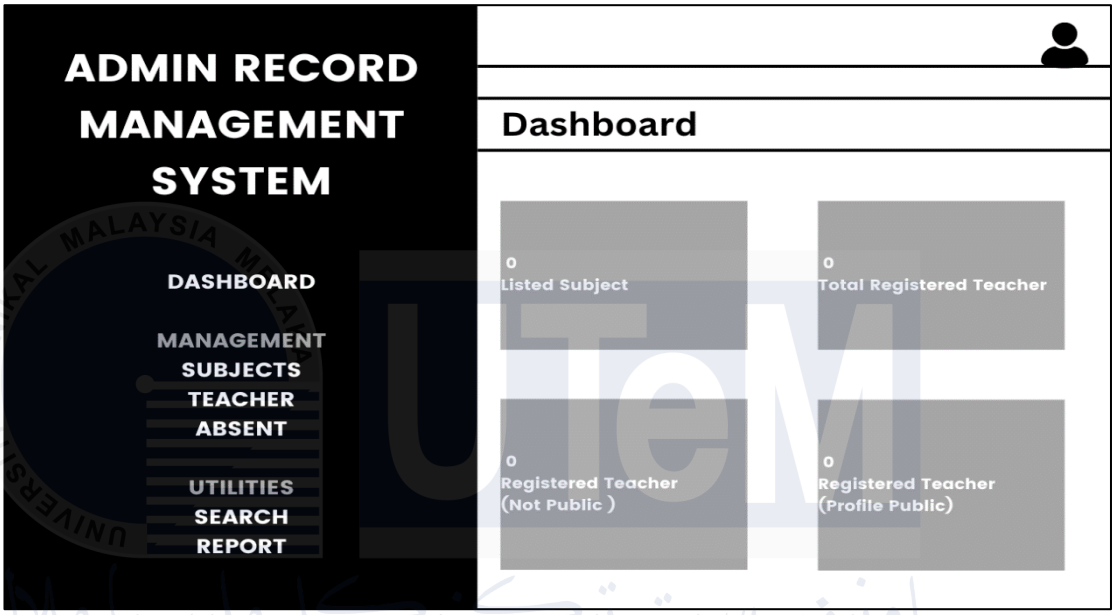

Figure 4.55: Admin Dashboard Design

Screen:

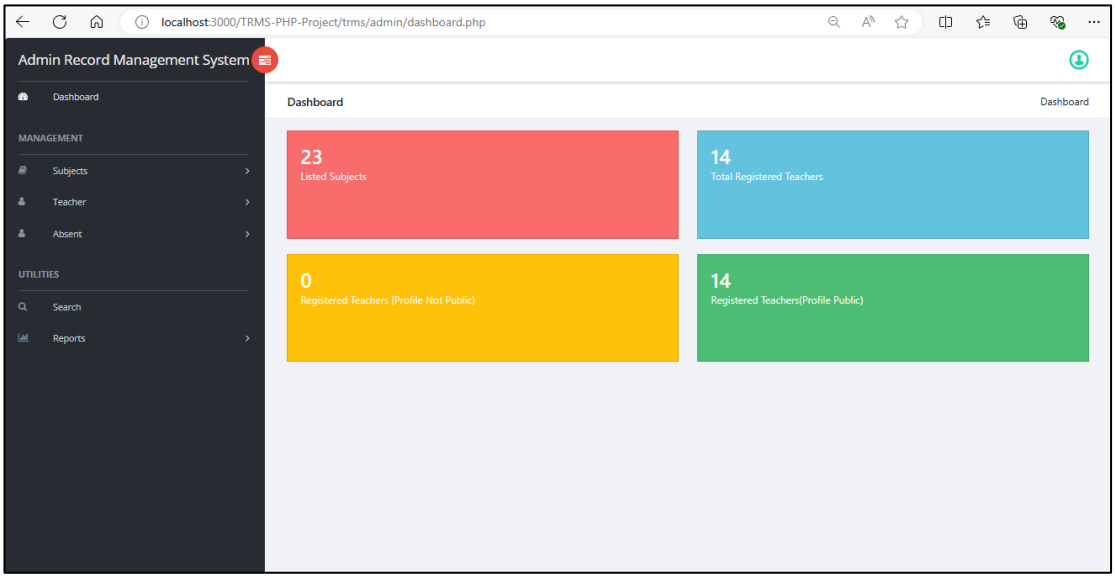

Figure 4.56: Admin Dashboard

4.4.1.24 Admin Add Subject Page

Purpose: To allow admins to add new subjects to the system.

Input: Subject name.

Output: A new subject is added to the database.

Design:

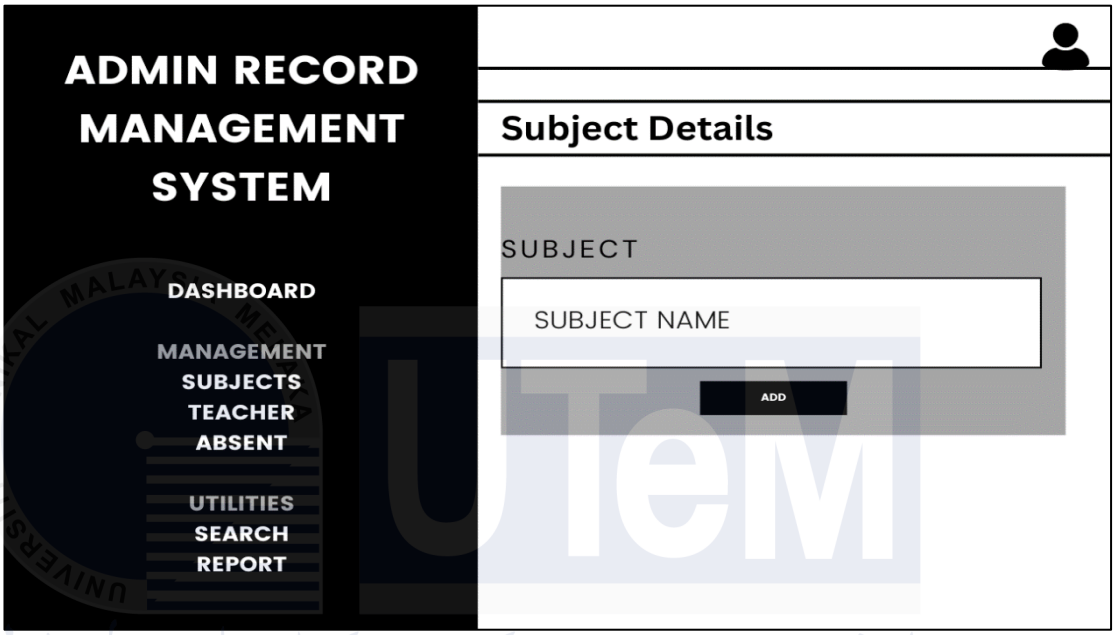

Figure 4.57: Admin Add Subject Page Design

Screen:

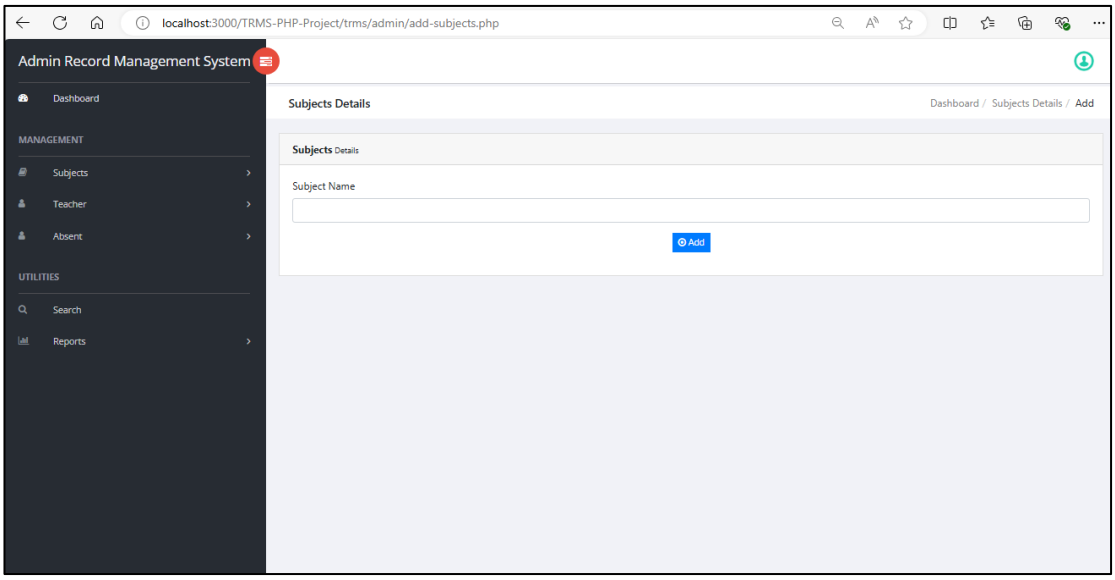

Figure 4.58: Admin Add Subject Page

4.4.1.25 Admin Manage Subject Page

Purpose: To allow admins to view and manage existing subjects in the system.

Input: -

Output: Displays and allows updates or deletion of subject details.

Design:

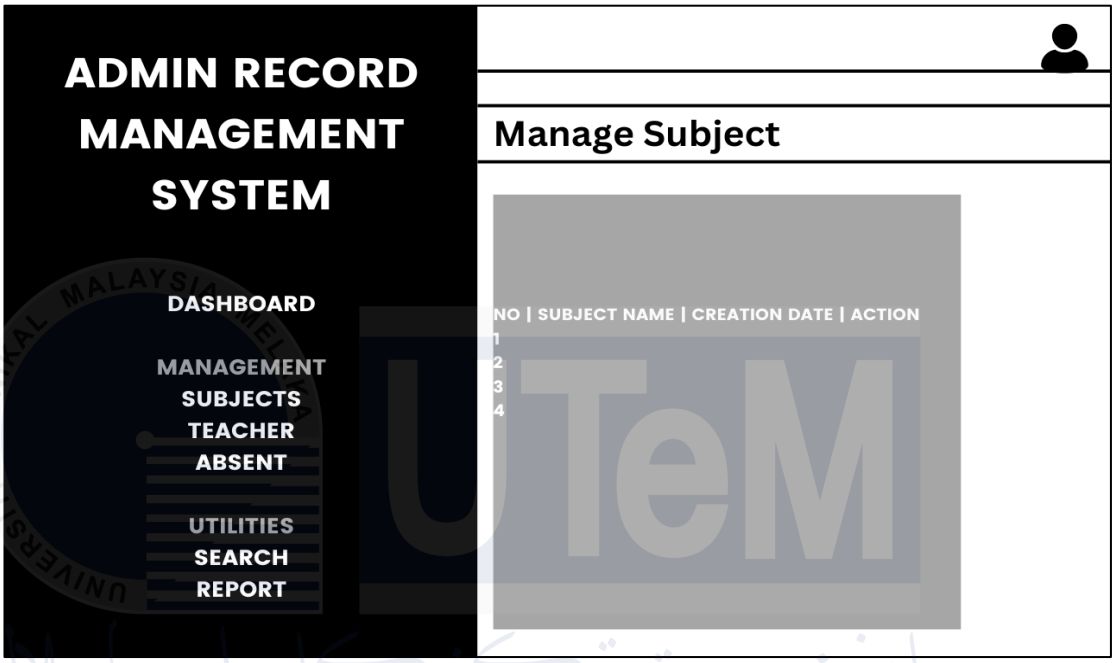

Figure 4.59: Admin Manage Subject Page Design

Screen:

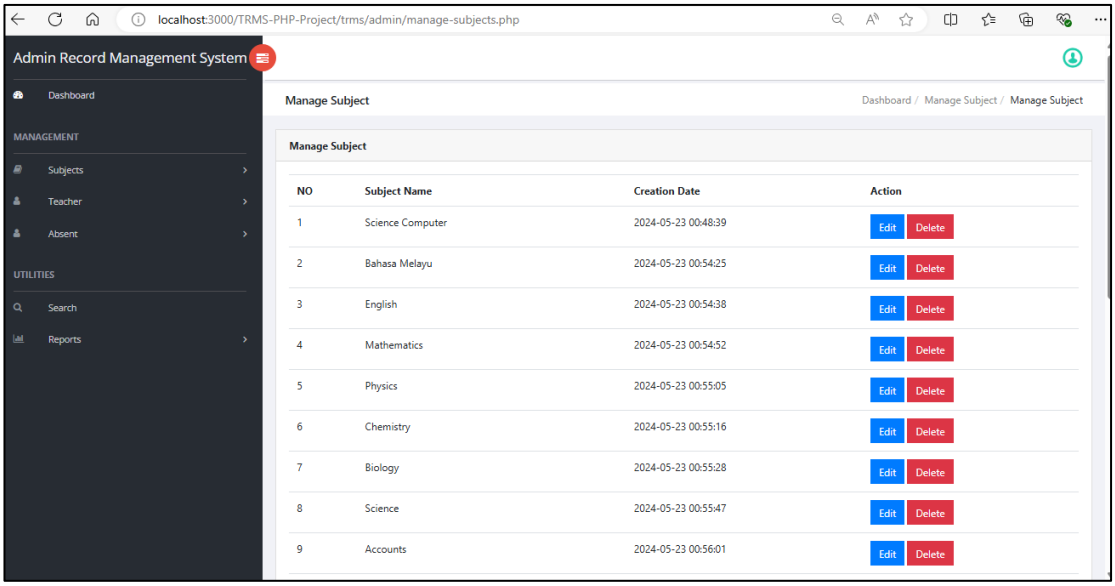

Figure 4.60: Admin Manage Subject Page

4.4.1.26 Admin Add Teacher Page

Purpose: To allow admins to add new teachers to the system.

Input: Teacher's personal and professional details.

Output: A new teacher record is created in the system.

Design:

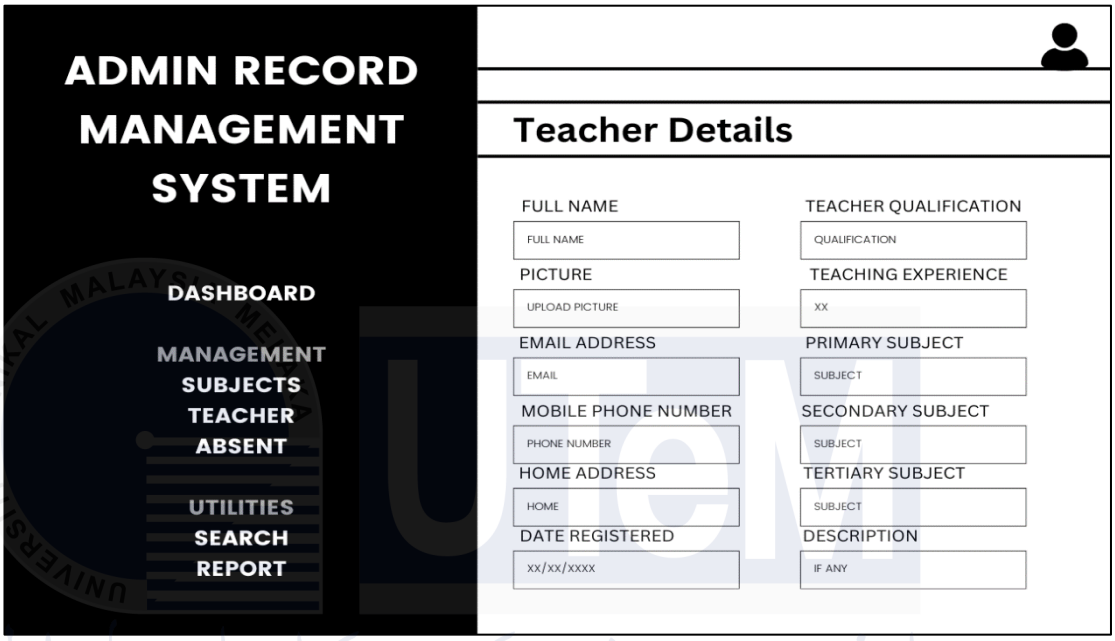

Figure 4.61: Admin Add Teacher Page Design

Screen:

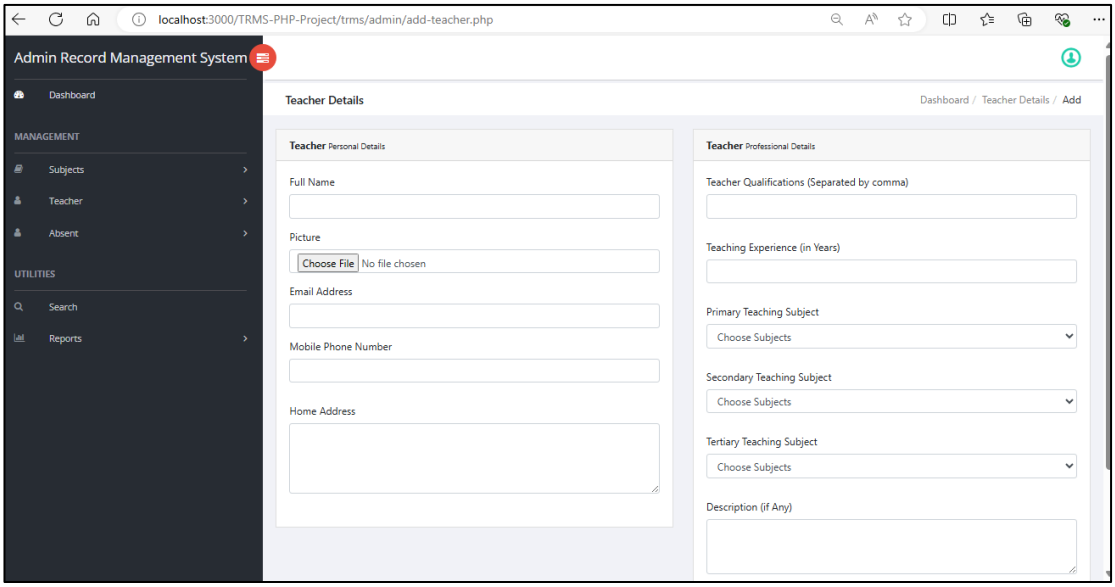

Figure 4.62: Admin Add Teacher Page

4.4.1.27 Admin Manage Teacher Page

Purpose: To allow admins to view and manage existing teachers in the system.

