Quiz Master

BS Computer Science

Session 2019-2023

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Final Approval

This is to certify that we have studied this thesis, titled **"Quiz Master"** submitted by **Syed Hasnain Shah and Hazrat Bilal** under the university registration number **UOS196021007** and **UOS196021032** respectively. We conclude that this project report is of sufficient standard to warrant its acceptance by the University of Swat for the award of the degree of Bachelors of Sciences in Computer Science.

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Dedication

We dedicate our work to our family, friends and teachers. The unrivalled encouragement from our parents and outstanding support from teachers is what lead to success of this project. I also dedicate this work to all those who love learning and making the world a better place. May this project make a positive difference in our lives. We also dedicate our work to our supervisor Dr. Amjad Ali.

Acknowledgement

I am sincerely thankful to Almighty Allah for granting me the strength and knowledge to complete this task. My deepest gratitude goes to my parents, who supported me both financially and emotionally throughout my BS (CS) degree. I am truly appreciative of the guidance provided by Dr. AMJAD ALI, whose valuable support ensured the smooth completion of this project.

I am profoundly indebted to my mother, father, and brothers for their unwavering encouragement and moral support. I am also grateful to everyone who supported and encouraged me in various ways. Without their love, patience, and assistance, this achievement would not have been possible.

Syed Hasnain Shah

Hazrat Bilal

Abstract

The Online Multiple-Choice Questions (MCQs) Test System is a web-based platform designed to streamline and enhance the assessment and evaluation process in educational and professional settings. This system leverages technology to create a user-friendly and efficient environment for both test administrators and test-takers. The system offers an intuitive and user-friendly interface, making it accessible to users of all technical backgrounds. Test-takers can easily navigate through the platform. Administrators can effortlessly create, edit, and manage tests with a wide range of options for customization. These tests can cover diverse subjects and topics. The system includes a comprehensive MCQ question library, reducing the time and effort required to create new tests. Questions can be categorized and tagged for easy retrieval. Test questions and answer choices can be randomized to reduce the risk of cheating and enhance the integrity of assessments. Administrators can set time limits for tests, helping to simulate real-world time constraints, particularly for competitive and certification exams. Test-takers receive immediate feedback upon test completion, including a detailed score breakdown and explanations for incorrect answers. The system is designed to be accessible to users with disabilities, ensuring inclusivity in assessment. Robust security measures are implemented to safeguard the integrity and privacy of test content and results. Administrators can generate detailed reports and analytics on test performance, helping to identify areas of improvement and assess the effectiveness of instructional material. The system can be integrated with remote proctoring solutions, ensuring test integrity in remote and online environments.

Forwarding Sheet

The thesis titled **"Quiz Master"** submitted by **Syed Hasnain Shah** and **Hazrat Bilal** in partial fulfillment of BS degree in Computer Science has been completed under my guidance and supervision. I am satisfied with the quality of their project work.

Dr. Amjad Ali

Declaration

We affirm that the document titled "Quiz Master," whether in its entirety or in parts, has not been plagiarized from any source. We assert that this project and its accompanying report were completed solely through our personal efforts. We received valuable guidance from our teachers, particularly our supervisor Dr. Amjad Ali. We are fully responsible for our work. If any portion of the system is found to be copied or reproduced from another source, we accept the consequences of our actions.

Syed Hasnain Shah

Hazrat Bilal

Chapter 1
INTRODUCTION

The Quiz Master is designed to provide a systematic examination system for an institution to manage the records of students regarding registration, score, and approval. It makes managing exams and student data easier for institutes. With Quiz Master, schools can easily organize exams and access student records in a simple and consistent manner. This system simplifies the examination process, making it accessible and straightforward for everyone involved.

The project titled 'Quiz Master' is online testing application for controlling and monitoring the test of new comers of an institute. Quiz Master is an application that will work on any updated browser, designed to help users to maintain and organize their data. This is a responsive web application that will fit any device screen and the interface will change according to the device being used.

This Web Application (Quiz Master) has three main modules.

- Insertion to database
- Extracting from database
- Search facility system

Quiz Master provides a standard GUI (graphical user interface) for the teachers, admins and students to manage the functions of the institution effectively.

1.1 Problems

In essence, a problem statement in a system typically consists of two components: a clear and detailed description of the problem along with contextual information to explain its importance, and the proposed methods for solving the problem, often presented as a claim or working thesis.

1.1.1 Problem Analysis

- Anybody should not be able to register and appear in exam which is not being registered by Teachers.
- Nobody should be able to attempt exam again and again.

- Nobody should be able to attempt previous exam once logout
- Searching for records can become challenging, especially when dealing with a large volume of data.
- How to select specific number of questions when there are several teachers of several subjects with several questions.

1.1.2 Proposed Solution

- The student will be register with his full original data by teachers. Hence the teacher and admin will check the record of registered students manually then he will approve and the student can appear in test, otherwise not.
- Once a student appears, he cannot attempt further ever.
- Once a student logout or finish exam after the exam begins the student cannot attempt further.
- Admins and Teachers can search any records through the search engine
- Temporary questions tables are set on database which randomly selects questions from several teachers and show on question paper

1.2 Objectives

The Online Objective Exam System, known as Quiz Master, enables users to take tests online and generates results automatically based on their answers. It is specifically designed for newcomers' tests conducted by the institute. This online application allows users to take tests and receive instant results.

- The system alleviates examiners' fatigue caused by checking a large number of answer sheets. It achieves this by automating the manual checking process accurately, reducing their workload significantly.
- The system instantly calculates the score and provides results without delay.
- It eliminates human errors that frequently occur during manual checking processes.
- The system delivers an impartial and unbiased result.
- Therefore, the system eliminates the need for human effort, saving both time and resources.

1.3 Roles in Project

There are three main roles in the system. Admin, teacher and student. Admin has complete access to the whole system, teacher has a limited access relative to the admin, while the student is the role that is responsible for the use of the system.

1.3.1 Admin Role

The Admin role can be as follow:

- Manage teachers
- Manage students
- Search records
- Manage registration
- Student his/her qualification
- Management of admins

1.3.2 Teacher Role

The teacher role can be as follow:

- Add student
- View student details
- New question
- Manage questions

1.3.3 Student Role

The student role can be as follow:

- Appear in exam
- Check result

1.4 PURPOSE OF THE PROJECT

The project aims to manage student information related to registration and exams. Its main goal is to unify different parts of the institution, making it easy for both technical and non-technical people to handle complex tasks. Students can take online tests from home with specific time limits and rules in place. School administrators will have access to records of all students and teachers, including their marks. Teachers can create exams, add questions, and check students' work comfortably from their homes.

The project aims at the following matters:

- To manage the information of student, teacher and admins.
- Consistently update information of all the students and questions.
- Automation of registration and attempting exams available.

All the above-mentioned matters are to be incorporated in the application along with some additional requirements.

The main purpose of the Admin module is to introduce new things and configure important aspects. For example only admin is authorized to approve students, introduce new teachers and admins etc. The master screens for all these are visible to only admin role. This is done by the Admin module. It also can create the users and Physical and Logical Locations. Thus the main purpose of the Admin module is to managing the dynamic working of the system.

1.5 SCOPE OF THE PROJECT

The Scope of the project includes the following.

- This system allows students to complete all their registration and approval tasks.
- Provide a digital workspace
- Offer support in multiple languages.
- Provide assistance and maintenance for the application after it is launched and in active use.

- The Admin module can be used again for other projects with multiple users and different access levels. It is designed to be reusable.

1.6 SOFTWARE TOOLS USED IN PROJECT

1. Visual Studio
2. SQL Management Server

1.6.1 Visual Studio

Microsoft Visual Studio is a software tool created by Microsoft. It helps people build computer programs, websites, web apps, web services, and mobile apps. Visual Studio uses Microsoft technologies likWindows API, Windows Forms, Windows Presentation Foundation, Windows Store, and Microsoft Silverlight are different technologies and frameworks developed by Microsoft for creating software applications. This tool can create different types of code, both native and managed, making it versatile for various applications.

1.6.2 SQL Management Server

SQL Server Management Studio (SSMS) is a software program introduced alongside Microsoft SQL Server 2012. It offers both script editors and graphical features to interact with the server's objects and functions. This makes it easier to handle different aspects of SQL Server, enhancing the management and administration of the database system.

Chapter 2
EXISTING SYSTEM

2.1 Manual system

In a manual online examination system, several challenges are prevalent. Data duplication occurs when paper-based answer sheets are manually transcribed into digital formats, leading to errors and confusion. The lack of robust security measures makes the system vulnerable to cheating and unauthorized access, compromising the integrity of exams. Common errors, such as misinterpretation of handwriting or data entry mistakes, can distort results. Inconsistencies in evaluating subjective answers can arise due to varying interpretations by different examiners. Repetition of work happens as staff spends excessive time organizing, distributing, and evaluating paper-based exams, leading to inefficiency. Excessive paperwork not only consumes physical space but also adds to administrative overheads. Retrieving and cross-referencing data manually is time-consuming, hindering timely analysis. Moreover, manual systems are prone to human error, affecting the accuracy and reliability of exam results. Addressing these issues through the implementation of an automated online examination system can significantly enhance efficiency, accuracy, and security in the assessment process.

2.1.1 Training Problems

- The challenges related to training and advising people involve instilling discipline to input data into the maintenance system
- Acquiring reports becomes problematic due to the effort needed to find meaningful data and statistics within the system.
- Designing effective registers and logs proves difficult.
- Additionally, summarizing data and generating reports consumes a significant amount of time.
- Considering that time equals money, this process incurs costs related to both time and employees' efforts.

2.1.2 Data Duplication

Workers often repeat the same data because they struggle to keep track of documents, information, and transactions.

2.1.3 Lack of Security

Student data being accessible across various parts of the institution can be risky. If this information falls into the wrong hands, it could be misused against both the institution and the students, leading to potential blackmail and harm.

2.1.4 Common Errors

Errors can occur when entering student information due to accidental switches or mistakes, especially when the data is handwritten.

2.1.5 Inconsistency of Data

Manual filling of data poses a risk of misplacement, leading to unavailability for future use. This may result in improper preservation of data, causing potential issues when needed later on.

2.1.6 Repetition of Work

Making changes in the data requires re-entering the information. Sometimes, employees forget to make the changes or may redo them without realizing they were already altered. This process is time-consuming and can lead to confusion and inefficiency.

2.1.7 Too much Paper Work

Handling everything manually on paper leads to excessive paperwork due to the need to write down every detail.

2.1.8 Space Consuming

Storing data and papers in filing cabinets takes up a lot of space. As the amount of work done on paper increases, the need for additional filing cabinets also grows, leading to space constraints.

2.1.9 Slow Retrieval of Data

Student information stored in different sections of the library causes delays in retrieving data, making it time-consuming to find relevant student information.

2.2 Cost Benefits Analysis

The main goal of computerized systems is to process data efficiently. This involves designing systems that can achieve this objective effectively. In computerized systems, tasks are automated, replacing the need for manual work and reducing the number of personnel required for data processing. Unlike the manual system, where information is scattered and stored in separate registers, computerized systems consolidate all necessary information into one file, minimizing resource wastage. Additionally, computerized systems allow for immediate access to information, providing quick and cost-effective access to data compared to manual methods.

Chapter 3
PROPOSED SYSTEM

owing to the number of drawbacks evident in the existing system, an automated solution is purposed. The proposed system arms to remove most of the drawbacks found extensively in the existing system. The Proposed system is aimed to simplify the complex and redundant process. The proposed system being developed as a replacement for the existing system is a graphical user interface with good interactions with the database.

Hence proposed system is complete automation. The proposed system has been developed mainly under HTML front-end and ASP.Net as back-end. Thus proposed system attempts to solve all the drawbacks of the existing system.

3.1 FEATURES OF PROPOSED SYSTEM

- All the data will be stored on a more secured media that is computer.
- There will be proper reporting of the registered users and their activities by the institute.
- No lengthy calculation will be required for stocking, as it will be calculated automatically
- User record will be incremented or decremented automatically according to the institution roles.

3.2 ADVANTAGES OF PROPOSED SYSTEM

3.1.1 Time Efficient

As the main focus of computer technology is to give greater output in short span of time. So the Quiz Master is going to be computerized with the same aim.

3.1.2 Reduction of Duplicate/Redundant Data

The proposed system will be stored on a central point. All applications depend on each other therefore before any insertion or updating the data is checked against the referential integrity rule. This also removes the chances of inconsistency.

3.1.3 Backup Facility

Workers don't need to be concerned about data loss or record issues because the proposed system will always have a backup available to assist.

3.1.4 Reduction of Workload

The main focus to change the manual system into computerized ones is to reduce the workload on behalf of an organization. All the calculations and reporting is made by the computer which decreases the workload.

3.1.5 Immediate Response

With this proposed system workers will not have to stick with lengthy reporting and digging into thousands of files to the required data for generating reports.

3.1.6 Cost Effective

Computerized system is cost effective in a since that it doesn't require a lot of stationary adding and other requisites mainly involved in manual system. As the computer does most of the work, therefore the management will not have to employ extra worker for each and every task.

3.1.7 Reduction of Storage Space

As in normal system where all records are saved on a bundle of tiles and registers. But the computerized system facilitates the company to store the same data or much on a simple hard disk.

3.1.8 User Friendly

The proposed system is designed with a user-friendly interface so that users do not fell any difficulty during the work and can easily communicate with the system.

3.1.9 Flexible

The proposed system will be more flexible to adopt changes that come in the examination management as it grows with the time.

3.2 Feasibility Study

Feasibility assesses the practicality and benefits of developing an information system for an organization. Feasibility analysis is the method used to measure this feasibility, helping organizations make informed decisions about the viability and potential success of implementing a new information system.

In today's fast growing technological environment, it is imperative for any organization- be it a corporate or government one -to use the power of information technology. The benefits of computerization will not only make the process flow simple but also uplifts standards for manpower working in an organization and increase efficiently and productivity.

It is very important to do preliminary investigations regarding the development of the system; likelihood the system will be useful for the organization. Thus before implementing the project, it is necessary to test the feasibility of the project. As an implementing the project, it is necessary to test the feasibility of the project. As an outcome of feasibility analysis phase, the feasibility of the system is determined. The feasibility of the system checks whether the system is able to efficiently provide the facilities for which it was intended and he likelihood of the system being useful to the organization.

3.2.1 Tests of Feasibility

- Operational Feasibility
- Technical Feasibility
- Economic Feasibility
- Time Schedule Feasibility

- Implementation Feasibility

3.2.2 Operational Feasibility

The proposed system will meet the following operational requirements of the organization. Find the borrower record according to his/her name or ID. The administrator can perform Add, Edit, Update and Delete Operation.

3.2.3 Technical Feasibility

The system development is technically feasible because all the necessary technological requirements for development and deployment are met. Familiar software and hardware environments/tools will be used for the system's development, ensuring a smooth and efficient process.

3.2.4 Economic Feasibility

Economic analysis, often called cost/benefit analysis, helps assess a system's effectiveness. It compares the expected benefits and savings with the system's costs. If benefits exceed costs, the system is designed and implemented. For a new system to be a good investment, its financial benefits must outweigh development costs. Economic feasibility evaluates these factors to determine the system's financial viability for the organization.

- The cost to investigate a system completely.
- The expenses for the equipment and computer programs needed for a specific type of task or activity.
- The advantages come in the form of saving money or making fewer expensive mistakes.
- The expense incurred if things remain the same, meaning if the new system is not developed.

3.2.5 Time Schedule Feasibility

The institute gave enough time for the project. So, it is enough for implementing this project. So, we can say that the project is feasible in terms of schedule.

3.2.6 Implementation Feasibility

The organization provides us with all the facilities required for developing the system. All websites required for the development of the system are provided by the organization, which makes the project feasible in implementing the website and drivers are downloaded from the internet.

Chapter 4
REQUIREMENTS

The term "requirement" refers to a detailed description of what the system should do. An SRS (Software Requirements Specification) essentially outlines these requirements. When requirements are well-defined, the software design process is logical and efficient. In contrast, poorly defined requirements lead to awkward designs and make coding more challenging.

4.1 A quick and basic summary

This difference becomes clear when we separate user requirements and system requirements. User requirements are general and abstract needs and expectations. In contrast, system requirements offer detailed descriptions of what the system must do to fulfill those user needs.

4.2 General Description

The general descriptions are given below.

4.2.1 Product Perspectives

The need of this application is to computerize the manual system of examination system. All the work done and record saving is in files and notepads so this application will replace this system of the institution by a secure and efficient system which will reduce the burden of the staff and work will be more reliable with little or less redundancy.

4.2.2 Product Functions

In the initial analysis, the proposed system includes the ability to manage data and user information. The software will have a user management component. The information stored in the software will be rigorously checked using a Database Management System (DBMS) and user-defined checks in the interface.

4.3 Admin Characteristics

Users are expected to have basic computer knowledge, and we will provide a step-by-step user manual for using the application. The software will feature a user-friendly Graphical User Interface (GUI) to make it easy for users to navigate and operate. Additionally, a guidance system will be integrated into the interface, helping users by providing information about the system and assisting them in case of errors.

4.4 General Constraints

The constraints of Quiz Master include the need for a user-friendly interface, specific operating environment requirements, ensuring reliability, and adhering to policies that might influence the system's design and functionality.

4.4.1 The Product or Software

Computer of Quiz Master is an individual system. The information system being developed is using different facilities of the DBMS like different structured query commands to provide the admins with required functionalities.

4.4.2 Specification Requirements

Users will have the capability to log into the Quiz Master Software using their unique username and password.

4.5 Functional Requirements

The functional requirements of this system will include the following

- Registration
- Teachers/Admins record
- Students record

- Reports

4.6 Non-Functional Requirement

Non-functional requirements define how a system should behave and set constraints on its operation. These requirements encompass aspects that are not directly related to specific functions but are crucial for the system's overall performance and user experience. They include criteria for system operation, constraints on development processes, timing constraints, and adherence to standards. The non-functional requirements for this system will be specified as follows

4.6.1 Performance

The computerized system will offer quick and current information about all activities, reducing the time needed for processing and accessing information.

4.6.2 Usability

Once the application is implemented, the staff will receive training for the necessary duration. This training will enable them to effectively operate the system.

4.6.3 Reliability

These measures will enhance the program's performance and ensure its correctness. The developed system will be reliable for the users.

4.6.4 Documentation

Each and every activity performed within the project phases is documented. All the software tools and techniques applied are also documented. This documentation is of great deal to the organizations.

4.7 Design Constraints

There are a number of factors in the client’s environment that may restrict the choices of a designer. Such factors include standards that must be following, resources limits, and operating environment,

reliability and security requirements and policies that may have an impact on the design of the system. Standards compliance is requirements for the standards the system must follow. Hardware limitations are none as the required hardware is already available in the organization. Operating system are already available, languages are supported by the user and organization. Primary and secondary storage limitations are also covered.

4.8 Process

Rules can include institute regulations, and all the various algorithms and computations applicable within a specific domain. Although they exist outside the boundary of the system, they nonetheless influence its functionality. The following statements are examples of the types of rules that may he applicable.

4.9 Consistency

A Quiz Master is developed in such a way that most of the errors are handled, avoiding the site to crash thus giving stability to the application. DBMS constraints and checks are also ensured that the data in the DBMS is stable and secure. So overall the software will be consistent in sense of operations.