Input: Selection of a teacher from the list.

Output: Displays and allows updates or deletion of teacher details.

Design:

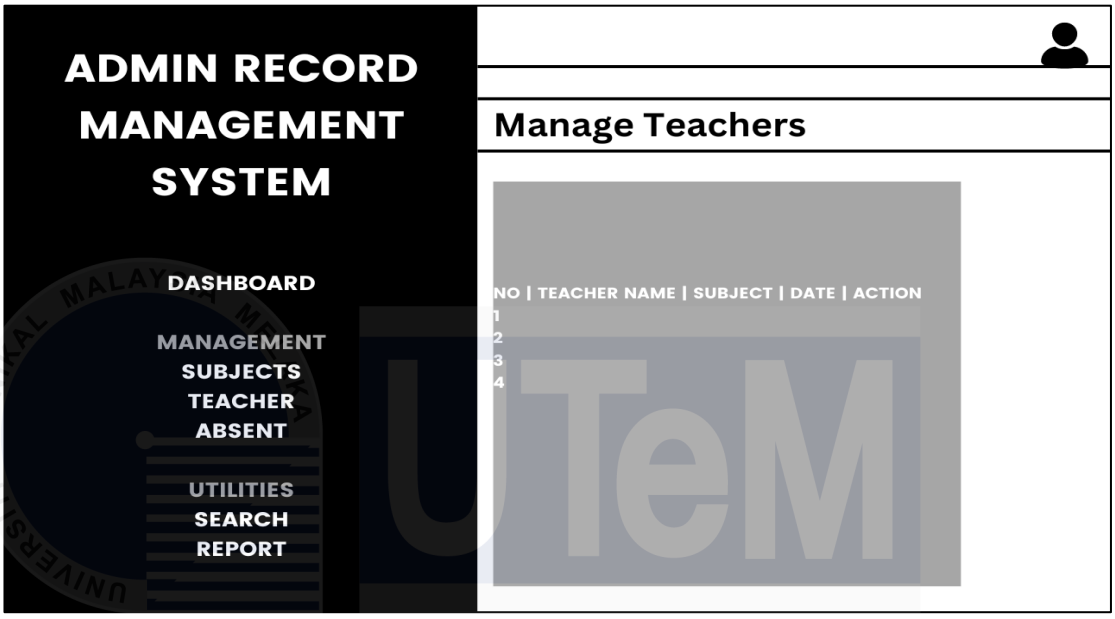

Figure 4.63: Admin Manage Teacher Page Design

Screen:

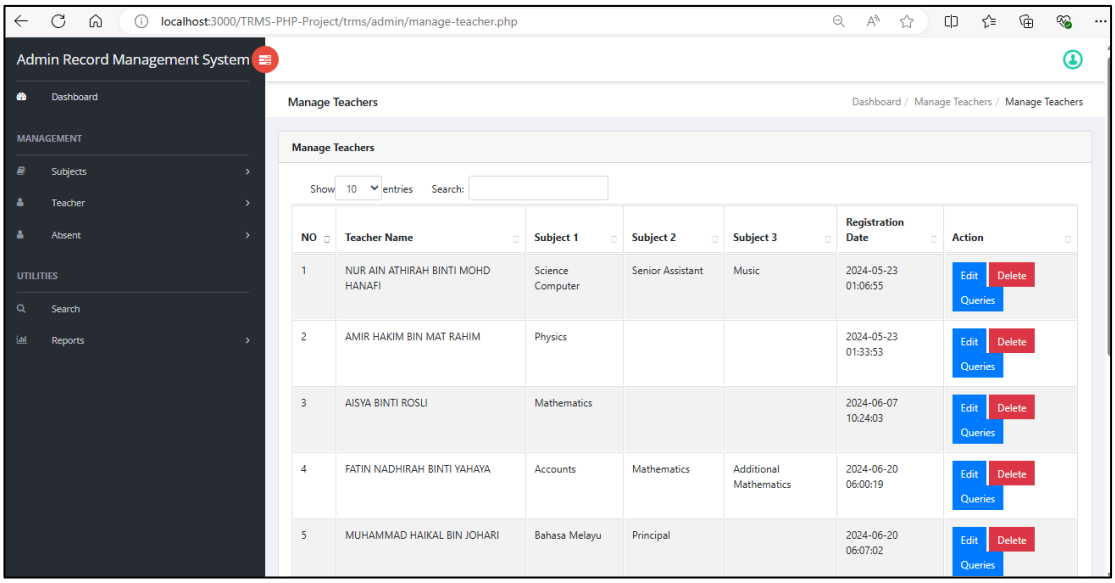

Figure 4.64: Admin Manage Teacher Page

4.4.1.28 Admin Manage Absence Page

Purpose: To allow admins to view and manage student absence records.

Input: -

Output: Displays the absence records and allows updates or deletion.

Design:

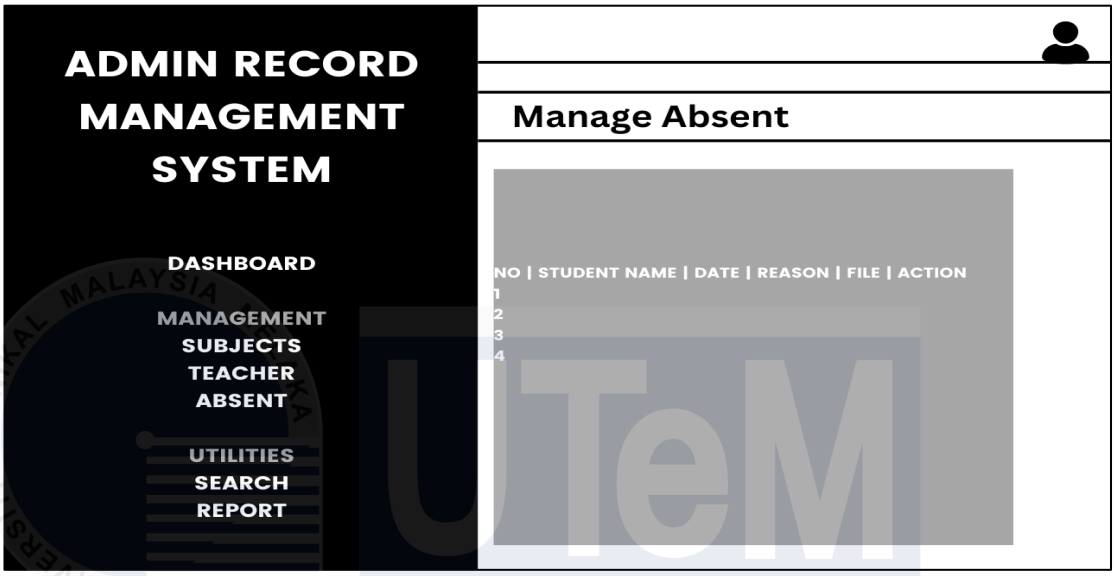

Figure 4.65: Admin Manage Absence Page Design

Screen:

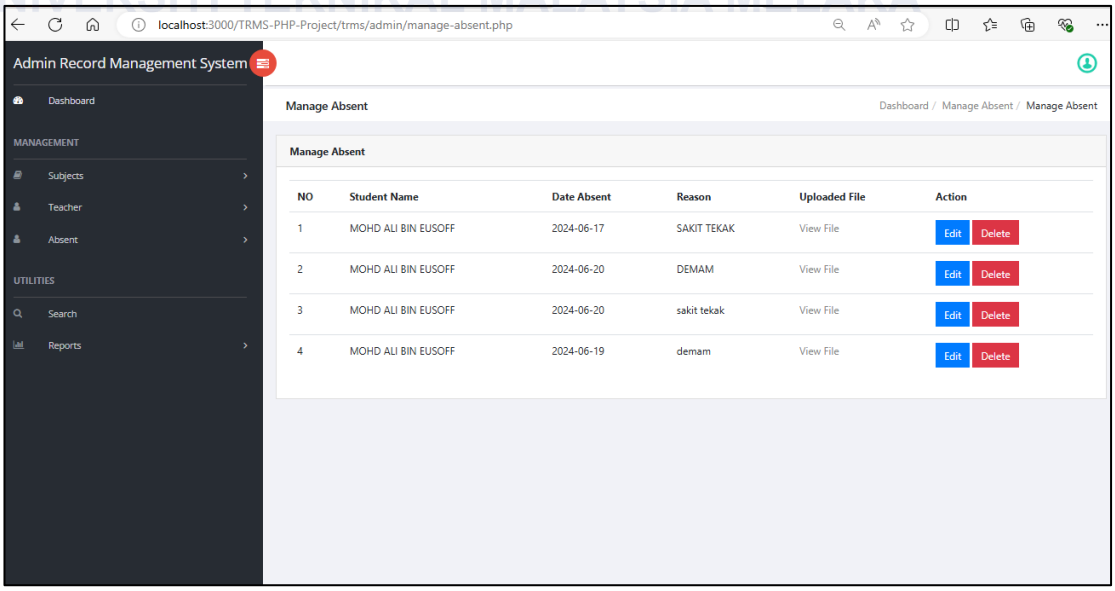

Figure 4.66: Admin Manage Absence Page

4.4.1.29 Admin Search Teacher Page

Purpose: To allow admins to search for teachers based on various criteria.

Input: Search criteria such as teacher name and subject.

Output: A list of teachers matching the search criteria.

Screen:

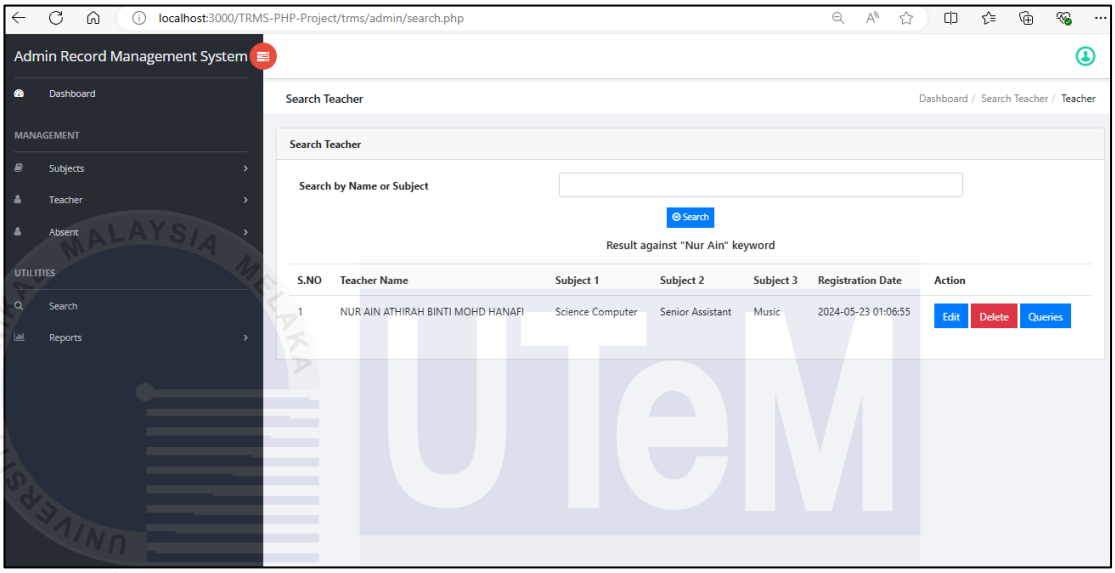

Figure 4.67: Admin Search Teacher Page

4.4.1.30 Admin Search Report of Subject by Date Page

Purpose: To allow admins to generate reports based on subject and date.

Input: Subject name and date range.

Output: A report is generated showing subject details and associated data within the specified date range.

Design:

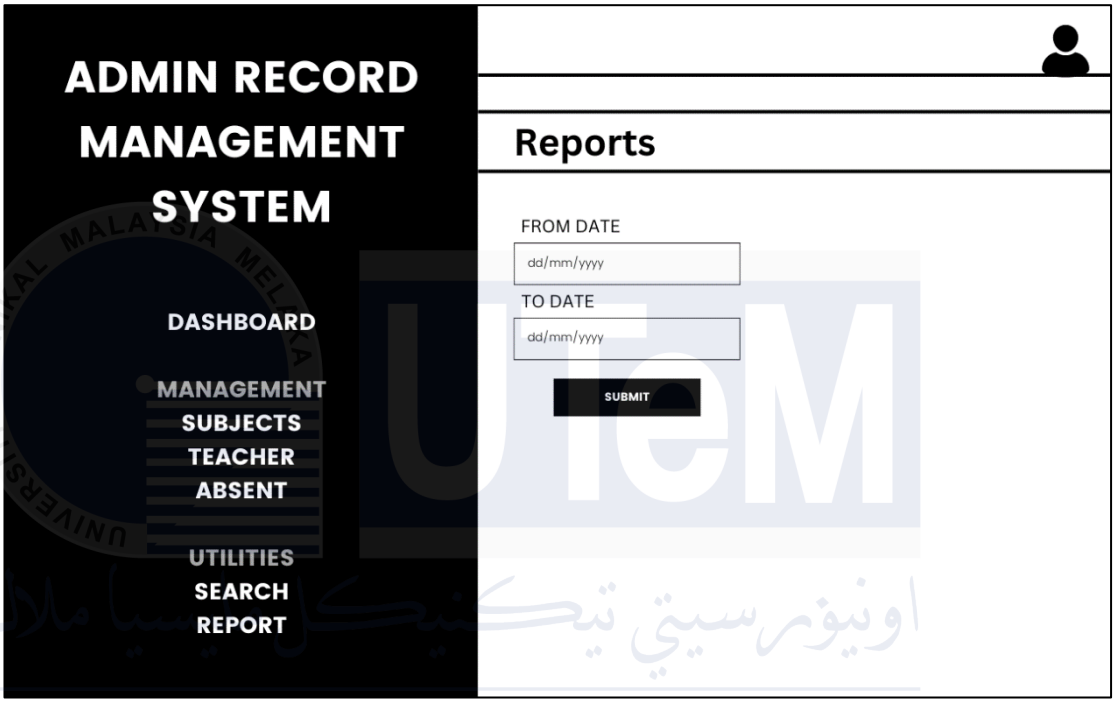

Figure 4.68: Admin Search Report of Subject by Date Page Design

Screen:

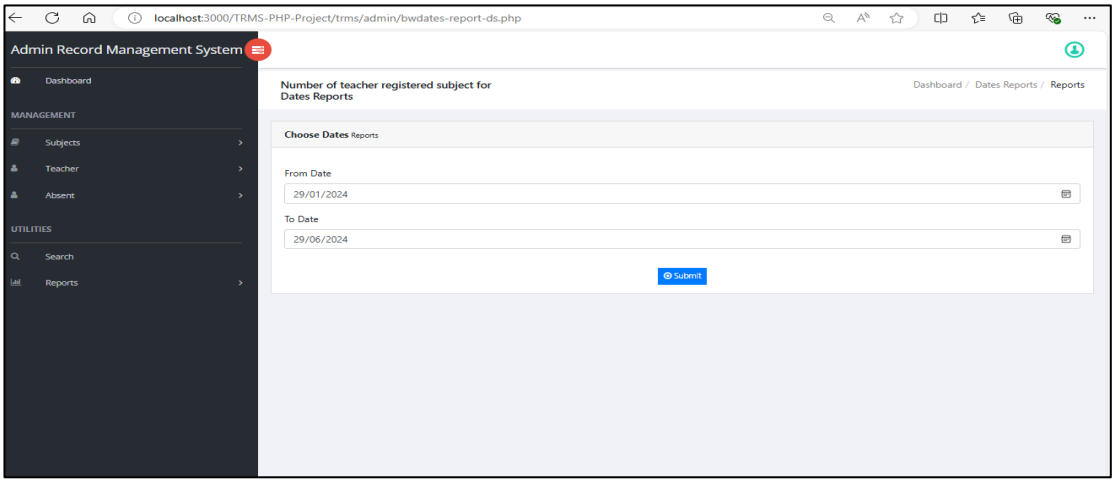

Figure 4.69: Admin Search Report of Subject by Date Page

4.4.1.31 Report by Graph Page

Purpose: To provide graphical representation of data such subject popularity.