4.10 Required Deliverables

4.10.1 Requirement Specification Documentation

This document outlines the fundamental user needs in easy language, which developers can later translate into detailed development statements. The Software Requirements Specification (SRS) includes user requirements categorized into system, user, functional, and non-functional requirements. These characteristics are evident in this chapter. The Requirements Analysis and Specification chapter acts as the SRS for the project.

Chapter 5
SYSTEM DESIGN

Database designing is a crucial aspect of website development, encompassing three distinct phases.

- Conceptual database design
- Logical database design
- Physical database design

5.1 System Design

Conceptual database design centers on grasping the requirements gathered from users. It involves identifying entities (such as customers or products) and their relationships. The process includes several fundamental steps:

- Identify the Entities
- Relationship among Entities
- Attributes
- Primary and Foreign keys
- Entity Relationship Diagram

5.1.1 Identified Entities

In Quiz Master, the following entities have been identified:

- Admin/ Employee
- Test
- Teacher
- Student
- Test Question Data Bank
- ClassDomain
- Student Appear Test
- Student Register For Test

- Test Question
- Subject
- User

5.1.2 Association of Attributes with Entities

Table Name: Admin/ Employee

Description: This table is for data of admins.

Column Name	Data Type	Allow Nulls
employeeId	bigint	☐
employeeName	varchar(MAX)	☑
employeeFName	varchar(MAX)	☑
DOB	datetime	☑
Email	varchar(50)	☑
Contact	nvarchar(50)	☑
userId	bigint	☑
subjectId	bigint	☑
		☐

Table 5.1 Admin

Table Name: Test

Description: Test category will be stored here

Column Name	Data Type	Allow Nulls
testId	bigint	☐
testTitle	varchar(MAX)	☑
startTime	nvarchar(50)	☑
endTime	nvarchar(50)	☑
graceTime	int	☑
testConductionDate	datetime	☑
		☐

Table 5.2 Test

Table Name: Employee

Description: This table is for teacher details which will be stored here

Column Name	Data Type	Allow Nulls
employeeId	bigint	☐
employeeName	varchar(MAX)	☑
employeeFName	varchar(MAX)	☑
DOB	datetime	☑
Email	varchar(50)	☑
Contact	nvarchar(50)	☑
userId	bigint	☑
subjectId	bigint	☑
		☐

Table 5.3 Teacher

Table Name: Student

Description: In this table student will added and will assign for the selected Test.

Column Name	Data Type	Allow Nulls
studentId	bigint	☐
studentName	nvarchar(MAX)	☑
studentFName	nvarchar(MAX)	☑
gender	tinyint	☑
DOB	date	☑
email	nvarchar(50)	☑
contact	nvarchar(50)	☑
userName	nvarchar(50)	☑
password	nvarchar(MAX)	☑
studentPicture	varchar(250)	☑
		☐

Table 5.4 Student

Table Name: Test Question Data Bank

Description: All the question from exam category are stored here.

Column Name	Data Type	Allow Nulls
questionId	bigint	☐
questionTitle	varchar(MAX)	☑
choiceA	varchar(MAX)	☑
choiceB	varchar(MAX)	☑
choiceC	varchar(MAX)	☑
choiceD	varchar(MAX)	☑
subjectId	bigint	☑
questionClassId	bigint	☑
correctChoice	nvarchar(1)	☑
description	nvarchar(MAX)	☑
chapter	int	☑
qType	int	☑
correctChoiceForAll	nvarchar(MAX)	☑
		☐

Table 5.5 Question

Table Name: Class Domain

Description: In this table the students class names will be stored.

Column Name	Data Type	Allow Nulls
classid	bigint	☐
classTitle	varchar(50)	☑
		☐

Table 5.6 Question

Table Name: Student Appear Test

Description: In this table the students will be appeared and their result will be stored.

Column Name	Data Type	Allow Nulls
studentAppearId	bigint	☐
testId	bigint	☑
studentId	bigint	☑
questionId	bigint	☑
correctChoice	varchar(1)	☑
		☐

Table 5.7 Student Appear Test

Table Name: Student Register For Test

Description: In this table the students registration for test data will be stored.

Column Name	Data Type	Allow Nulls
srTestId	bigint	☐
studentId	bigint	☑
testId	bigint	☑
userName	nvarchar(MAX)	☑
password	nvarchar(MAX)	☑
testStatus	bit	☑
status	nvarchar(50)	☑
		☐

Table 5.8 Student Register For Test

Table Name: Test Question

Description: In this table the test marks will be stored.

Column Name	Data Type	Allow Nulls
testQuestionId	bigint	☐
questionId	bigint	☑
testId	bigint	☑
marks	int	☑
		☐

Table 5.9 Test Question

Table Name: Subject

Description: In this table the test marks will be stored

Column Name	Data Type	Allow Nulls
subjectid	bigint	☐
subjectTitle	varchar(MAX)	☑
class	varchar(50)	☑
		☐

Table 5.10 Subject

Table Name: User

Description: In this table the Admin/Employee user name and password data will be stored

Column Name	Data Type	Allow Nulls
userId	bigint	☐
userName	varchar(MAX)	☑
userPassword	nvarchar(20)	☑
ucontrol	nvarchar(20)	☑
		☐

Table 5.11 User

Table Name: Question Type Domain

Description: In this table the question type will be saved.

Column Name	Data Type	Allow Nulls
qType	int	☐
typeTitle	nvarchar(MAX)	☑
		☐

Table 5.12 question type domain

5.1.3 Identify Primary and Foreign Keys

- **Keys**
  Keys are special fields in a database that have two main roles. They uniquely identify records and make it easier to search for specific information in the database.
- **Primary Keys**
  A key in a table is a special field that must have a unique value for each record and cannot be left empty (null) or repeated.

- **Foreign Keys**

  A primary key is a field in a table that is chosen as the main identifier for that table. This primary key field is then used as a reference in another table, where it becomes a field called a foreign key.

5.2 ERD (Entity Relationship Diagram)

An Entity-Relationship Diagram (ERD) is a visual tool used in database design. It shows the different entities in a database and how they are related to each other. ERDs help in understanding the structure and connections within a database system.

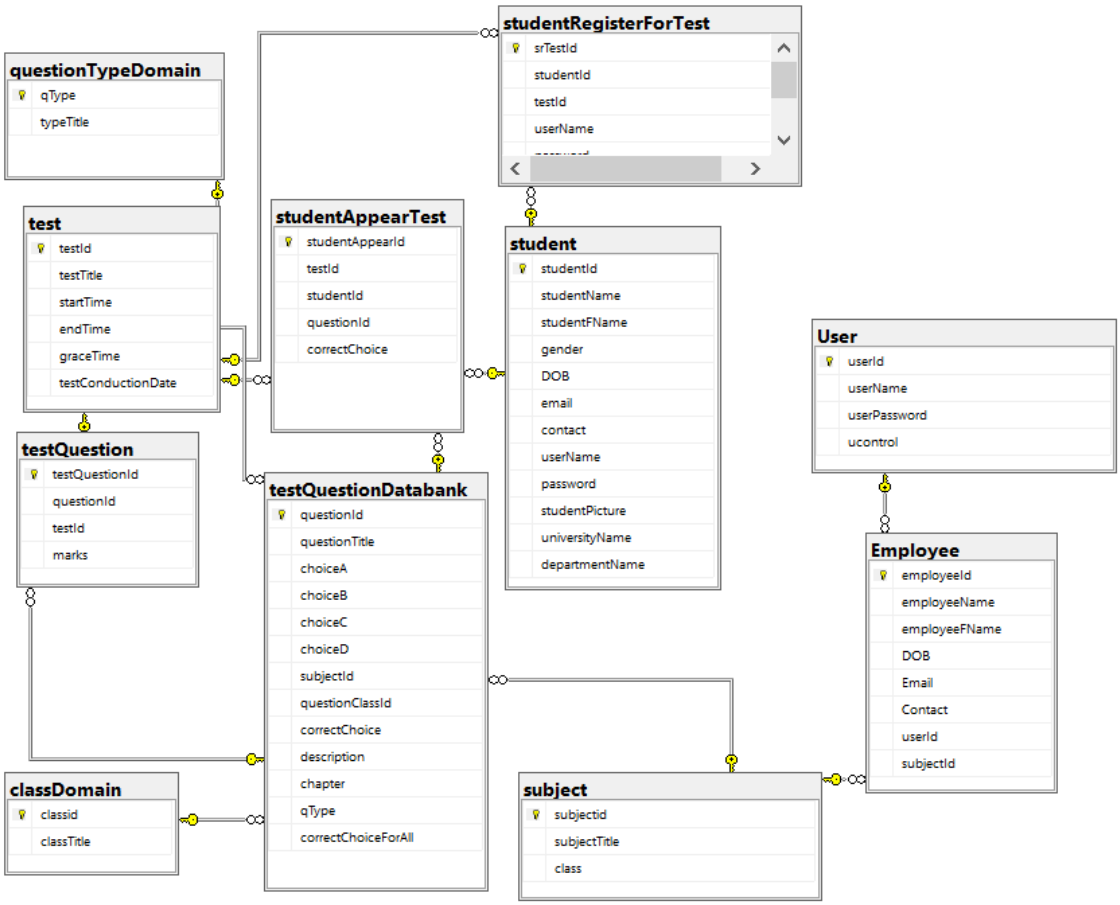

Fig 5.1 ERD (Entity Relation Diagram)

5.3 Functional Modeling

Functional modeling indicates how data are transferred within system information or data is transferred as it flows through a system. The system accepts input in variety of forms and produces output in a variety of forms. For functional modeling Data Flow Diagram (DFD) are used.

5.3.1 DFD (DATA FLOW DIAGRAM)

A Data Flow Diagram (DFD) is a visual way to show how data moves within an information system. It helps illustrate processes from a data perspective, showing how information flows through various parts of the system. DFDs provide a clear picture of how the system functions, what it achieves, and how it will work once detailed specifications are added during refinement.