Input: -

Output: A graph is generated displaying the data in a visual format.

Screen:

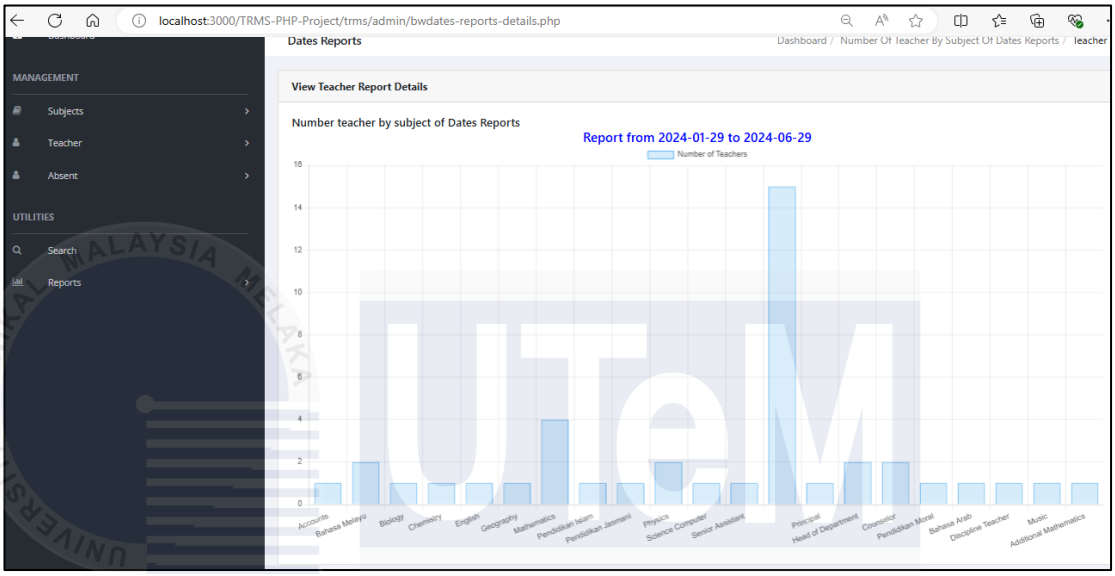

Figure 4.70: Report by Graph Page

4.3 Conclusion

In conclusion, this chapter covers the system architecture, early designs, and user interface design in great detail. The website design is determined throughout the design phase, aiming to create a standard application that provides an excellent user experience. The material presented in this chapter will be used in the next chapter, which is Implementation. The next chapter will discuss how the material from this chapter can be implemented into the system.

In the subsequent chapter, Chapter 5, the focus will shift from design to implementation. This chapter will detail the actual development process of the system, where the theoretical designs outlined in Chapter 4 are translated into practical, working code. It will include a comprehensive account of the technologies used, the challenges faced during the implementation, and the methods employed to overcome these obstacles. This progression from design to implementation is crucial to understanding how the theoretical plans are executed in a real-world setting, bringing the Teachers Record Management System to life.

CHAPTER 5: IMPLEMENTATION

5.1 Introduction

In this chapter, the process of database implementation for the Teachers Record Management System will be explained. A database is a structured collection of information stored digitally in a computer system, allowing for easy handling, updating, regulation, and organization of data. SQL is typically used for writing and querying data. A Database Management System (DBMS) manages and optimizes data storage and retrieval, providing a methodical approach to managing databases. For this system, MySQL will be used for development, with the implementation procedure encompassing database creation and installation.

5.2 Software Development Setup

For the Teachers Record Management System, the development setup must be configured before beginning the development of the web application. The project requires setting up a machine with an Apache web server, scripting language PHP, and a relational database managed through MySQL Workbench, which facilitates the creation and management of databases.

5.2.1 Step of Installation Setup

Refer Figure 5.1 until Figure 5.4 is how the database being installed in windows operating system:

Step 1: Download SQL Workbench Package installer from the system.

Link - https://dev.mysql.com/downloads/workbench/

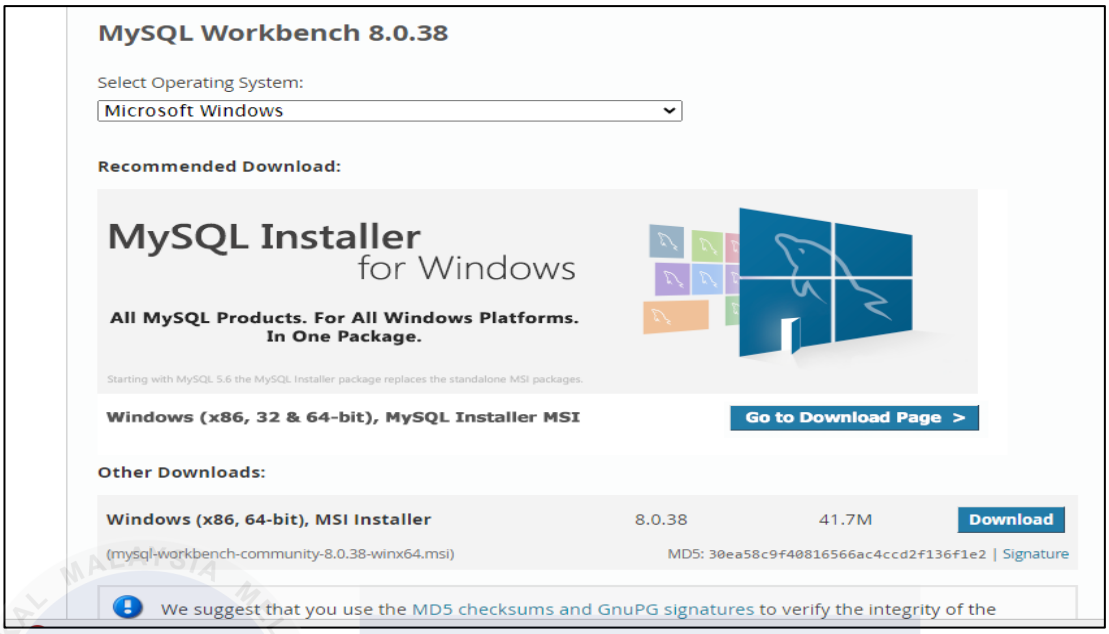

Figure 5.1 Download Page

Step 2: Locate the download destination folder and after that, make sure antivirus software that in laptop has been turn off before running the SQL Workbench.

Step 3: Click the installation package until the window above appears and click next.

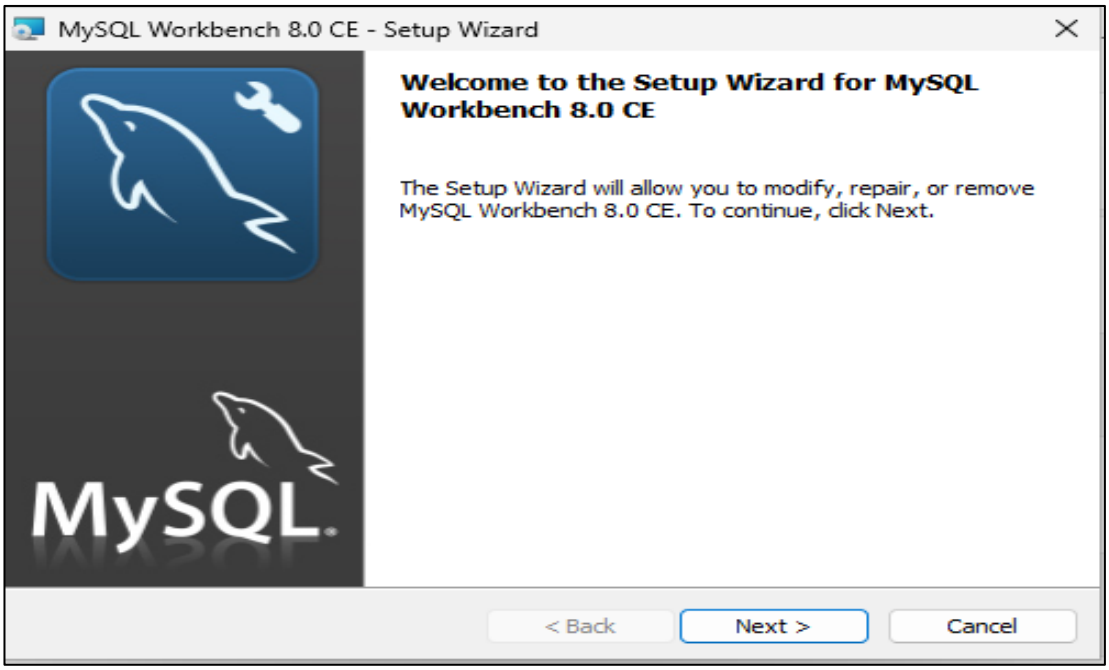

Figure 5.2 Setup Page

Step 4: Custom Setup and click next.

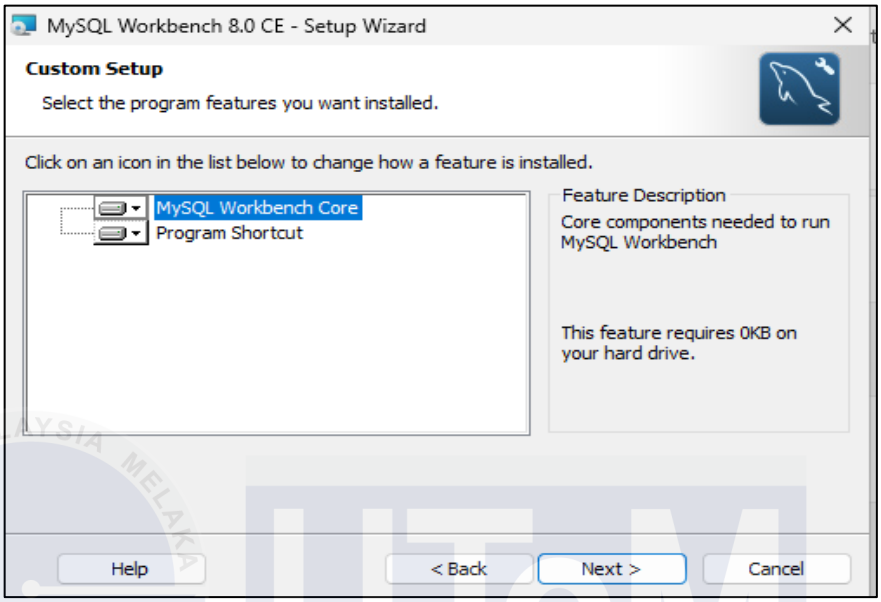

Figure 5.3 Custom Setup

Step 5: Choose the file destination folder for the installation and click finish.

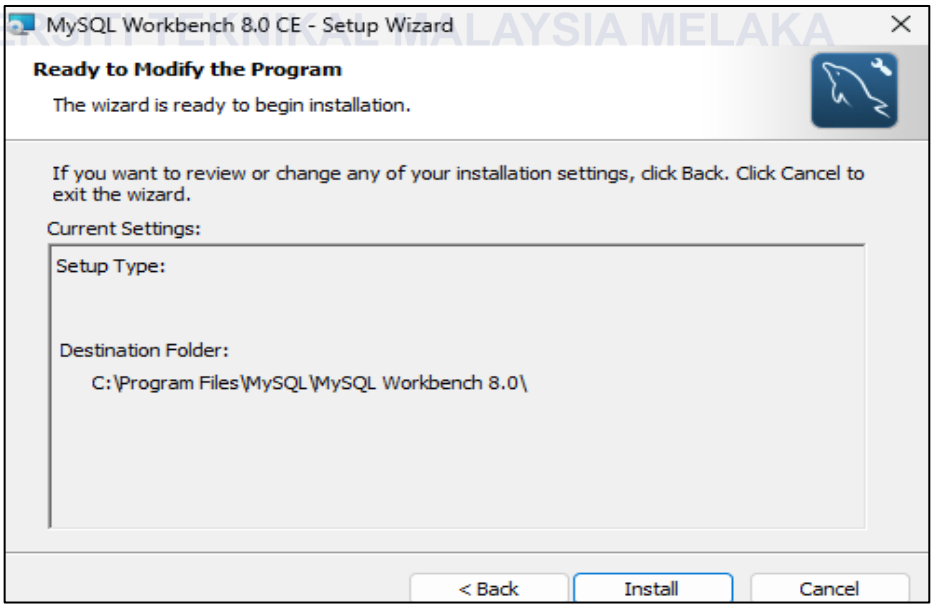

Figure 5.4 Installation Folder Page

5.2.2 Database Development

Database development is a critical aspect of the Teachers Record Management System, as it involves the creation and management of the system's data storage solutions. This section outlines the development process for the database, which was designed to efficiently handle and organize can refer **Figure 5.5 until Figure 5.11**.

5.2.2.1 Creation of Database Definition Language that complete at MySQL

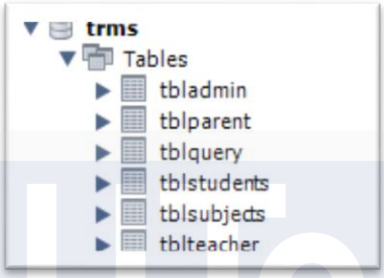

Figure 5.5 Table Creation

Figure above shows the creation of 6 tables that are successfully created on the MySQL.