5.3.1.1 LEVEL 0

A high-level Data Flow Diagram (DFD) illustrates the significant processes, data flows, and data storage in a system with detailed information..

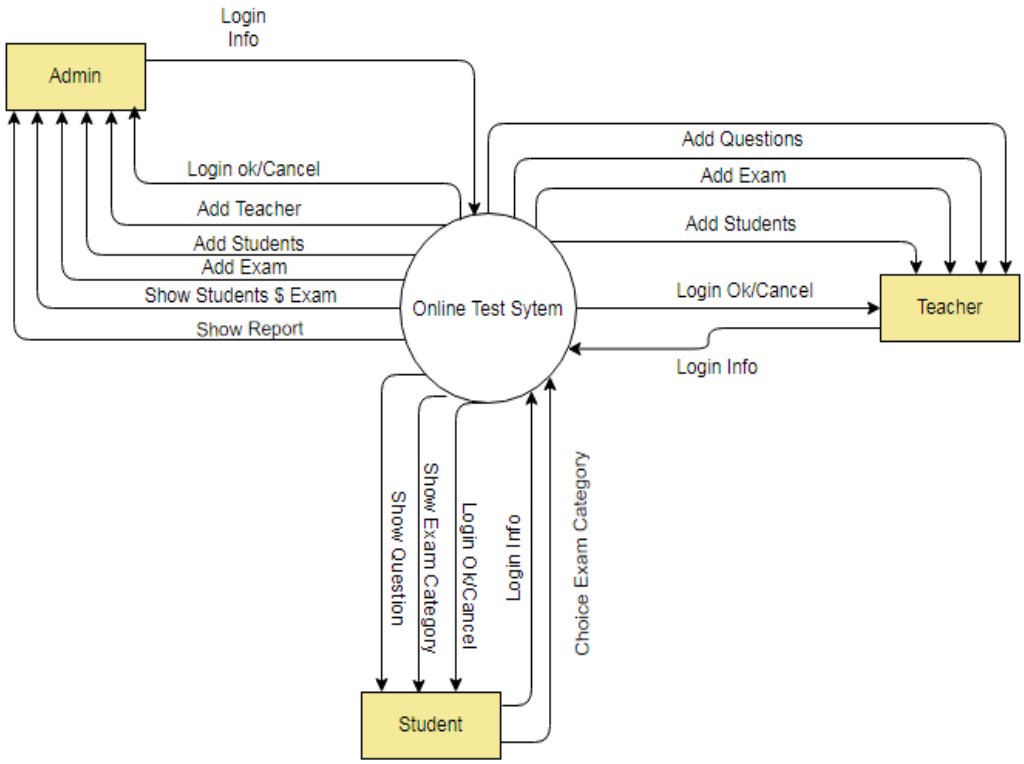

Fig 5.2 Level 0 DFD (Data Flow Diagram)

5.3.1.2 LEVEL 1

A high-level Data Flow Diagram (DFD) illustrates all the processes, data flows, and data storage in a system in great detail. It provides a comprehensive overview of the system's operations and data movement at an advanced level.

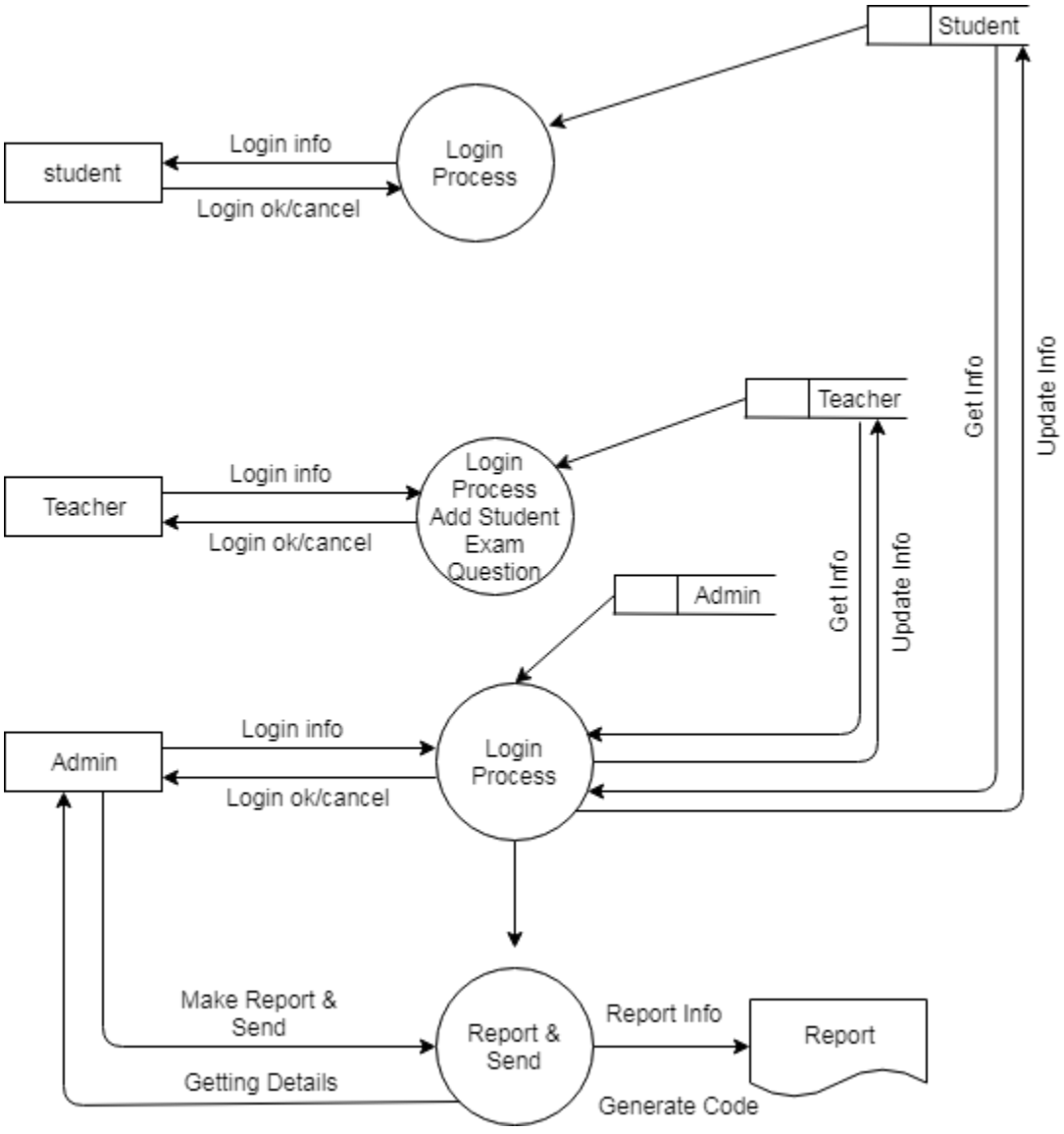

Fig 5.3 Level 1 DFD (Data Flow Diagram)

5.4 Interface

An interface is how a computer program shows information to users and receives input from them, including screen layouts and menus. This manual explains how users can interact with the software, helping them understand how the system works. It's designed to be user-friendly, making it easy for both experienced users and newcomers. The system's operation is straightforward, and all screens and options are self-explanatory, ensuring users won't face difficulties. The website is compatible with updated web browsers, specifically designed to fit various device screens. The interface design is based on activities collected during the analysis phase, ensuring a seamless user experience.

So for now, we have the following entities.

Admin Panel:

1. Admin Login
2. Admin Home
3. Add Teacher
4. Teacher List
5. Update Teacher
6. Add Student
7. Student Details
8. Add Test
9. Add Questions
10. Question Databank
11. Add Subject
12. Subject List
13. Forgot Password

Teacher Panel:

1. Teacher Login
2. Teacher Home

3. Add Student
4. Student Details
5. Add Question

Student Panel:

1. Student Login
2. Student Home
3. Attempt Questions
4. Result

5.5 Admin Panel

5.5.1 Admin Login

Description: A simple login page for admins of the institution.

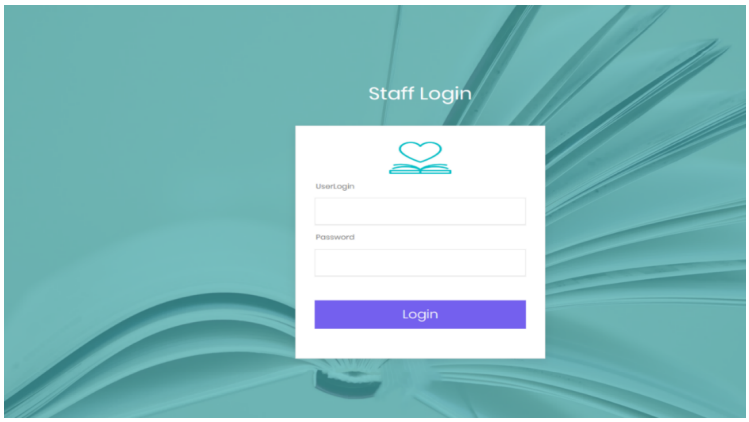

Fig 5.1 Admin Login

5.5.2 Admin Home

Description: Home page for an admin.

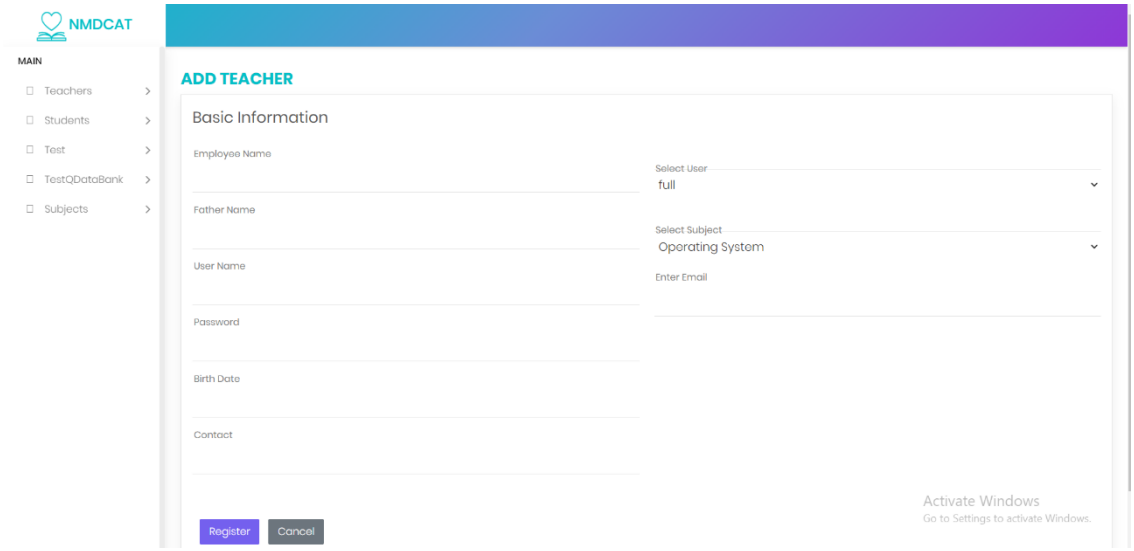

Fig 5.2 Admin Home

5.5.3 Add Teacher

Description: Admin will assign teacher to related discipline.

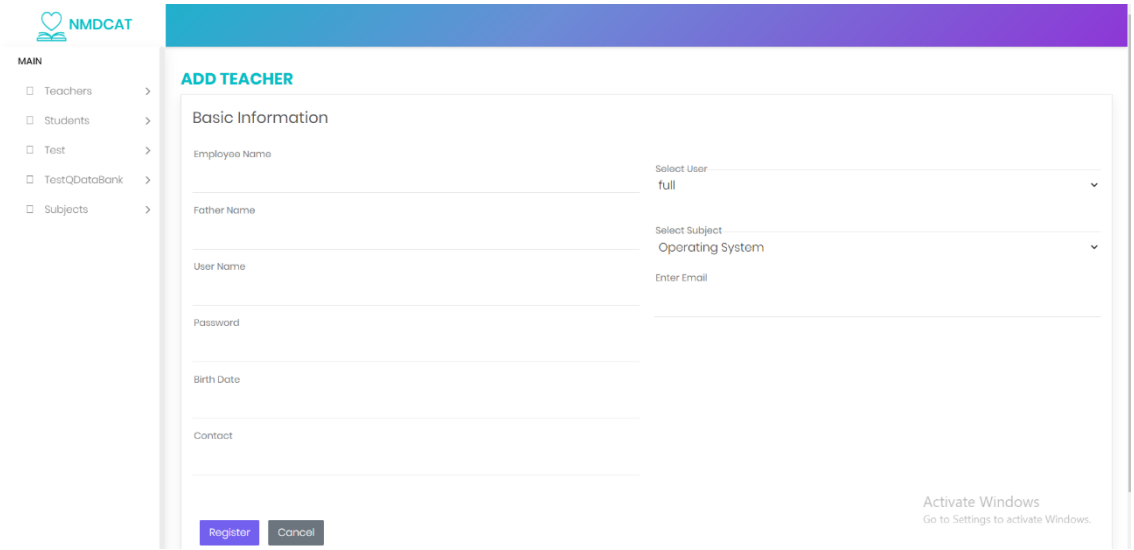

Fig 5.3 Admin will add teacher

5.5.4 Teacher List

Description: Admin will see all teachers.

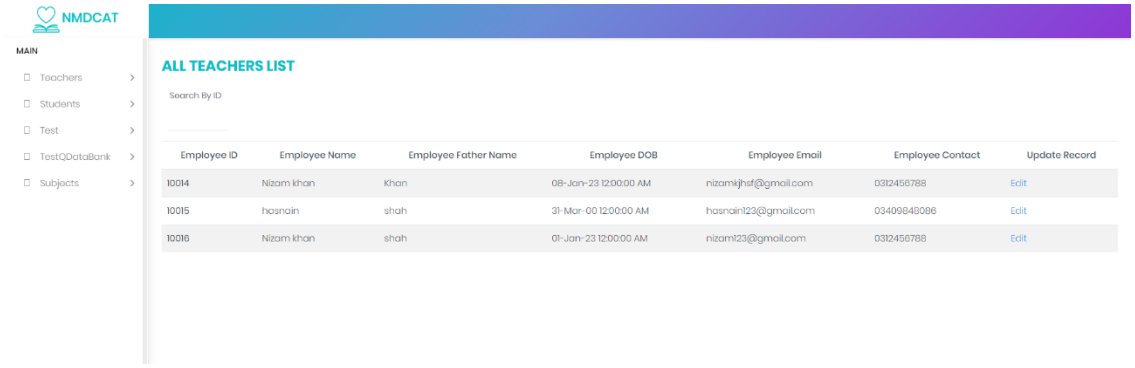

Fig 5.4 Teacher List

5.5.5 Teacher Update

Description: Teacher details will be updated here.

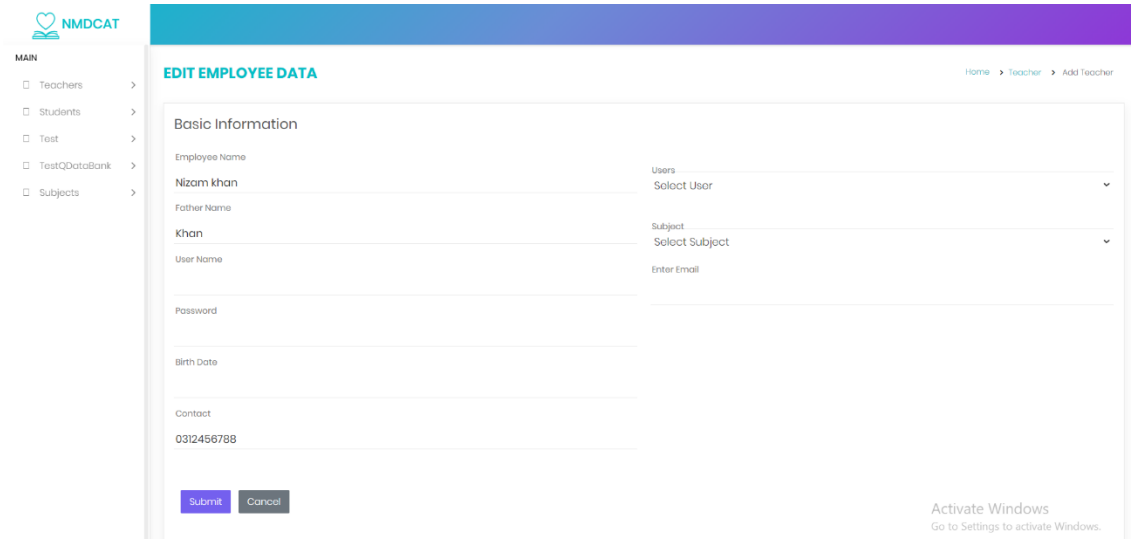

Fig 5.5 Teacher Update

5.5.6 Add Student

Description: Admin will add student in this section

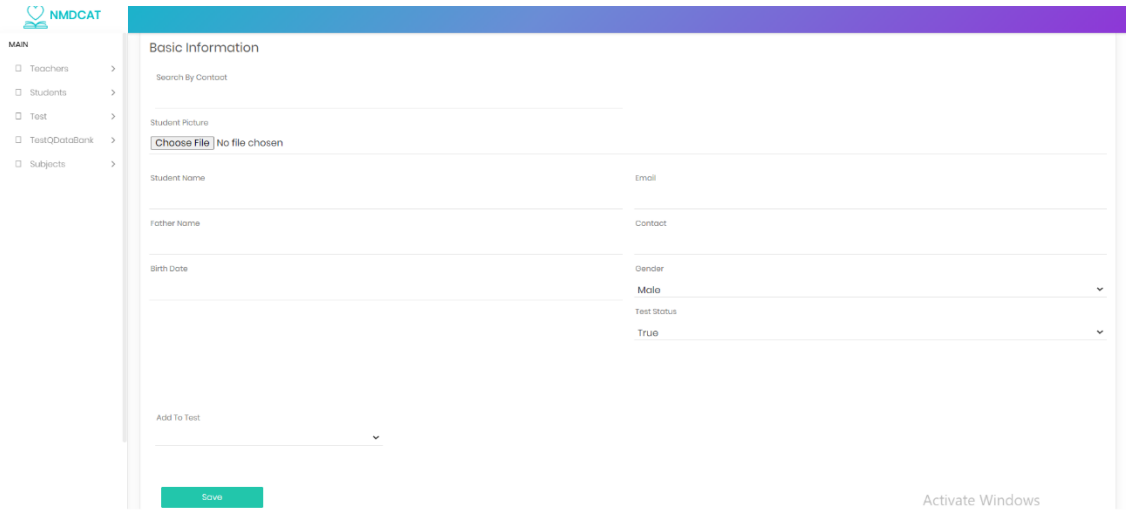

Fig 5.6 Add Student Page 1

5.5.7 Student Details

Description: All added student will be displayed here.