5.2.2.1.1 Admin

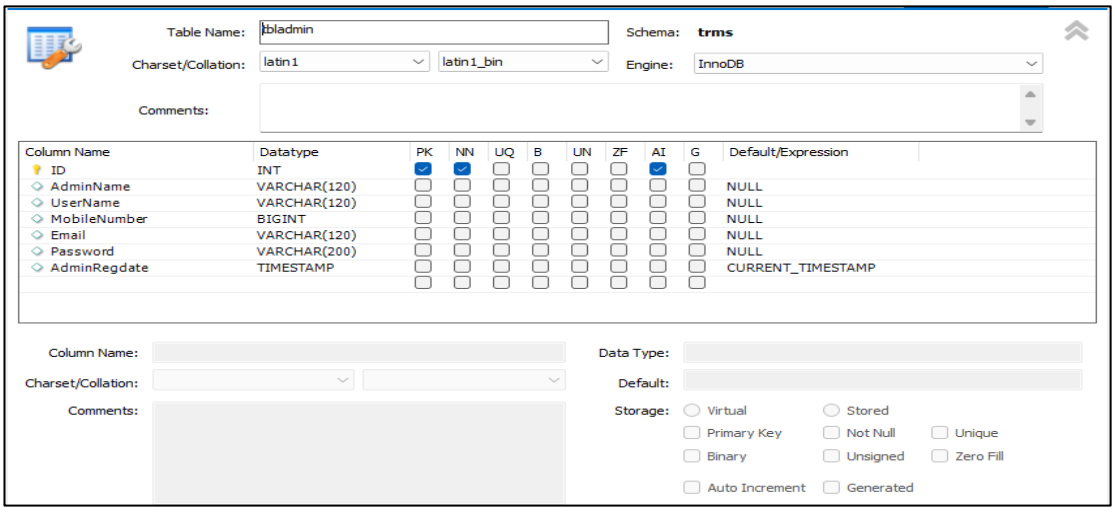

Figure 5.6 Admin structure

5.2.2.1.2 Parent

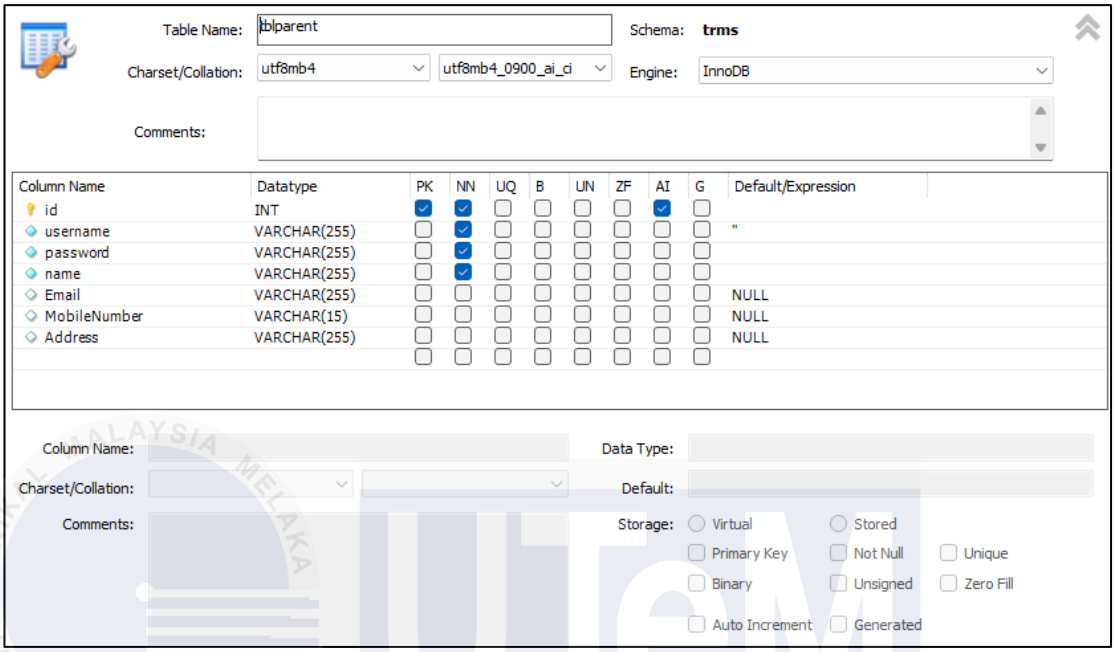

Figure 5.7 Parent structure

5.2.2.1.3 Query

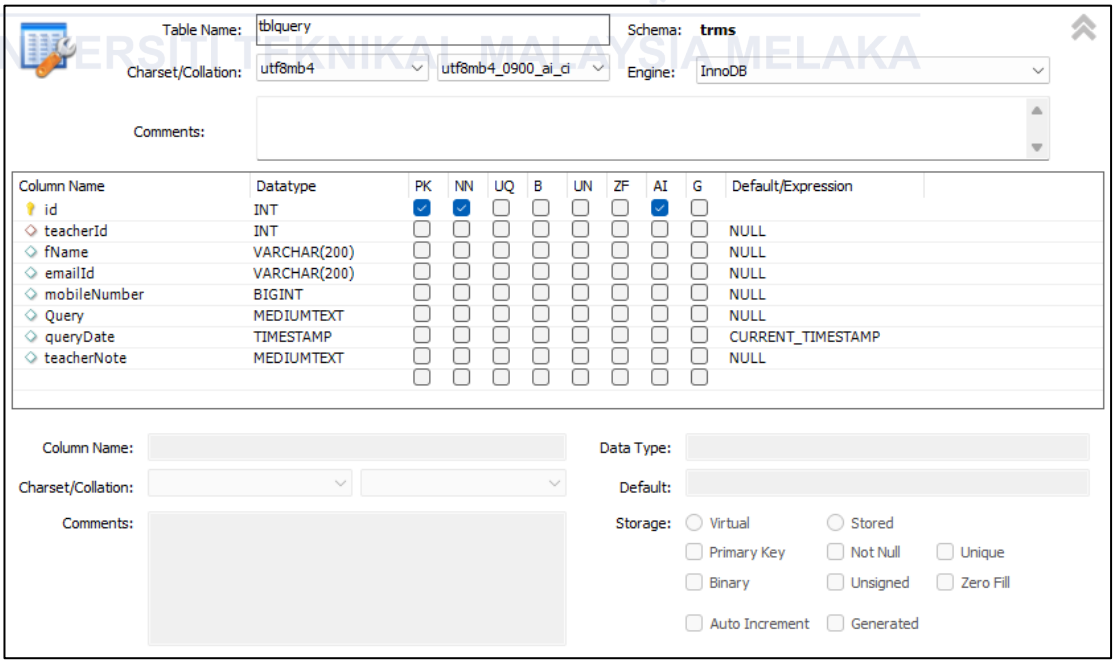

Figure 5.7 Query structure

5.2.2.1.4 Student

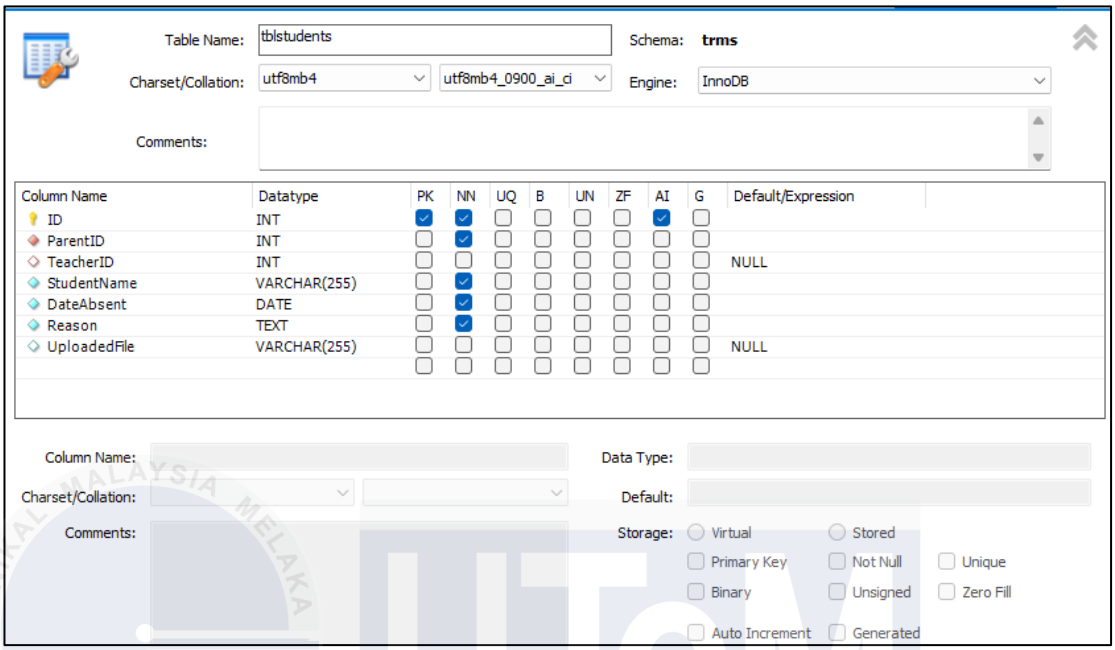

Figure 5.8 Student structure

5.2.2.1.5 Subject

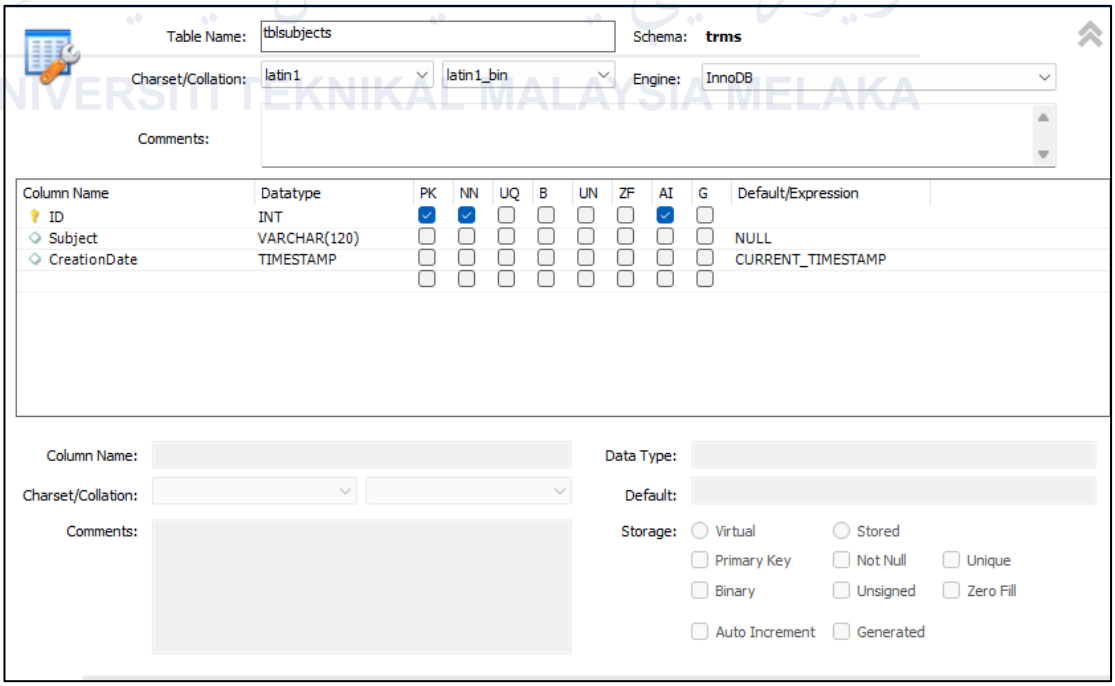

Figure 5.9 Subject structure

5.2.2.1.6 Teacher

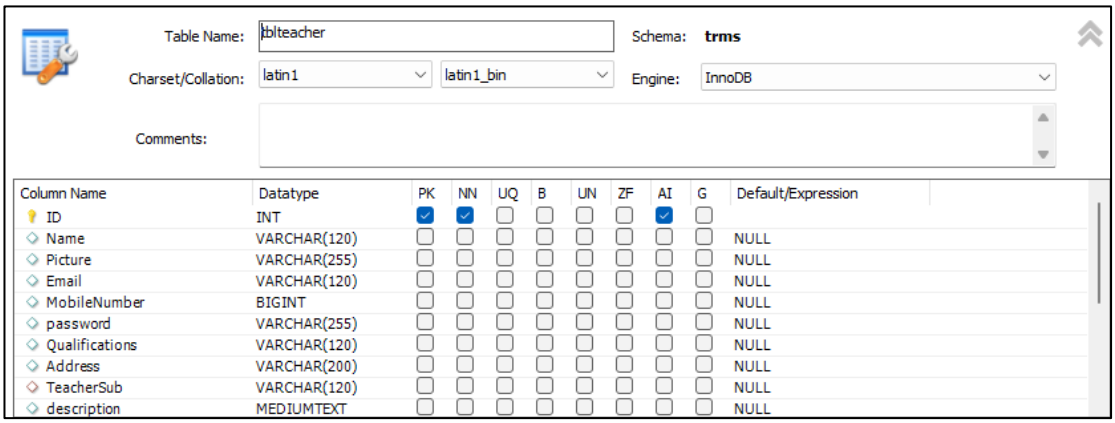

Figure 5.10 Teacher structure

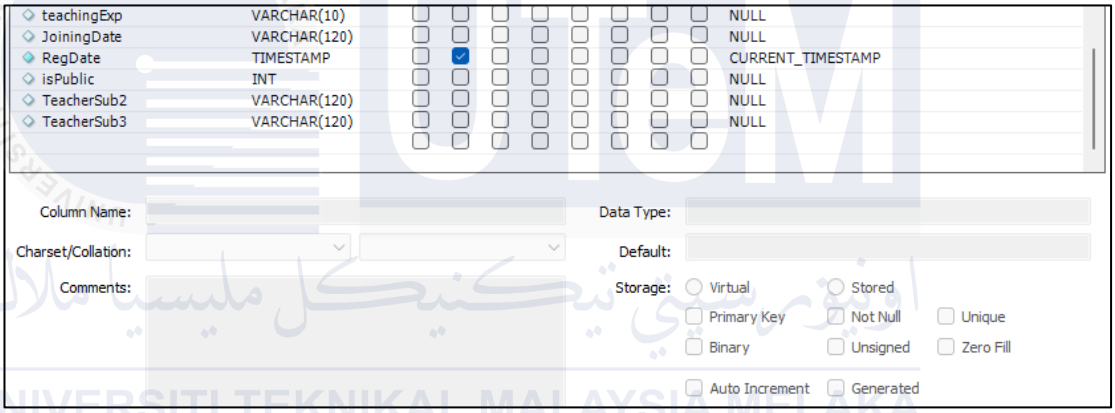

Figure 5.11 Teacher structure

5.3 Database Implementation

This section will briefly describe the Data Definition Language (DDL) used in the implementation of the Teachers Record Management System's database. Data Definition Language (DDL) is a subset of SQL used to define and manage database structures such as tables, indexes, and constraints. In the Teachers Record Management System, DDL commands were crucial in setting up the database schema, which includes creating tables, defining relationships, and establishing data integrity constraints.