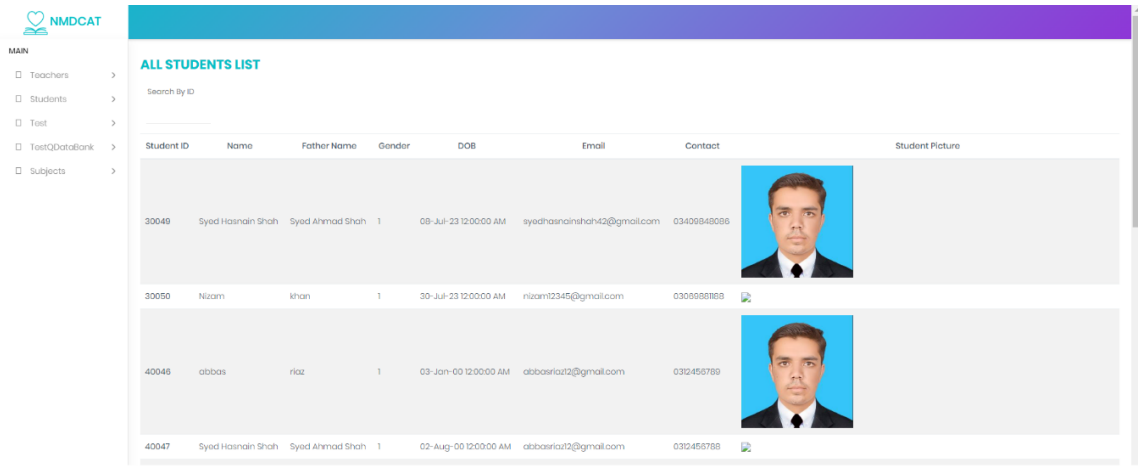

Fig 5.7 Student Details

5.5.8 Add Test

Description: Admin will add test here.

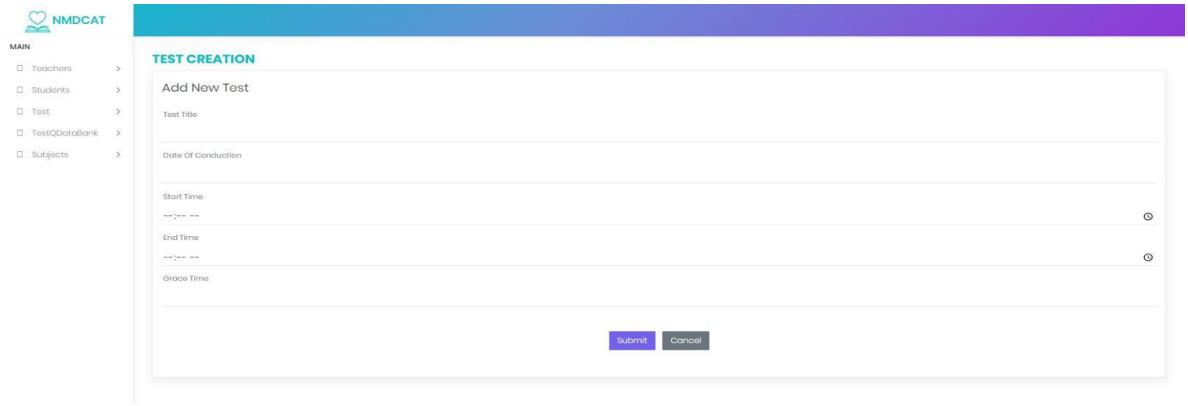

Fig 5.8 Add Test

5.5.9 Adding Questions

Description: Admin or teacher will add questions.

Fig 5.9 Add Questions

5.5.10 Question Databank

Description: Admin can only displayed the added questions which is added by teacher.

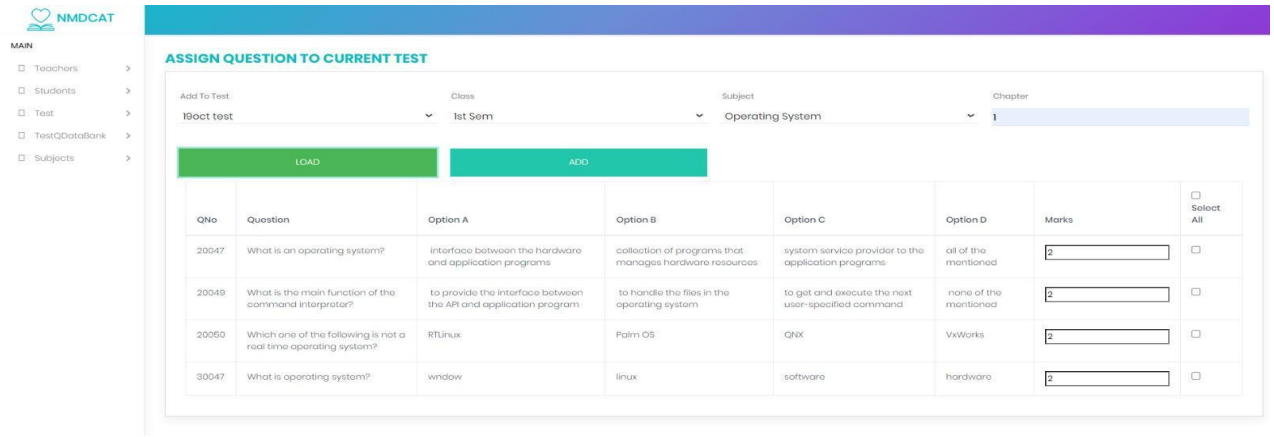

Fig 5.10 Question Databank Details Page

5.5.11 Password Change

Description: Admin will change its password from here.

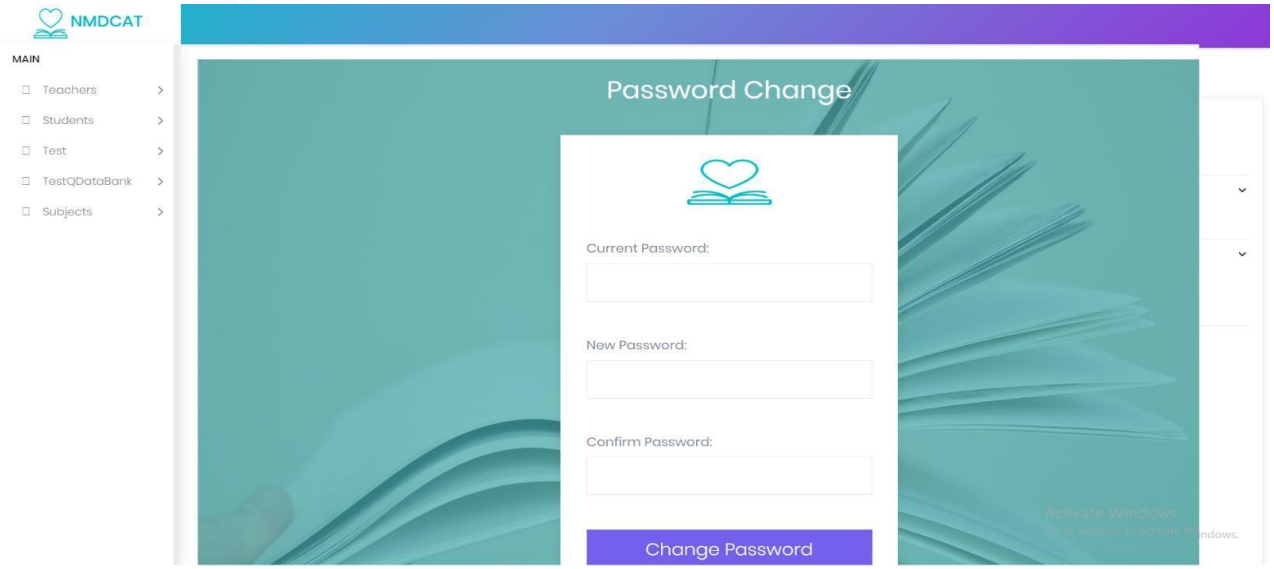

Fig 5.11 Password Change

5.5.12 Add Subject

Description: Admin will add subjects from here.

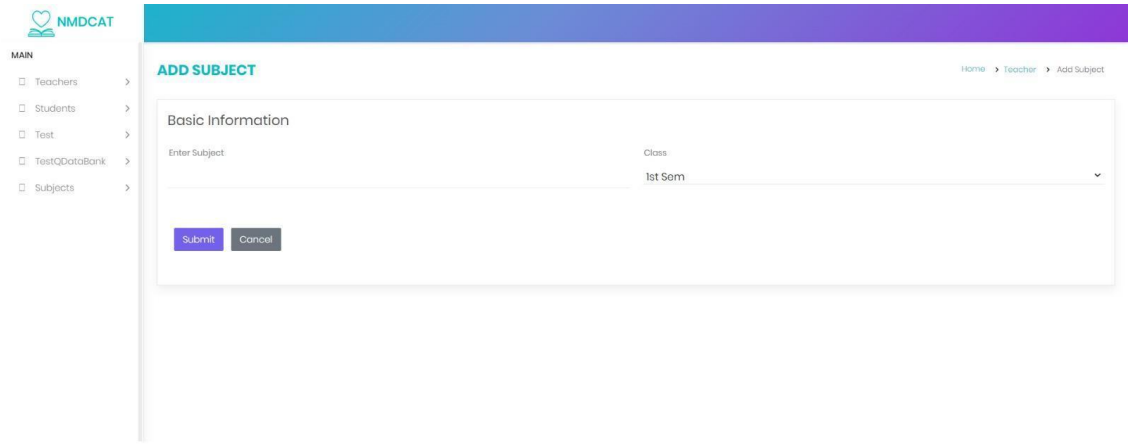

Fig 5.12 Add subject

5.5.13 Subject List

Description: Admin will add subjects from here.