5.3.1 Data Definition Language (DDL)

5.3.1.1 Admin

```
CREATE TABLE `tbladmin` (
  `ID` int NOT NULL AUTO_INCREMENT,
  `AdminName` varchar(120) DEFAULT NULL,
  `UserName` varchar(120) DEFAULT NULL,
  `MobileNumber` bigint DEFAULT NULL,
  `Email` varchar(120) DEFAULT NULL,
  `Password` varchar(200) DEFAULT NULL,
  `AdminRegdate` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  PRIMARY KEY (`ID`)
) ENGINE=InnoDB AUTO_INCREMENT=2 DEFAULT
CHARSET=latin1;
```

5.3.1.2 Parent

```
CREATE TABLE `tblparent` (
  `id` int NOT NULL AUTO_INCREMENT,
  `username` varchar(255) NOT NULL DEFAULT '',
  `password` varchar(255) NOT NULL,
  `name` varchar(255) NOT NULL,
  `Email` varchar(255) DEFAULT NULL,
  `MobileNumber` varchar(15) DEFAULT NULL,
  `Address` varchar(255) DEFAULT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=4 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
```

5.3.1.3 Query

```
CREATE TABLE `tblquery` (
  `id` int NOT NULL AUTO_INCREMENT,
  `teacherId` int DEFAULT NULL,
```

```
  `fName` varchar(200) DEFAULT NULL,
  `emailId` varchar(200) DEFAULT NULL,
  `mobileNumber` bigint DEFAULT NULL,
  `Query` mediumtext,
  `queryDate` timestamp NULL DEFAULT CURRENT_TIMESTAMP,
  `teacherNote` mediumtext,
  PRIMARY KEY (`id`),
  KEY `tid` (`teacherId`),
  CONSTRAINT `tid` FOREIGN KEY (`teacherId`) REFERENCES
`tblteacher` (`ID`)
) ENGINE=InnoDB AUTO_INCREMENT=9 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
```

5.3.1.4 Student

```
CREATE TABLE `tblstudents` (
  `ID` int NOT NULL AUTO_INCREMENT,
  `ParentID` int NOT NULL,
  `TeacherID` int DEFAULT NULL,
  `StudentName` varchar(255) NOT NULL,
  `DateAbsent` date NOT NULL,
  `Reason` text NOT NULL,
  `UploadedFile` varchar(255) DEFAULT NULL,
  PRIMARY KEY (`ID`),
  KEY `ParentID` (`ParentID`),
  KEY `fk_student_teacher` (`TeacherID`),
  CONSTRAINT `fk_absent_parent` FOREIGN KEY
(`ParentID`) REFERENCES `tblparent` (`id`),
  CONSTRAINT `fk_student_teacher` FOREIGN KEY
(`TeacherID`) REFERENCES `tblteacher` (`ID`) ON DELETE
SET NULL
) ENGINE=InnoDB AUTO_INCREMENT=9 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
```

5.3.1.5 Subject

```
CREATE TABLE `tblsubjects` (
  `ID` int NOT NULL AUTO_INCREMENT,
  `Subject` varchar(120) DEFAULT NULL,
  `CreationDate` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  PRIMARY KEY (`ID`),
  KEY `Subject` (`Subject`)
) ENGINE=InnoDB AUTO_INCREMENT=43 DEFAULT
CHARSET=latin1;
```

5.3.1.6 Teacher

```
CREATE TABLE `tblteacher` (
  `ID` int NOT NULL AUTO_INCREMENT,
  `Name` varchar(120) DEFAULT NULL,
  `Picture` varchar(255) DEFAULT NULL,
  `Email` varchar(120) DEFAULT NULL,
  `MobileNumber` bigint DEFAULT NULL,
  `password` varchar(255) DEFAULT NULL,
  `Qualifications` varchar(120) DEFAULT NULL,
  `Address` varchar(200) DEFAULT NULL,
  `TeacherSub` varchar(120) DEFAULT NULL,
  `description` mediumtext,
  `teachingExp` varchar(10) DEFAULT NULL,
  `JoiningDate` varchar(120) DEFAULT NULL,
  `RegDate` timestamp NOT NULL DEFAULT
CURRENT_TIMESTAMP,
  `isPublic` int DEFAULT NULL,
  `TeacherSub2` varchar(120) DEFAULT NULL,
  `TeacherSub3` varchar(120) DEFAULT NULL,
  PRIMARY KEY (`ID`),
  KEY `subname` (`TeacherSub`),
  CONSTRAINT `subname` FOREIGN KEY (`TeacherSub`)
REFERENCES `tblsubjects` (`Subject`)
```

```
) ENGINE=InnoDB AUTO_INCREMENT=22 DEFAULT
CHARSET=latin1;
```

5.3.2 Data Manipulation Language (DML)

Data Manipulation Language (DML) is a subset of SQL used to manipulate and interact with data within the database. In the Teachers Record Management System, DML commands play a critical role in managing the data stored in the database, allowing for operations such as inserting new records, updating existing information, deleting records, and retrieving data.

5.3.2.1 Admin

```
INSERT INTO `tbladmin` VALUES
(1,'Admin','admin',115687483,'adminuser@gmail.com','edf
559915c178c96ff6cb994708c634a','2019-10-04 06:10:04');
```

5.3.2.2 Parent

```
INSERT INTO `tblparent` VALUES
(1,'','a98ae40c32a8a6b0dcdf1a86e459b4bc','MOHD HANAFI
BIN HUSSIN','hanafi@gmail.com','0169355138','No 5,
LORONG RASAU PERDANA 5,\r\nJALAN KUANTAN- PEKAN'),
(2,'','0449f192ea94663c766f590cd7a14053','JUNAINAH
BINTI IBRAHIM','junainah@gmail.com','0197910074','No 5,
LORONG RASAU PERDANA 5,\r\nJALAN KUANTAN- PEKAN'),
(3,'','eeec9baf396dc541acf5a30515c983a3','JULIZAAZWANI
IBRAHIM','juliza@gmail.com','0197510074','167 PANCHING
TIMUR');
```

5.3.2.3 Query

```
INSERT INTO `tblquery` VALUES
(4,5,'NUR ALYAA BALQIS','alyaa@gmail.com',198765432,'I
really want to learn something new with you
teacher.','2024-05-22 17:30:39','Really appreciate.'),
```

```
(5,5,'KHAIRUNNISA
AUNI','khai@gmail.com',111245998,'Really want to learn
with you.','2024-06-15 20:40:11',NULL),
(6,14,'NADHIRA
ADIBAH','nadhiraadibah@gmail.com',156489565,'I am happy
to learn with you.','2024-06-20 00:48:36',NULL),
(7,19,'AMIRUL','amirul@gmail.com',125653122,'I want to
learn with you','2024-06-20
01:04:36','Sure!'),(8,20,'xx','xx@gmail.com',123456789,
'wanted to learn with you','2024-06-20
10:05:04','SURE!');
```

5.3.2.4 Student

```
INSERT INTO `tblstudents` VALUES
(4,2,NULL,'MOHD ALI BIN EUSOFF','2024-06-17','SAKIT
TEKAK','SENARAI’.pdf'),
(5,1,19,'MOHD ALI BIN EUSOFF','2024-06-
20','DEMAM','SENARAI’.pdf'),
(6,1,19,'MOHD ALI BIN EUSOFF','2024-06-20','sakit
tekak','surat tak hadir.docx'),
(7,1,5,'MOHD ALI BIN EUSOFF','2024-06-
19','demam','surat tak hadir.docx');
```

5.3.2.5 Subject

```
INSERT INTO `tblsubjects` VALUES
(15,'Science Computer','2024-05-22 16:48:39'),
(16,'Bahasa Melayu','2024-05-22 16:54:25'),
(17,'English','2024-05-22 16:54:38'),
(18,'Mathematics','2024-05-22 16:54:52'),
(19,'Physics','2024-05-22 16:55:05'),
(20,'Chemistry','2024-05-22 16:55:16'),
(21,'Biology','2024-05-22 16:55:28'),
(22,'Science','2024-05-22 16:55:47'),
(23,'Accounts','2024-05-22 16:56:01'),
```

```
(24,'Pendidikan Islam','2024-05-22 16:56:19'),
(25,'Pendidikan Moral','2024-05-22 16:56:30'),
(26,'Tasawur','2024-05-22 16:57:14'),
(31,'Additional Mathematics','2024-06-19 21:25:56'),
(32,'Geography','2024-06-19 21:30:31'),
(33,'Design and Technology','2024-06-19 21:31:37'),
(34,'Pendidikan Jasmani','2024-06-19 21:32:30'),
(35,'Music','2024-06-19 21:32:55'),
(36,'Bahasa Arab','2024-06-19 21:33:35'),
(37,'Principal','2024-06-19 21:33:57'),
(38,'Senior Assistant','2024-06-19 21:34:52'),
(39,'Head of Department','2024-06-19 21:35:26'),
(40,'Discipline Teacher','2024-06-19 21:35:50'),
(41,'Counselor','2024-06-19 21:36:04');
```

5.3.2.6 Teacher

```
INSERT INTO `tblteacher` VALUES
(5,'NUR AIN ATHIRAH BINTI MOHD HANAFI'
,'ae539bd3318c9e1f7f0a930bce4c949d1718836485.jpg','aina
thirah174@gmail.com',123456789,'edf559915c178c96ff6cb99
4708c634a','Bachelor\'s degree in Computer Science
(Database Management)','No 5, LORONG RASAU PERDANA
5,\r\nJALAN KUANTAN- PEKAN','Science Computer','I am an
enthusiastic and dedicated educator specializing in
science and computer education. With a passion for
technology and a commitment to fostering a love for
learning, I bring over [number] years of teaching
experience to my students. My goal is to prepare them for
a future where science and technology play an integral
role in every aspect of life.\r\n\r\nTeaching
Philosophy:\r\nI believe that the best learning happens
when students are actively engaged and curious. My
teaching philosophy centers around hands-on, project-
based learning where students can experiment, explore,
```

and create. By integrating real-world applications and interdisciplinary approaches, I aim to make science and computer studies relevant and exciting for all my students.\r\n\r\nProfessional Background:\r\nI hold a Bachelor\'s degree in Computer Science from Universiti Teknikal Malaysia, Melaka. I regularly participate in professional development workshops and conferences to stay at the forefront of educational innovations in science and technology.\r\n\r\nClassroom Environment:\r\nIn my classroom, I cultivate a culture of inquiry, collaboration, and creativity. Equipped with modern technology and resources, my classroom is a dynamic space where students can engage in coding, robotics, and scientific experiments. I prioritize creating an inclusive environment where every student feels empowered to contribute and explore their interests in science and computers.\r\n\r\nExtracurricular Involvement:\r\nBeyond the classroom, I lead several extracurricular activities, including the coding club, robotics team, and science Olympiad. These programs provide students with opportunities to deepen their knowledge, develop teamwork skills, and participate in competitions.\r\n\r\nContact Information:\r\nI believe in maintaining open and effective communication with parents and guardians. Please feel free to reach out to me via email at ainathirah174@gmail.com to discuss your child\'s progress or any concerns you might have. I am always here to support my students\' growth and success.\r\n','2','2024-05-23','2024-05-22 17:06:55',1,'Senior Assistant','Music'),
(6,'AMIR HAKIM BIN MAT RAHIM','c879a57a3426329bc74396f7acd984f81718834983.jpg','amirhakim@gmail.com',152649875,'4e72fc71d6afe049572655387d0f5346','Bachelor\'s degree in Mechanical Engineering','JALAN TASIK UTAMA 60, TAMAN TASIK UTAMA,

```
AYER KEROH, MELAKA TENGAH, 75450, MELAKA','Physics','I am a passionate and dedicated physics teacher with a commitment to inspiring students to explore the wonders of the physical world. With over 4 years of experience in teaching physics, I strive to make complex concepts accessible and engaging for all my students.','4','2024-05-23','2024-05-22 17:33:53',1,NULL,NULL),
(8,'AISYA BINTI ROSLI','c84ebd90cc116ae6ef90f1dca59e458c1717727412.jpg','xx@gmail.com',123456789,'063b77ed96e433f605c772d59dbd2a73','Bachelor\'s degree in Computer Science','JALAN TASIK UTAMA 60, TAMAN TASIK UTAMA, AYER KEROH, MELAKA TENGAH, 75450, MELAKA','Mathematics','XX','4','2024-06-03','2024-06-07 02:24:03',1,NULL,NULL),
(11,'FATIN NADHIRAH BINTI YAHAYA','f5d1ad2f93294d1fa9b08b484005f0131718836520.jpg','fatin@gmail.com',179715251,NULL,'Bachelor Degree in Accountant','NO 166, FELDA PANCHING TIMUR, KUANTAN PAHANG','Accounts','Hello, students! My name is Teacher Fatin, and I am excited to be your account and mathematics teacher this year. I have been teaching for 4 years, and I am passionate about helping my students learn and grow.','4','2024-05-27','2024-06-19 22:00:19',1,'Mathematics','Additional Mathematics'),
(12,'MUHAMMAD HAIKAL BIN JOHARI','6ff79cf7ca446ea5f1fd5d54e45c40401718836551.jpg','haikal@gmail.com',107005427,'120bfe651a1fdbd1d45c2790216acbeb','Bachelor Degree in Malay Language','TAMAN SCIENTEX, DURIAN TUNGGAL','Bahasa Melayu','I have been teaching Bahasa Melayu for over 10 years, specializing in high school. My teaching philosophy emphasizes problem-solving skills and real-world applications of concepts. I enjoy incorporating hands-on activities and technology into my lessons to engage students and promote deeper
```

```
understanding. ','10','2024-03-07','2024-06-19
22:07:02',1,'Principal',''),
(13,'AFFI SYAHFIZAL BIN ABDULLAH'
,'49627447fb5c3dc374bf8215ce7f8dd61718836847.jpg','affi
@gmail.com',113691947,'f7b134485fbf95dadb1a234e4e505531
','Ph.D. in Genetics and an M.Sc. in Biology','TAMAN
SCIENTEX, DURIAN TUNGGAL','Biology','Dedicated Biology
educator with over 15 years of experience in inspiring
students to explore the wonders of life sciences. Holding
a Ph.D. in Genetics and an M.Sc. in Biology, brings a
deep understanding of biological concepts and a passion
for teaching.','15','2024-05-29','2024-06-19
22:40:07',1,'Head of Department',''),
(14,'NUR AZMA HANANI BINTI MOHD AZAMI'
,'773e0a701a8c2dba6912d18b3ebcf6871718837219.jpg','azma
@gmail.com',133255466,'588c1bbf8b50f6cca03fda11b15074a6
',' B.Sc. in Chemistry and an M.Ed. in Education','TAMAN
SCIENTEX, DURIAN TUNGGAL','Chemistry','Passionate
Chemistry educator with over 5 years of experience in
guiding students through the intricacies of chemical
concepts. With a strong educational background including
a B.Sc. in Chemistry and an M.Ed. in Education, I am
combines academic rigor with innovative teaching methods.
My teaching philosophy revolves around fostering
curiosity, critical thinking, and practical application
of chemistry principles. ','5','2024-06-20','2024-06-19
22:46:18',1,'Counselor',''),
(15,'NUR AISYAH NABILA BINTI KHAIRUL HISHAM'
,'bb208e89d04ca70cbf8cbecc2cee7c821718837522.jpg','aisy
ah@gmail.com',116106375,'797c10d5bc91cc8ed86b233f6f1680
54','M.A. in Geography and a B.Ed. in Education','No 61,
Taman Sejahtera','Geography','A dedicated Geography
educator with a passion for exploring the world through
maps, cultures, and landscapes. Holding an M.A. in
Geography and a B.Ed. in Education, me brings a wealth
```

of academic knowledge and teaching expertise to my classroom. My teaching approach combines theoretical insights with practical applications, encouraging students to think critically about global issues and their geographical contexts. ','6','2024-06-06','2024-06-19 22:51:09',1,'',''),
(16,'YAP ZHI XUAN','08b6d4e3e4886b17ad2e2e426d35bce71718837882.jpg','yuki@gmail.com',163222092,'6131be25f1a737adffdbea74e5e1cfa7','M.A. in English Literature, B.Ed. in Education','JALAN TASIK UTAMA 60, TAMAN TASIK UTAMA, AYER KEROH, MELAKA TENGAH, 75450, MELAKA','English','Passionate English educator dedicated to nurturing students\' love for literature, language, and critical thinking. With a Master\'s degree in English Literature and a Bachelor\'s in Education, I want to bring a deep understanding of literary works and educational pedagogy to his teaching. My approach blends traditional and modern methods to engage students in exploring classic and contemporary texts, analyzing themes, and developing writing skills.','2','2024-05-30','2024-06-19 22:57:23',1,'Pendidikan Moral',''),
(17,'YASMINE HENRY','78cffa19dab71b3d5ebe857b9a7fc58d1718838162.jpg','yasmine@gmail.com',138967519,'bb48c3d8b94635fd71421f7f39e795e2','Bachelor\'s degree in Physical Education and a Master\'s in Sports Psychology','Jalan Tu 60, Taman Tasik Utama, Ayer Keroh, Melaka Tengah, 75450, Melaka, MYS\r\nUNIVERSITI TEKNIKAL MALAYSIA MELAKA','Pendidikan Jasmani','A dynamic Physical Education teacher dedicated to promoting fitness, health, and sportsmanship among students. With a Bachelor\'s degree in Physical Education and a Master\'s in Sports Psychology, I want to brings a wealth of knowledge in both physical fitness and mental resilience. Her teaching philosophy emphasizes holistic

```
development through sports, focusing on teamwork, leadership skills, and physical fitness.','6','2024-05-26','2024-06-19 23:01:42',1,'Head of Department',''),
(18,'DINA SOFEA BINTI HILMY','ad83404d78087fe74e763cdb9207f5221718838832.jpg','dina@gmail.com',133509694,'5f96dc87a7e890271fe532e0ce9e20b4','Bachelor\'s in Islamic Studies, Master\'s in Islamic History','No 5, LORONG GUDANG PERDANA 5, KUANTAN','Pendidikan Islam','Dedicated Islamic Studies teacher with over 10 years of experience in imparting knowledge about Islamic history, culture, and traditions. Holds a Bachelor\'s degree in Islamic Studies and a Master\'s degree in Islamic History, bringing deep insights into the rich heritage of Islam.','10','2024-05-30','2024-06-19 23:13:25',1,'Bahasa Arab',''),
(19,'AQMARRAFIQ BIN MOHD RIZAL','fecb74620ded5c471b4d93aa8e1eda0b1718845154.jpg','ferg@gmail.com',123540879,'ee32d2c6cf56263ccac6f272663f4333','Bachelor of Education (Hons.) in Bahasa Melayu','TAMAN SCIENTEX, DURIAN TUNGGAL','Bahasa Melayu','I am an experienced Bahasa Melayu teacher dedicated to helping students understand and master Bahasa Melayu effectively. My extensive teaching experience has enriched my knowledge in developing engaging and relevant teaching materials tailored to students\' needs. I actively participate in professional development courses to enhance my teaching proficiency.\r\n\r\n','5','2024-03-19','2024-06-20 00:54:23',1,'Discipline Teacher',''),
(20,'GEOGINA CARYN ANAK JIMMY','012e31a8b032f2f8c34e9a7a39cbf13a1718877597.jpg','gina@gmail.com',197563201,'4e9d2f84257a720c33b9a4563ae93270','xx','JALAN TASIK UTAMA 5, TAMAN TASIK UTAMA, AYER KEROH, MELAKA TENGAH, 75450,
```

```
MELAKA','Mathematics','xxx','3','2024-06-20','2024-06-
20 09:54:24',1,'','');
```

5.4 Conclusion

In this chapter, we delved into the implementation phase of the Teachers Record Management System, focusing on the database setup and the critical role of SQL in managing data within the system. The database implementation involved creating a robust and structured data storage solution using MySQL, ensuring that the system can efficiently handle the various operations related to managing teacher records, student absences, and parent interactions. The use of Data Definition Language (DDL) facilitated the creation of the necessary database schema, while Data Manipulation Language (DML) provided the tools for interacting with the data, ensuring the system remains dynamic and responsive to the needs of its users.

Transition to Chapter 6, the focus will shift to the testing phase of the Software Development Life Cycle (SDLC), building on the methodologies discussed in Chapter 2. Chapter 6 will detail the test plan, including the organization of testing roles, the setup of the test environment, and the scheduling of tests. This phase is crucial for validating the functionality, security, and reliability of the system. The chapter will also discuss the test strategy, which will outline the techniques used to identify and address system bugs, ensuring that the Teachers Record Management System meets all specified requirements and operates seamlessly for its users.

CHAPTER 6: TESTING

6.1 Introduction

This chapter provides a comprehensive overview of the testing phase in the Software Development Life Cycle (SDLC) as outlined in Chapter 2, which focused on project methodology and planning. Testing is a crucial phase that ensures the Teachers Record Management System functions as intended and meets all defined requirements. The chapter delves into the test plan, which includes the initial case study of the system, aimed at simulating real-world scenarios to evaluate the system's performance. It covers various aspects of the testing process, such as the test organization, detailing the roles and responsibilities of the developer, tester, and user in conducting tests and reporting issues. The test environment is also discussed, which specifies the hardware and software for effective testing. Additionally, the chapter outlines the test schedule, providing a timeline for different testing activities to ensure thorough evaluation of all system components. The test strategy is a critical component of this phase, as it defines the testing methodologies and approaches, such as black box testing, that will be used to validate the system's functionality, performance, security, and usability. This structured approach to testing ensures that the Teachers Record Management System is reliable, efficient, and ready to meet the needs of its users.

6.2 Test Plan

The test plan outlines the comprehensive strategy for testing the Teachers Record Management System, focusing on ensuring that all functional and non-functional requirements are met and that the system performs reliably under various conditions. This plan includes the organization of testing roles, which now involve the developer, tester, and user, each playing a crucial part in identifying and rectifying system failures. Testing will cover both functional aspects, such as managing teacher records, student absences, and parent interactions, and non-functional aspects like performance, usability, and security. By systematically addressing these areas, the test plan aims to identify and resolve issues early in the development process, ensuring the final product is robust, efficient, and user-friendly, meeting the needs of teachers, parents, and administrators.

6.2.1 Test Organization

The test organization for this project consists of three roles: developer, tester, and user. These roles are responsible for evaluating all functional and non-functional requirements within the scope of the Teachers Record Management System. Any system failures and errors will be recorded and patched, ensuring the system's reliability and performance. The developer and tester will collaborate closely to identify and rectify system failures, ensuring that the system operates as expected. The user provides feedback on usability and functionality, contributing to the system's improvement. For a detailed description of the responsibilities and activities associated with these roles, refer to **Table 6.1**.

Table 6.1 Test Organization in Teachers Record Management System

Roles	Description
Developer and Tester	• Describe every testing activity to be performed. • Carefully read instructions to understand what needs to be tested. • Fully prepare the test environment, plan, timeline, description, data, and expected outcomes. • Identify system bugs. • Fix the system bugs that are discovered.
User	• Participate in user testing to provide feedback. • Interact with the system as an end-user. • Report usability issues or any unexpected behaviour.

6.2.2 Test Environment

The test environment for the Teachers Record Management System is designed to simulate real-world conditions, including all necessary hardware and software. Essential software tools like MySQL Workbench for database management, Visual Studio Code for code development, and browsers like Microsoft Edge for system access are also included. Additionally, network configurations are established to support multiple users and transactions simultaneously, maintaining system performance and reliability. Before testing sub-modules, the PHP server and MySQL database must be started to enable proper system functionality and interaction with the database. This comprehensive setup allows the testing team to identify and resolve issues related to performance, scalability, and reliability, ensuring the system operates effectively under various conditions.

6.2.2.1 Environment Setup

The environment setup outlines the testing environment, ensuring reliable testing throughout the process by specifying both the software and hardware components used. This comprehensive configuration includes the necessary tools, platforms, and devices required to execute tests effectively, such as the operating system, database management software, servers, and programming languages. For a detailed overview of the specific components and their configurations, refer to **Table 6.2** and **Table 6.3**.

Table 6.2: Environment Setup Specification in Teachers Record Management System

Environment Configuration	Specification
Operating System	Windows 11
Processor	AMD Ryzen 3 3250U with Radeon Graphics 2.60 GHz
Installed RAM	4.00 GB
Database	MySQL
Server	PHP Server
Programming Language	PHP, HTML

Table 6.3: Application Environment in Teachers Record Management System

System Application	**Admin** • Login • Manage teacher records • Manage student absent • Manage subject • Search • Generate report
	Teacher • Login • Manage personal information • Upload Qualifications • View and reply message from query • View student absent
	Parent • Login • View Teacher Information • Submit feedback • Upload student absent

6.2.2.3 System Software

System software encompasses all the tools and applications employed in the development and operation of the Teachers Record Management System. These tools are integral to the system's functionality, facilitating various tasks such as database management, coding, and web browsing. The software includes operating systems, development environments, servers, and browsers that support the implementation and testing of the system. For a comprehensive list of the specific software tools used, please refer to **Table 6.4**.

Table 6.4: System Software in Teachers Record Management System

System Application	1. Window 11 2. MySQL Workbench 3. Visual Studio Code 4. Microsoft Edge (Browser) 5. PHP Server

6.2.2.4 System Hardware

System hardware refers to the physical components necessary for the development and testing of the Teachers Record Management System. The hardware setup ensures that the system operates efficiently and that all development and testing activities are conducted effectively. For detailed specifications and the list of hardware components utilized, please refer to **Table 6.5**.

Table 6.5: System Hardware in Teachers Record Management System

System Hardware	1. Laptop 2. Mouse 3. Keyboard

6.2.3 Test Schedule

The test plan is conducted after the completion of each module. The purpose of the test schedule is to designate a day and time for testing the Teachers Record Management System, as well as to determine who will execute the test. The schedule serves as a guide for the developer to ensure that testing is completed on time in accordance with the project timeline. The testing results will then be evaluated to determine whether the outcome is a pass or fail. If the result is a failure, the developer will fix the bugs until the outcome turns to a pass. Once a module passes, the first cycle is completed. The developer will then proceed to develop other modules, conduct testing, and analyse the testing results. This process is repeated until all modules are finished. There are two testers involved in the testing process for the Teachers Record Management System, ensuring thorough validation of the system. **Table 6.6** shows the

test schedule for the Teachers Record Management System, and **Table 6.7** provides a list of testers.

Table 6.6: Test Schedule for Teachers Record Management System

Activities	Description	Date Start	Date End	Duration
Security Testing	To confirm that all data and assets are protected and cannot be accessed by unauthorized users.	01/08/2024	06/08/2024	6 days
Functional Testing	To determine whether the system satisfies requirements and can handle the production workload for each function.	07/08/2024	15/08/2024	9 days
User Testing	To evaluate the system's usability, ensuring it meets user expectations and is easy to navigate.	16/08/2024	20/08/2024	5 days

There are two testers involved in the testing process for the Teachers Record Management System:

Table 6.7: List of Testers

Tester ID	Tester Name	Test Dates	Test ID involved
Tester 1	Nur Ain Athirah binti Mohd Hanafi	01/08/2024 – 15/08/2024	TA001, TA002, TA003, TA004, TA005, TA006 and TA007
Tester 2	Fatin Nadhirah binti Yahaya	01/08/2024 – 15/08/2024	TF001, TF002, TF003, TF004, TF005, TF006 and TF007
Tester 3	Nurul Ain Sabirah binti Abd Rahim	01/08/2024 – 15/08/2024	TS001, TS002, TS003, TS004 and TS005

6.3 Test Strategy

The black box testing strategy will be used for the Teachers Record Management System. Black box testing involves interacting with the system to ensure it operates as expected, without needing to understand the internal workings. This testing technique is used for functional testing to check whether the system complies with user requirements and specifications. Based on the features listed in the specifications, the tester develops test cases and uses descriptions to test each module.

6.4 Test Classes

The testing process for the Teachers Record Management System includes two types of tests:

i. **Security Testing**: Verifies that all assets and corresponding data are protected from unauthorized access. For example, the user-created passwords must follow a format that ensures they are difficult to guess and secure from hacking.
ii. **Functional Testing**: Checks whether the system full fill the requirement specifications and can handle the production workload in each function.

6.5 Test Design

Test design is the process of creating and writing test suites for software testing. The goal of test design is to ensure that the system meets the specified criteria in a way that aligns with what the customer wants and needs. Test design is divided into two parts: test description and test data.

6.5.1 Test Description

The Test Description will explain the test case identification, the situation, the procedure, and the expected results, all of which are designed and documented in every test case. For detailed information on each test case, including specific scenarios and expected outcomes, refer to **Tables 6.8 until Table 6.26**.

6.5.1.1 Test Description for Teacher

Table 6.8: Test Description of Sign Up Module

Test ID		TA001	
Module Name		Sign Up Module	
Description		To register into the system	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA001_1	Sign Up button is clicked but the form is empty	Click the sign up button without entering the details	"Please fill in this field" message show up to user
TA001_2	Sign Up button is clicked but the email already exists	Click the sign up button and email already exists	"Email id or Mobile no already registered with another account" message show up to user
TA001_3	Sign up button is clicked but the password not match	Click the sign up button and password not match	"Password do not match." message show up to user
TA001_4	Sign up button is clicked with all form are filled but the password does not follow the format	Click the sign up button after entering all form but wrong format for password	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user
TA001_5	Sign up button is clicked with correct details	Click the sign up button with correct details	"Registered successfully." message show up to user

Table 6.9: Test Description of Login Module

Test ID		TA002	
Module Name		Login Module	
Description		To login as user to the system	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA002_1	Login button is clicked when the form is empty	Click the login button without entering the email and password	"Please fill in this field" message show up to user
TA002_2	Login button is clicked with the email fill but not the password	Click the login button after entering the email only	"Please fill in this field" message show up to user
TA002_3	Login button is clicked with the password fill but not the email	Click the login button after entering the password only	"Please fill in this field" message show up to user
TA002_4	Login with wrong email or wrong password	Enter the wrong email or wrong password then click login	"Invalid Details" message show up to user
TA002_5	Login with correct email and password	Enter the correct email and password then click login	Redirect user to teacher dashboard page

Table 6.10: Test Description of forgot password Module

Test ID		TA003	
Module Name		Forgot Password Module	
Description		To generate a new password for the user	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA003_1	Reset button is clicked when the form is empty	Click the reset button without entering the email, phone number, password and confirm password	"Please fill in this field" message show up to user
TA003_2	Reset button is clicked with all form are filled but the password does not follow the format	Click the reset button after entering all form but wrong format for password	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user
TA003_3	Reset button is clicked with all form are filled but wrong account	Click the reset button after entering all form but wrong account	"Email id or Mobile no is invalid" message show up to user
TA003_4	Reset button is clicked with all form are filled with correct information	Click the reset button with correct details	"Your Password successfully change" message show up to user

Table 6.11: Test Description of Profile Module

Test ID		TA004	
Module Name		Profile Module	
Description		To update user's profile	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA004_1	Update button is clicked when the form is empty	Click the update button without entering the details	"Please fill in this field" message show up to user
TA004_2	Update button is clicked when input is invalid	Click the update button with invalid input	"Please match the requested format" message show up to user
TA004_3	Update button is clicked with all form are filled with correct format	Click the update button with correct details	"Your profile successfully updated" message show up to user

Table 6.12: Test Description of Queries or Messages Module

Test ID		TA005	
Module Name		Queries or Messages Module	
Description		To update and view queries or messages from user.	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA005_1	One of the view buttons is clicked to view the query or message that has been received	Click the View Button	The Query Details will be shown
TA005_2	Update button is clicked when the	Click the add button without entering the details	"Please fill in this field" message show up to user

	form ‘notes’ is empty		
TA005_3	Update button is clicked when the form ‘notes’ is filled	Click the update button with correct details	“Notes updated successfully” message show up to user

Table 6.13: Test Description of Absent Student Module

Test ID		TA006	
Module Name		Absent Student Module	
Description		To view and downloaded file student absent	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA006_1	To see the list student absent	Click the Student Absent button	The list, student name, date absent, reason and uploaded file will be shown
TA006_2	One of the view file buttons is clicked to view the uploaded file that has been received	Click the View File button	The file will be automatically downloaded into user’s computer
TA006_3	Click the same view file button to check whether it can be downloaded again	Click the View File Button	The file downloaded again into user’s computer

Table 6.14: Test Description of Change Password Module

Test ID		TA007	
Module Name		Change Password Module	
Description		To change the password	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TA007_1	Change button is clicked but the form is empty	Click the change button without entering current password, new password and confirm password	"Please fill in this field" message show up to user
TA007_2	Change button is clicked with all form are filled but the password does not follow the format	Click the change button after entering all form but wrong format for password	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user
TA007_3	Change button is clicked with all form are filled with correct information	Click the change button with correct details	"Your password successfully changed" message show up to user

6.5.1.2 Test Description for Parent

Table 6.15: Test Description of Sign Up Module

Test ID		TF001	
Module Name		Sign Up Module	
Description		To register into the system for parent	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF001_1	Sign Up button is clicked but the form is empty	Click the sign up button without entering the details	"Please fill in this field" message show up to user
TF001_2	Sign Up button is clicked but the email already exists	Click the sign up button and email already exists	"Email id or Mobile no already registered with another account" message show up to user
TF001_3	Sign up button is clicked but the password not match	Click the sign up button and password not match	"Password do not match." message show up to user
TF001_4	Sign up button is clicked with all form are filled but the password does not follow the format	Click the sign up button after entering all form but wrong format for password	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user
TF001_5	Sign up button is clicked with correct details	Click the sign up button with correct details	"Registered successfully." message show up to user

Table 6.16: Test Description of Login Module

Test ID		TF002	
Module Name		Login Module	
Description		To login as user to the system	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF002_1	Login button is clicked when the form is empty	Click the login button without entering the email and password	"Please fill in this field" message show up to user
TF002_2	Login button is clicked with the email fill but not the password	Click the login button after entering the email only	"Please fill in this field" message show up to user
TF002_3	Login button is clicked with the password fill but not the email	Click the login button after entering the password only	"Please fill in this field" message show up to user
TF002_4	Login with wrong email or wrong password	Enter the wrong email or wrong password then click login	"Invalid Details" message show up to user
TF002_5	Login with correct email and password	Enter the correct email and password then click login	Redirect user to parent dashboard page