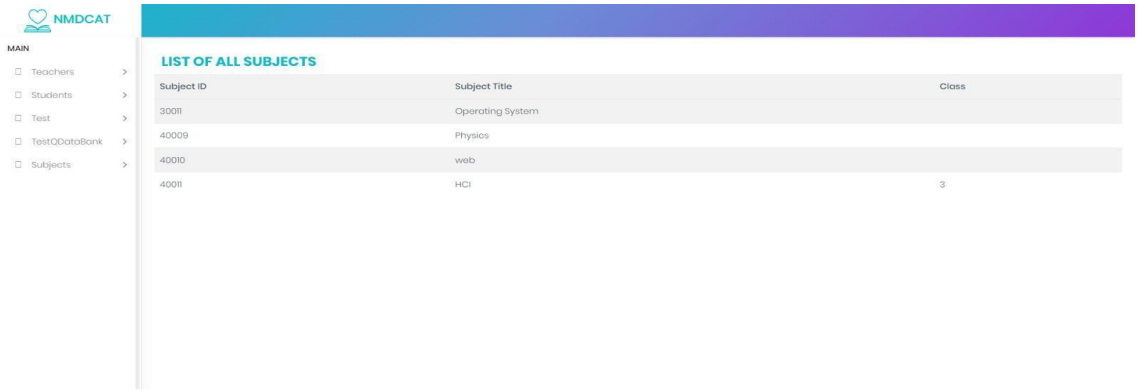

Fig 5.13 subject list

5.6 Teacher / Staff Panel

5.6.1 Teacher/ Staff Login

Description: Simple login page for teachers.

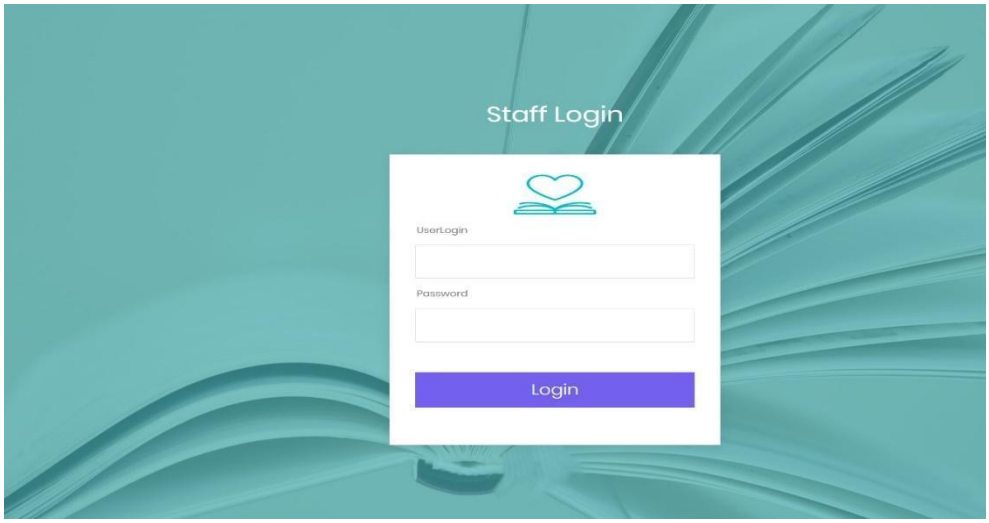

Fig 5.14 Teacher Login

5.6.2 Teacher/ Staff Home

Description: Home page for teachers.

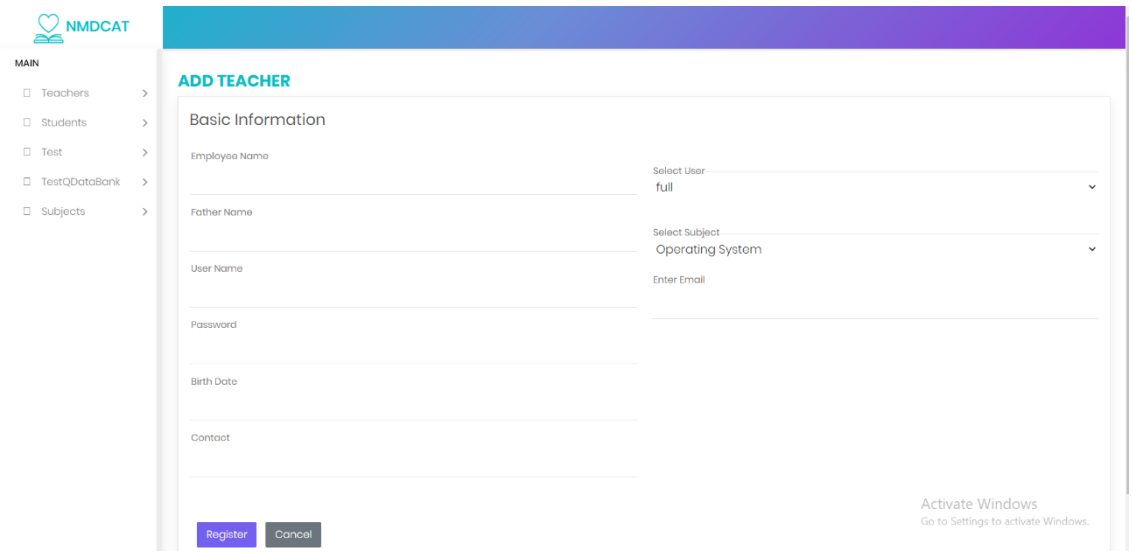

Fig 5.15 Teacher Home

5.6.3 Add Test

Description: Teacher will add test here.

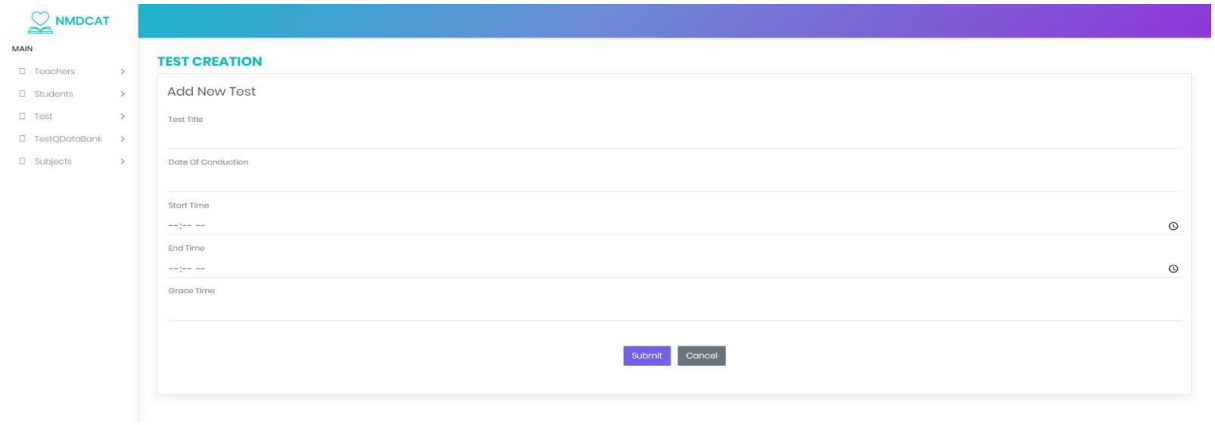

Fig 5.16 Add Test

5.6.4 Add Student

Description: Teacher will add students as well as admin can also add students.

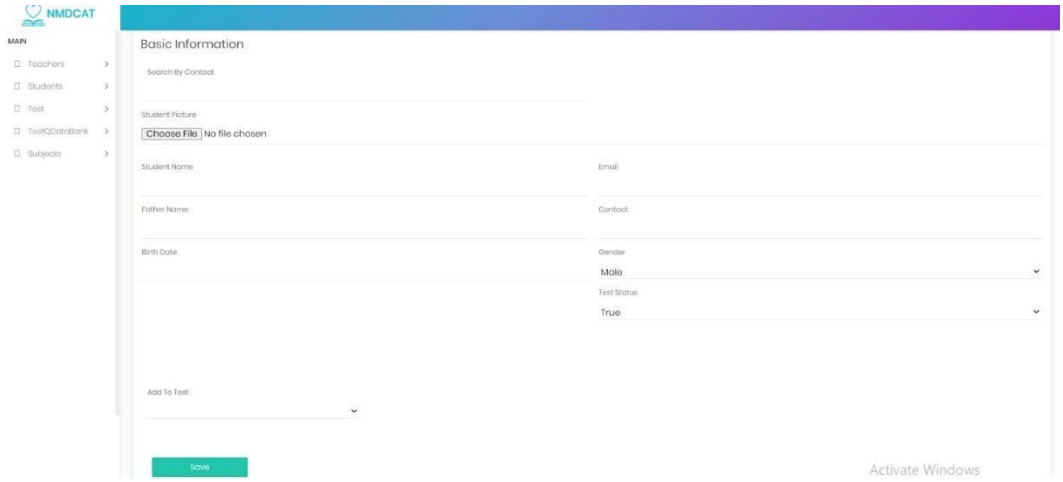

Fig 5.17 Add Student Page

5.6.5 Student List

Description: Added students will be displayed to teacher here.

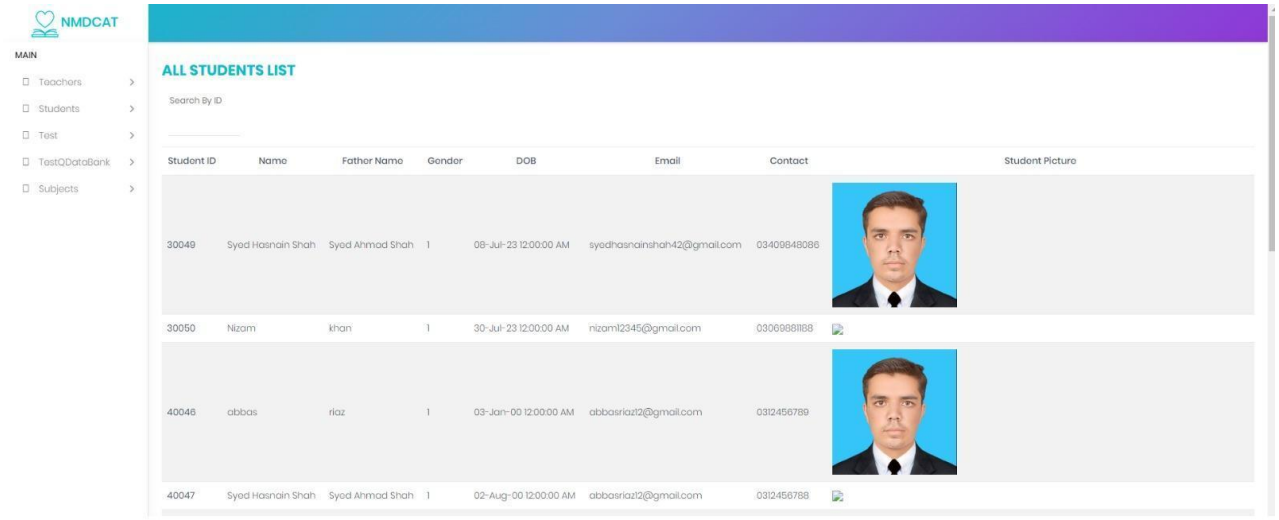

Fig 5.18 Student Details

5.6.6 Add Questions

Description: Teacher will add question to the related discipline.