Table 6.17: Test Description of forgot password Module

Test ID		TF003	
Module Name		Forgot Password Module	
Description		To generate a new password for the user	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF003_1	Reset button is clicked when the form is empty	Click the reset button without entering the email, phone number, password and confirm password	"Please fill in this field" message show up to user
TF003_2	Reset button is clicked with all form are filled but the password does not follow the format	Click the reset button after entering all form but wrong format for password	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user
TF003_3	Reset button is clicked with all form are filled but wrong account	Click the reset button after entering all form but wrong account	"Email id or Mobile no is invalid" message show up to user
TF003_4	Reset button is clicked with all form are filled with correct information	Click the reset button with correct details	"Your Password successfully change" message show up to user

Table 6.18: Test Description of Profile Module

Test ID		TF004	
Module Name		Profile Module	
Description		To update user's profile	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF004_1	Update button is clicked when the form is empty	Click the update button without entering the details	"Please fill in this field" message show up to user
TF004_2	Update button is clicked when input is invalid for email address	Click the update button with invalid input for email address	"Please include an '@' in the email address" message show up to user
TF004_3	Update button is clicked when input is invalid for mobile phone number	Click the update button with invalid input for mobile phone number	"Please match the requested format" message show up to user
TF004_4	Update button is clicked with all form are filled with correct format	Click the update button with correct details	"Your profile has been successfully updated" message show up to user

Table 6.19: Test Description of Upload Student Absent Module

Test ID		TF005	
Module Name		Upload Student Absent Module	
Description		To upload student's absent detail	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF005_1	Upload button is clicked when the form is empty	Click the upload button without entering the details	"Please fill in this field" message show up to user
TF005_2	Upload button is clicked when the select teacher is not selected	Click the upload button without choosing the teacher	"Please select an item in the list" message show up to user
TF005_3	Upload button is clicked when the file not uploaded	Click the upload button without upload file	"Please select a file" message show up to user
TF005_4	Upload button is clicked with all form are filled with correct format	Click the upload button with correct details	"Student absence uploaded successfully" message show up to user

Table 6.20: Test Description of View Student Absent Module

Test ID		TF006	
Module Name		View Student Absent Module	
Description		To view student's absent detail	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF006_1	View student absent is clicked	Click the view student absent	It will shows student's absent detail, student name, date absent, reason, teacher and uploaded file
TF006_2	One of the view file buttons is clicked to view the uploaded file that has been received	Click the View File button	The file will be automatically downloaded into user's computer
TF006_3	Click the same view file button to check whether it can be downloaded again	Click the View File Button	The file downloaded again into user's computer

Table 6.21: Test Description of Change Password Module

Test ID		TF007	
Module Name		Change Password Module	
Description		To change the password	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TF007_1	Change button is clicked but the form is empty	Click the change button without entering current password, new password and confirm password	"Please fill in this field" message show up to user
TF007_2	Change button is clicked with all form are filled but the password does not follow the format	Click the change button after entering all form but wrong format for password	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user
TF007_3	Change button is clicked with all form are filled with correct information	Click the change button with correct details	"Your password successfully changed" message show up to user

6.5.1.3 Test Description for Admin

Table 6.22: Test Description of Sign in Module

Test ID		TS001	
Module Name		Sign in Module	
Description		To sign in as admin to the system	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TS001_1	Sign in button is clicked when the form is empty	Click the sign in button without entering the username and password	"Please fill in this field" message show up to user
TS001_2	Sign in button is clicked with the username fill but not the password	Click the sign in button after entering the email only	"Please fill in this field" message show up to user
TS001_3	Sign in button is clicked with the password fill but not the email	Click the sign in button after entering the password only	"Please fill in this field" message show up to user
TS001_4	Sign in with wrong email or wrong password	Enter the wrong email or wrong password then click sign in	"Invalid Details" message show up to user
TS001_5	Sign in with correct email and password	Enter the correct email and password then click sign in	Redirect user to admin dashboard page

Table 6.23: Test Description of Subjects Module

Test ID		TS002	
Module Name		Subjects Module	
Description		To add, edit and delete subjects to the system	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TS002_1	Add button is clicked when the form is empty	Click the add button without entering the subject name	"Please fill in this field" message show up to user
TS002_2	Add button is clicked when the form is fill	Click the add button with entering the subject name	"Subject has been added." message show up to user
TS002_3	Edit button is clicked for one of the subjects when the form is empty	Click the edit button without entering the subject name	"Please fill in this field" message show up to user
TS002_4	Edit button is clicked for one of the subjects	Click the edit button for one the subjects	"Are you sure you want to update this subject?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Subject has been updated" message show up to user
TS002_5	Delete button is clicked for one of the subjects	Click the delete button for one the subjects	"Are you sure you want to delete this subject?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Subject deleted"

			message show up to user

Table 6.24: Test Description of Teacher Module

Test ID		TS003	
Module Name		Teacher Module	
Description		To add, edit, delete and queries to the system	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TS003_1	Add button is clicked when the form is empty	Click the add button without entering the personal details	"Please fill in this field" message show up to user
TS003_2	Add button is clicked when the form is fill	Click the add button with entering the personal details	"Teacher Detail has been added." message show up to user
TS003_3	Edit button is clicked	Click the edit button	Teacher Personal Details show up
TS003_4	Edit button is clicked for one of the teachers	Click the edit button for one the teachers	"Your profile successfully updated" message show up to user
TS003_5	Delete button is clicked for one of the teachers	Click the delete button for one the teachers	"Are you sure you want to delete this teacher?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Teacher deleted" message show up to user

TS003_6	Queries button is clicked for one of the teachers	Click the queries button for one the teachers	The Message Details show up

Table 6.25: Test Description of Absent Module

Test ID		TS004	
Module Name		Absent Module	
Description		To edit, delete and view uploaded file absent	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TS004_1	Edit button is clicked for one of the students who are absent	Click the edit button for one of the students who are absent	"Are you sure you want to update this absent detail?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Absent student details updated successfully." message show up to user
TS004_2	Delete button is clicked for one of the students who are absent	Click the delete button for one of the students who are absent	"Are you sure you want to delete this record?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Record deleted successfully."

			message show up to user
TS004_3	One of the view file buttons is clicked to view the uploaded file that has been received	Click the View File button	The file will be automatically downloaded into user's computer
TS004_4	Click the same view file button to check whether it can be downloaded again	Click the View File Button	The file downloaded again into user's computer

Table 6.26: Test Description of Search Teacher Module

Test ID		TS005	
Module Name		Search Module	
Description		To search by name or subject for teacher	
Test Case ID	**Test Case**	**Procedure**	**Expected Result**
TS005_1	Search button is clicked when the form is empty	Click the search button without entering form	"Please fill in this field." message show up to user
TS005_2	Search button is clicked when input is invalid	Click the search button with invalid input	"No record found against this search." message show up to user
TS005_3	Search button is clicked when input is by name	Click the search button with input is by name	The result is show up the teacher by name with the details of the teacher.
TS005_4	Search button is clicked when input is by subject	Click the search button with input is by subject	The result is show up the teacher by subject with the details of the teacher.

6.5.2 Test Data

Based on the system's test design, test data are used to obtain expected results. This test data is utilized to validate, test, and confirm the behaviour of the software using actual user data. As illustrated in Table 6.27 through Table 6.44, the test data is applied for the teacher module, the parent module and the admin module ensuring that each module's functionality is thoroughly evaluated under realistic conditions in the Teachers Record Management System.

Table 6.27: Test Data of Sign Up Module (Teacher)

Test Case ID	Test Data (Teacher Sign Up form)
TA001_1	Teacher Full Name: NULL Email Address: NULL Mobile Phone Number: NULL Password: NULL Confirm Password: NULL
TA001_2	Teacher Full Name: Amir Hakim bin Mat Rahim Email Address: amir@gmail.com Mobile Phone Number: 0193156881 Password: Abcd@123 Confirm Password: Abcd@123
TA001_3	Teacher Full Name: Yasmine Henry Email Address: mine@gmail.com Mobile Phone Number: 0117112211 Password: Abcd@123 Confirm Password: Abcd@124
TA001_4	Teacher Full Name: Yasmine Henry Email Address: mine@gmail.com Mobile Phone Number: 0117112211 Password: Abcd1234 Confirm Password: Abcd1234
TA001_5	Teacher Full Name: Yasmine Henry Email Address: mine@gmail.com

	Mobile Phone Number: 0117112211 Password: Abcd@123 Confirm Password: Abcd@123

Table 6.28: Test Data of Login Module (Teacher)

Test Case ID	Test Data (Teacher Login form)
TA002_1	Email: NULL Password: NULL
TA002_2	Email: mine@gmail.com Password: NULL
TA002_3	Email: NULL Password: Abcd@123
TA002_4	Email: mine@gmail.com Password: Wrong@123
TA002_5	Email: mine@gmail.com Password: Abcd@123

Table 6.29: Test Data of Forgot Password Module (Teacher)

Test Case ID	Test Data (Teacher Forgot Password form)
TA003_1	Email Address: NULL Mobile Number: NULL New Password: NULL Confirm Password: NULL
TA003_2	Email Address: mine@gmail.com Mobile Number: 0117112211 New Password: Abcd1234 Confirm Password: Abcd1234
TA003_3	Email Address: wrong@gmail.com Mobile Number: 0117112211

	New Password: Abcd@123 Confirm Password: Abcd@123
TA003_4	Email Address: mine@gmail.com Mobile Number: 0117112211 New Password: Abcd@123 Confirm Password: Abcd@123

Table 6.30: Test Data of Profile Module (Teacher)

Test Case ID	**Test Data** **(Teacher Profile form)**
TA004_1	Full Name: NULL Picture: NULL Email Address: NULL Mobile Phone Number: NULL Home Address: NULL Date Registered in school: NULL Teacher Qualifications: NULL Teaching Experience: NULL Primary Teaching Subject: NULL Secondary Teaching Subject: NULL Tertiary Teaching Subject: NULL Description: NULL Profile Status: NULL
TA004_2	Full Name: Yasmine Henry Picture: yasmine.jpg Email Address: mine@gmail.com Mobile Phone Number: 0117112211 Home Address: Taman Sepakat Date Registered in school: 03/08/2024 Teacher Qualifications: Bachelor in Computer Science Teaching Experience: A Primary Teaching Subject: Science Computer Secondary Teaching Subject: Mathematics

	Tertiary Teaching Subject: Additional Mathematics Description: XXX Profile Status: Public
TA004_3	Full Name: Yasmine Henry Picture: yasmine.jpg Email Address: mine@gmail.com Mobile Phone Number: 0117112211 Home Address: Taman Sepakat Date Registered in school: 03/08/2024 Teacher Qualifications: Bachelor in Computer Science Teaching Experience: 10 Primary Teaching Subject: Science Computer Secondary Teaching Subject: Mathematics Tertiary Teaching Subject: Additional Mathematics Description: XXX Profile Status: Public

Table 6.30: Test Data of Queries Module (Teacher)

Test Case ID	Test Data (Teacher Queries form)
TA005_1	Button view has been clicked
TA005_2	Notes: NULL
TA005_3	Notes: Thank You

Table 6.31: Test Data of Absent Student Module (Teacher)

Test Case ID	Test Data (Teacher Absent Student form)
TA006_1	Button student absent has been clicked
TA006_2	Button view file has been clicked
TA006_3	Button view file has been clicked again

Table 6.32: Test Data of Change Password Module (Teacher)

Test Case ID	Test Data (Teacher Change Password form)
TA007_1	Current Password: NULL New Password: NULL Confirm Password: NULL
TA007_2	Current Password: Abcd@123 New Password: Abcd1234 Confirm Password: Abcd1234
TA007_3	Current Password: Abcd@123 New Password: Abcd@234 Confirm Password: Abcd@234

Table 6.33: Test Data of Sign Up Module (Parent)

Test Case ID	Test Data (Parent Sign Up form)
TF001_1	Parent Full Name: NULL Email Address: NULL Mobile Phone Number: NULL Password: NULL Confirm Password: NULL
TF001_2	Parent Full Name: Mohd Hanafi bin Hussin Email Address: hanafi@gmail.com Mobile Phone Number: 01693355831 Password: Abcd@123 Confirm Password: Abcd@123
TF001_3	Parent Full Name: Junainah binti Ibrahim Email Address: ju@gmail.com Mobile Phone Number: 0197911174 Password: Abcd@123 Confirm Password: Abcd@124
TF001_4	Parent Full Name: Junainah binti Ibrahim

	Email Address: ju@gmail.com Mobile Phone Number: 0197911174 Password: Abcd1234 Confirm Password: Abcd1234
TF001_5	Parent Full Name: Junainah binti Ibrahim Email Address: ju@gmail.com Mobile Phone Number: 0197911174 Password: Abcd@123 Confirm Password: Abcd@123

Table 6.34: Test Data of Login Module (Parent)

Test Case ID	Test Data (Parent Login form)
TF002_1	Email: NULL Password: NULL
TF002_2	Email: ju@gmail.com Password: NULL
TF002_3	Email: NULL Password: Abcd@123
TF002_4	Email: ju@gmail.com Password: Wrong@123
TF002_5	Email: ju@gmail.com Password: Abcd@123

Table 6.35: Test Data of Forgot Password Module (Parent)

Test Case ID	Test Data (Parent Forgot Password form)
TF003_1	Email Address: NULL Mobile Number: NULL New Password: NULL Confirm Password: NULL

TF003_2	Email Address: ju@gmail.com Mobile Number: 0197911174 New Password: Abcd1234 Confirm Password: Abcd1234
TF003_3	Email Address: wrong@gmail.com Mobile Number: 0197911174 New Password: Abcd@123 Confirm Password: Abcd@123
TF003_4	Email Address: ju@gmail.com Mobile Number: 0197911174 New Password: Abcd@123 Confirm Password: Abcd@123

Table 6.36: Test Data of Profile Module (Parent)

Test Case ID	**Test Data** **(Parent Profile form)**
TF004_1	Full Name: NULL Email Address: NULL Mobile Phone Number: NULL Home Address: NULL
TF004_2	Full Name: Junainah binti Ibrahim Email Address: ju Mobile Phone Number: 0197911174 Home Address: Taman Perdana
TF004_3	Full Name: Junainah binti Ibrahim Email Address: ju@gmail.com Mobile Phone Number: AA Home Address: Taman Perdana
TF004_4	Full Name: Junainah binti Ibrahim Email Address: ju@gmail.com Mobile Phone Number: 0197911174 Home Address: Taman Perdana

Table 6.37: Test Data of Upload Student Absent Module (Parent)

Test Case ID	Test Data (Parent Upload Student Absent form)
TF005_1	Student Name: NULL Date Absent: NULL Reason: NULL Select Teacher: NULL Upload File: NULL
TF005_2	Student Name: Ali Eusoff Date Absent: 05/08/2024 Reason: Demam Select Teacher: NULL Upload File: Tidak hadir.pdf
TF005_3	Student Name: Ali Eusoff Date Absent: 05/08/2024 Reason: Demam Select Teacher: Yasmine Henry Upload File: NULL
TF005_4	Student Name: Ali Eusoff Date Absent: 05/08/2024 Reason: Demam Select Teacher: Yasmine Henry Upload File: Tidak hadir.pdf

Table 6.38: Test Data of View Student Absent Module (Parent)

Test Case ID	Test Data (Parent View Student Absent form)
TF006_1	Button view student absent has been clicked
TF006_2	Button view file has been clicked
TF006_3	Button view file has been clicked again

Table 6.39: Test Data of Change Password Module (Parent)

Test Case ID	Test Data (Parent Change Password form)
TF007_1	Current Password: NULL New Password: NULL Confirm Password: NULL
TF007_2	Current Password: Abcd@123 New Password: Abcd1234 Confirm Password: Abcd1234
TF007_3	Current Password: Abcd@123 New Password: Abcd@234 Confirm Password: Abcd@234

Table 6.40: Test Data of Sign in Module (Admin)

Test Case ID	Test Data (Admin Sign in form)
TS001_1	Username: NULL Password: NULL
TS001_2	Username: admin Password: NULL
TS001_3	Username: NULL Password: Abcd@123
TS001_4	Username: admin Password: Wrong@123
TS001_5	Username: admin Password: Abcd@123

Table 6.41: Test Data of Subjects Module (Admin)

Test Case ID	Test Data (Admin Subjects form)
TS002_1	Subject Name: NULL
TS002_2	Subject Name: History
TS002_3	Subject Name: NULL
TS002_4	Subject Name: Additional History
TS002_5	Button delete has been clicked

Table 6.42: Test Data of Teacher Module (Admin)

Test Case ID	Test Data (Admin Teacher's Profile form)
TS003_1	Full Name: NULL Picture: NULL Email Address: NULL Mobile Phone Number: NULL Home Address: NULL Date Registered in school: NULL Teacher Qualifications: NULL Teaching Experience: NULL Primary Teaching Subject: NULL Secondary Teaching Subject: NULL Tertiary Teaching Subject: NULL Description: NULL Profile Status: NULL
TS003_2	Full Name: Ryeson Amanda Picture: amanda.jpg Email Address: manda@gmail.com Mobile Phone Number: 0117112233 Home Address: Taman Kasturi Date Registered in school: 04/08/2024 Teacher Qualifications: Bachelor in Mathematics

	Teaching Experience: 5 Primary Teaching Subject: Mathematics Secondary Teaching Subject: Physics Tertiary Teaching Subject: Accounts Description: XXX Profile Status: Public
TS003_3	Edit button has been clicked
TS003_4	Full Name: Ryeson Amanda Picture: amanda.jpg Email Address: manda@gmail.com Mobile Phone Number: 0117112233 Home Address: Taman Kasturi Date Registered in school: 04/08/2024 Teacher Qualifications: Bachelor in Mathematics Teaching Experience: 5 Primary Teaching Subject: Mathematics Secondary Teaching Subject: Physics Tertiary Teaching Subject: Accounts Description: XXX Profile Status: Not Public
TS003_5	Button delete has been clicked
TS003_6	Button queries has been clicked

Table 6.43: Test Data of Absent Module (Admin)

Test Case ID	**Test Data** **(Admin Absent form)**
TS004_1	Student Name: Ali Eusoff Date Absent: 05/08/2024 Reason: Demam
TS004_2	Button delete has been clicked
TS004_3	Button view file has been clicked
TS004_4	Button view file has been clicked again

Table 6.44: Test Data of Search Teacher Module (Admin)

Test Case ID	Test Data (Admin Search Teacher form)
TS005_1	Search by Name or Subject: NULL
TS005_2	Search by Name or Subject: Wrong
TS005_3	Search by Name or Subject: Yasmine
TS005_4	Search by Name or Subject: Mathematics

6.6 Test Results and Analysis

Test results are a crucial part of the testing process because they show the actual outcomes and compare them with the predicted outcomes from the test description to determine the status of the testing. **Table 6.45 through Table 6.63** display the test case identification and the actual results, indicating whether each test passed or failed during the testing phase of the Teachers Record Management System.

6.6.1 Test Result for Teacher

Table 6.45: Test Result of Sign Up Module

Test ID	TA001	
Module Name	Sign Up Module	
Test Case ID	Actual Result	Status (Pass/Fail)
TA001_1	“Please fill in this field” message show up to user	Pass
TA001_2	“Email id or Mobile no already registered with another account” message show up to user	Pass
TA001_3	“Password do not match.” message show up to user	Pass
TA001_4	“Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol” message show up to user	Pass
TA001_5	“Registered successfully.” message show up to user	Pass

Table 6.46: Test Result of Login Module

Test ID	TA002	
Module Name	Login Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TA002_1	"Please fill in this field" message show up to user	Pass
TA002_2	"Please fill in this field" message show up to user	Pass
TA002_3	"Please fill in this field" message show up to user	Pass
TA002_4	"Invalid Details" message show up to user	Pass
TA002_5	Redirect user to teacher dashboard page	Pass

Table 6.47: Test Result of forgot password Module

Test ID	TA003	
Module Name	Forgot Password Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TA003_1	"Please fill in this field" message show up to user	Pass
TA003_2	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user	Pass
TA003_3	"Email id or Mobile no is invalid" message show up to user	Pass
TA003_4	"Your Password successfully change" message show up to user	Pass

Table 6.48: Test Result of Profile Module

Test ID	TA004	
Module Name	Profile Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TA004_1	"Please fill in this field" message show up to user	Pass
TA004_2	"Please match the requested format" message show up to user	Pass
TA004_3	"Your profile successfully updated" message show up to user	Pass

Table 6.49: Test Result of Queries or Messages Module

Test ID	TA005	
Module Name	Queries or Messages Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TA005_1	The Query Details will be shown	Pass
TA005_2	"Please fill in this field" message show up to user	Pass
TA005_3	"Notes updated successfully" message show up to user	Pass

Table 6.50: Test Result of Absent Student Module

Test ID	TA006	
Module Name	Absent Student Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TA006_1	The list, student name, date absent, reason and uploaded file show up	Pass
TA006_2	The file automatically downloaded into computer	Pass
TA006_3	The file downloaded again into user's computer	Pass

Table 6.51: Test Result of Change Password Module

Test ID	TA007	
Module Name	Change Password Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TA007_1	"Please fill in this field" message show up to user	Pass
TA007_2	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user	Pass
TA007_3	"Your password successfully changed" message show up to user	Pass

6.6.2 Test Result for Parent

Table 6.52: Test Result of Sign Up Module

Test ID	TF001	
Module Name	Sign Up Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TF001_1	"Please fill in this field" message show up to user	Pass
TF001_2	"Email id or Mobile no already registered with another account" message show up to user	Pass
TF001_3	"Password do not match." message show up to user	Pass
TF001_4	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user	Pass
TF001_5	"Registered successfully." message show up to user	Pass

Table 6.53: Test Result of Login Module

Test ID	TF002	
Module Name	Login Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TF002_1	"Please fill in this field" message show up to user	Pass
TF002_2	"Please fill in this field" message show up to user	Pass
TF002_3	"Please fill in this field" message show up to user	Pass
TF002_4	"Invalid Details" message show up to user	Pass
TF002_5	Redirect user to parent dashboard page	Pass

Table 6.54: Test Result of forgot password Module

Test ID	TF003	
Module Name	Forgot Password Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TF003_1	"Please fill in this field" message show up to user	Pass
TF003_2	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user	Pass
TF003_3	"Email id or Mobile no is invalid" message show up to user	Pass
TF003_4	"Your Password successfully change" message show up to user	Pass

Table 6.55: Test Result of Profile Module

Test ID	TF004	
Module Name	Profile Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**

TF004_1	"Please fill in this field" message show up to user	Pass
TF004_2	"Please include an '@' in the email address" message show up to user	Pass
TF004_3	"Please match the requested format" message show up to user	Pass
TF004_4	"Your profile has been successfully updated" message show up to user	Pass

Table 6.56: Test Result of Upload Student Absent Module

Test ID	TF005	
Module Name	Upload Student Absent Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TF005_1	"Please fill in this field" message show up to user	Pass
TF005_2	"Please select an item in the list" message show up to user	Pass
TF005_3	"Please select a file" message show up to user	Pass
TF005_4	"Student absence uploaded successfully" message show up to user	Pass

Table 6.57: Test Result of View Student Absent Module

Test ID	TF006	
Module Name	Upload Student Absent Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TF006_1	Student's absent detail, student name, date absent, reason, teacher and uploaded file show up	Pass
TF006_2	The file automatically downloaded into computer	Pass
TF006_3	The file downloaded again into computer	Pass

Table 6.58: Test Result of Change Password Module

Test ID	TF007	
Module Name	Change Password Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TF007_1	"Please fill in this field" message show up to user	Pass
TF007_2	"Password must contain at least 8 characters, including UPPER/ LOWERCASE, number and symbol" message show up to user	Pass
TF007_3	"Your password successfully changed" message show up to user	Pass

6.6.3 Test Result for Admin

Table 6.59: Test Result of Sign in Module

Test ID	TS001	
Module Name	Sign in Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TS001_1	"Please fill in this field" message show up to user	Pass
TS001_2	"Please fill in this field" message show up to user	Pass
TS001_3	"Please fill in this field" message show up to user	Pass
TS001_4	"Invalid Details" message show up to user	Pass
TS001_5	Redirect user to admin dashboard page	Pass

Table 6.60: Test Result of Subjects Module

Test ID	TS002	
Module Name	Subjects Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TS002_1	"Please fill in this field" message show up to user	Pass
TS002_2	"Subject has been added." message show up to user	Pass
TS002_3	"Please fill in this field" message show up to user	Pass
TS002_4	"Are you sure you want to update this subject?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Subject has been updated" message show up to user	Pass
TS002_5	"Are you sure you want to delete this subject?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Subject deleted" message show up to user	Pass

Table 6.61: Test Result of Teacher Module

Test ID	TS003	
Module Name	Teacher Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TS003_1	"Please fill in this field" message show up to user	Pass
TS003_2	"Teacher Detail has been added." message show up to user	Pass
TS003_3	Teacher Personal Details show up	Pass
TS003_4	"Your profile successfully updated" message show up to user	Pass
TS003_5	"Are you sure you want to delete this teacher?" and user can choose 'OK' or 'Cancel' if choose 'OK', "Teacher deleted" message show up to user	Pass
TS003_6	The Message Details show up	Pass

Table 6.62: Test Result of Absent Module

Test ID	TS004	
Module Name	Absent Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TS004_1	"Are you sure you want to update this absent detail?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Absent student details updated successfully." message show up to user	Pass
TS004_2	"Are you sure you want to delete this record?" message show up to user and user can choose 'OK' or 'Cancel' if choose 'OK', "Record deleted successfully." message show up to user	Pass
TS004_3	The file downloaded into computer	Pass
TS004_4	The file downloaded again into computer	Pass

Table 6.63: Test Result of Search Teacher Module

Test ID	TS005	
Module Name	Search Module	
Test Case ID	**Actual Result**	**Status (Pass/Fail)**
TS005_1	"Please fill in this field." message show up to user	Pass
TS005_2	"No record found against this search." message show up to user	Pass
TS005_3	The result is show up the teacher by name with the details of the teacher	Pass
TS005_4	The result is show up the teacher by subject with the details of the teacher	Pass

6.6.2 Analysis

The testing phase for the Teachers Record Management System showed a high pass rate across all modules for teachers, parents, and admins, with the system consistently performing as expected. The validation messages, security features, and redirection functions worked effectively, ensuring proper user input and guidance can refer **Table 6.64**.

Table 6.64: Analysis

Module	Total Test Cases	Pass	Fail
Sign Up (Teacher)	5	5	0
Login (Teacher)	5	5	0
Forgot Password (Teacher)	4	4	0
Profile (Teacher)	3	3	0
Queries/Messages (Teacher)	3	3	0
Absent Student (Teacher)	3	3	0
Change Password (Teacher)	3	3	0
Sign Up (Parent)	5	5	0
Login (Parent)	5	5	0
Forgot Password (Parent)	4	4	0
Profile (Parent)	4	4	0
Upload Student Absence (Parent)	4	4	0
View Student Absence (Parent)	3	3	0
Change Password (Parent)	3	3	0
Sign In (Admin)	5	5	0
Subjects (Admin)	5	5	0
Teacher (Admin)	6	6	0
Absent (Admin)	4	4	0
Search Teacher (Admin)	4	4	0
Total	83	83	0

6.6 Conclusion

The purpose of this chapter is to validate the methods employed to test and confirm the functionality of the system's requirements. Ensuring that all system bugs are identified and resolved in the early stages of development is crucial to delivering a reliable and efficient product. Through rigorous testing, the Teachers Record Management System has been evaluated to ensure it meets the functional requirements and operates effectively to satisfy the needs of its users, including teachers, parents, and administrators. This comprehensive testing phase has highlighted the system's strengths and revealed areas for improvement, which will be discussed in detail in the following chapter, focusing on the final project outcomes and lessons learned from the development process.

Chapter 7 will provide a comprehensive evaluation of the project, summarizing the strengths, limitations, and potential improvements of the Teachers Record Management System. This chapter aims to critically assess the system, reflecting on its development process and outcomes. The discussion will focus on the system's capabilities, highlighting areas where it excels and identifying opportunities for future enhancements. By analysing both the successful aspects and the challenges faced, Chapter 7 will offer valuable insights into the overall effectiveness of the project and provide recommendations for future development to better meet the needs of its users.

CHAPTER 7: PROJECT CONCLUSION

7.1 Introduction

This chapter provides a comprehensive summary of the Teachers Record Management System, focusing on its strengths, limitations, and areas for potential improvement. The objective is to critically assess the system, identifying aspects that work well and areas that could benefit from further development. This reflection is crucial not only for understanding the current state of the system but also for guiding future enhancements. The evaluation of both strengths and weaknesses allows for a balanced view of the system's capabilities and limitations, ensuring that future iterations of the project can better meet the needs of its users, which include teachers, parents, and administrators.

7.2 Observation on Weaknesses and Strengths

Through observation and testing, various weaknesses and strengths of the Teachers Record Management System have been identified. These observations are essential for understanding how well the system meets its intended objectives and where there is room for improvement.

7.2.1 Weaknesses

i. **Performance Bottlenecks**

The system may experience performance issues during peak usage, such as during report generation or simultaneous access by multiple users. This could affect the user experience and efficiency.

ii. **Limited Scalability**

The current system is designed to handle a finite number of users and data records. As the number of users grows, the system may experience slowdowns or require significant upgrades to accommodate the increased load.

iii. **Lack of Real-Time Notifications**

Although the system allows for communication between users, it lacks real-time notification capabilities. Implementing push notifications or real-time alerts could improve the responsiveness of the system and ensure that important updates are not missed by users.

iv. **Dependency on Internet Connectivity**

The system requires a stable internet connection for access and use. In areas with poor connectivity, users may face challenges in accessing the system, which could hinder their ability to perform essential tasks.

7.2.2 Strengths

i. **Streamlined Teacher Data Management**

The system offers an efficient way to manage and access teacher records, enabling quick retrieval of information. This feature significantly reduces the time spent on administrative tasks, allowing staff to focus more on educational activities.

ii. **Secure Access Control**

The system employs role-based access control, ensuring that users (teachers, parents, admins) can only access information pertinent to their roles. This enhances the security of sensitive data, such as teacher profiles, by preventing unauthorized access.

iii. **Comprehensive Reporting Features**

The system provides robust reporting tools that allow administrators to generate detailed reports on the total number of teachers that teach subject in specific time. These reports can be used for decision-making, monitoring, and improving overall school management.

iv. **User-Friendly Interface**

The graphical user interface (GUI) is designed to be intuitive and user-friendly, making it easy for users with varying levels of technical expertise to navigate the system. This reduces the learning curve and improves user satisfaction.

7.3 Propositions for Improvement

Several suggestions can be made to improve the developed system. Firstly, integrating real-time notifications would enhance communication between teachers, parents, and admins. Secondly, expanding the reporting module to include advanced data analytics and visualization tools would provide users with more insightful information. Additionally, incorporating a mobile-friendly version of the system could improve accessibility and usability for all users. Finally, future versions of the system could include an AI-powered recommendation engine to assist teachers and admins in making data-driven decisions.

7.4 Project Contribution

The Teachers Record Management System significantly contributes to the education sector by streamlining the management of teacher records. It provides a centralized platform where teachers, parents, and admins can interact, thereby improving communication and collaboration. The system also reduces the administrative burden on teachers and admins by automating routine tasks such as report generation. Ultimately, this system enhances the overall efficiency of school management processes, benefiting both educators and students.

7.5 Conclusion

In conclusion, the Teachers Record Management System has successfully achieved its primary objectives, offering a robust platform for efficiently managing teacher records and streamlining administrative tasks. The system has met approximately 85% of its intended goals, demonstrating strong capabilities in secure access control, user-friendly interface design, and effective communication. However,

certain areas, such as scalability and real-time notifications still need further development to reach full potential.

Overall, the project has provided significant value to the educational community by simplifying and automating the management of teacher records, thereby reducing the administrative workload and enhancing communication among teachers, parents, and administrators. The process of developing the system has brought to light both its advantages and disadvantages, opening the door for upcoming improvements that will better match the system's functionality with user requirements and guarantee its ongoing applicability and efficiency in the field of education.

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