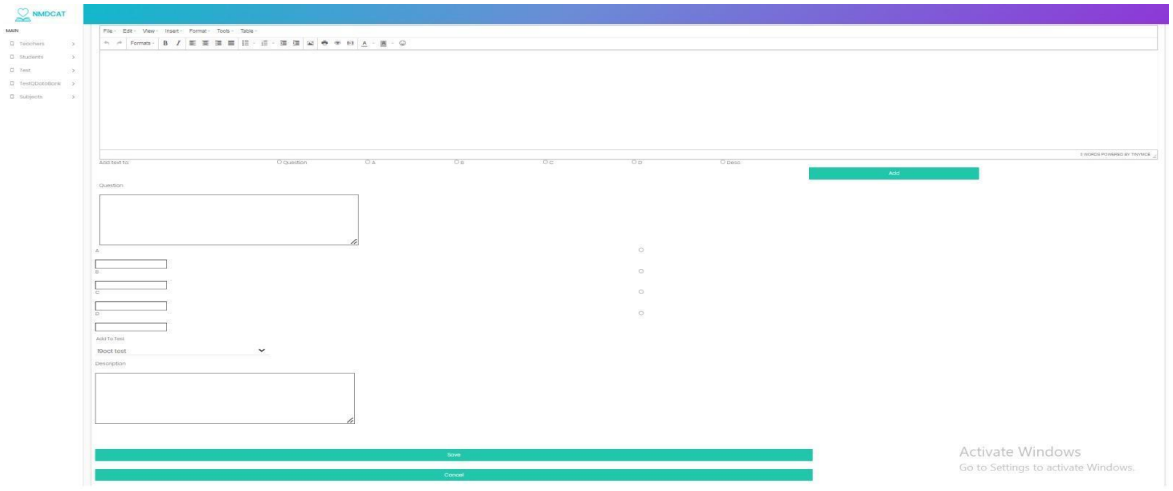

Fig 5.19 Add Question Page 1

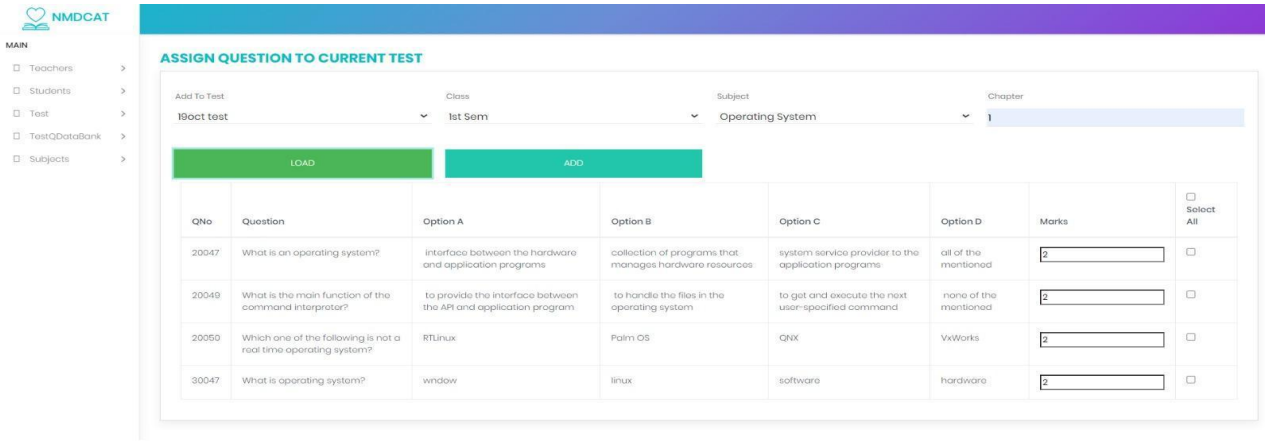

Fig 5.20 Add Question Page 2

5.7 Student Panel

5.7.1 Student login

Description: The login form will ask the student to enter a username and password. If the user inputs the correct username and password, they will be redirected to the home page. However, if the user enters incorrect credentials, they will not be allowed to proceed further.

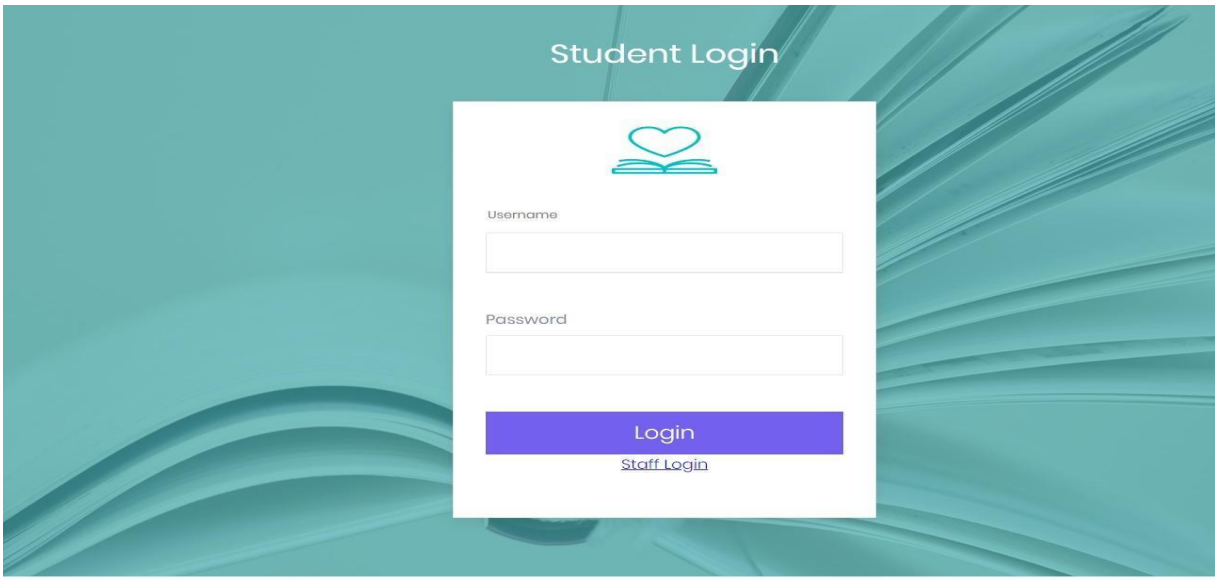

Fig 5.21 Student Login

5.7.2 Student Home Attempt Questions

Description: Test will be appeared here in which test he applied for and test will be started.

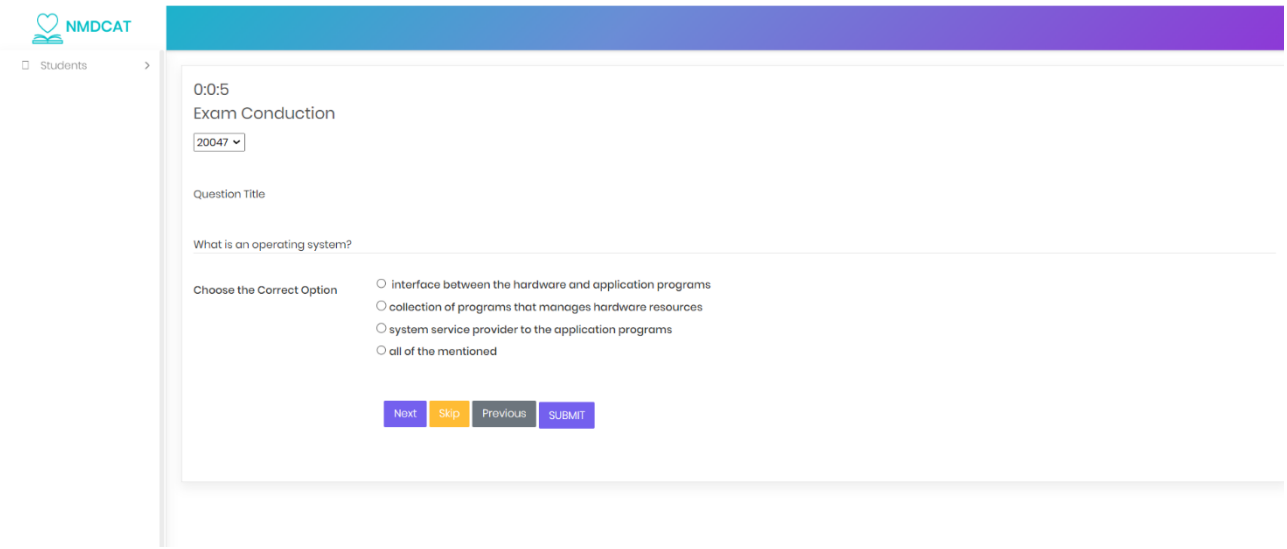

Fig 5.22 Student Home

5.7.3 Result

Description: When someone finish his test before the time out he will click the finish button or when the time's up itself the result will displayed to him.

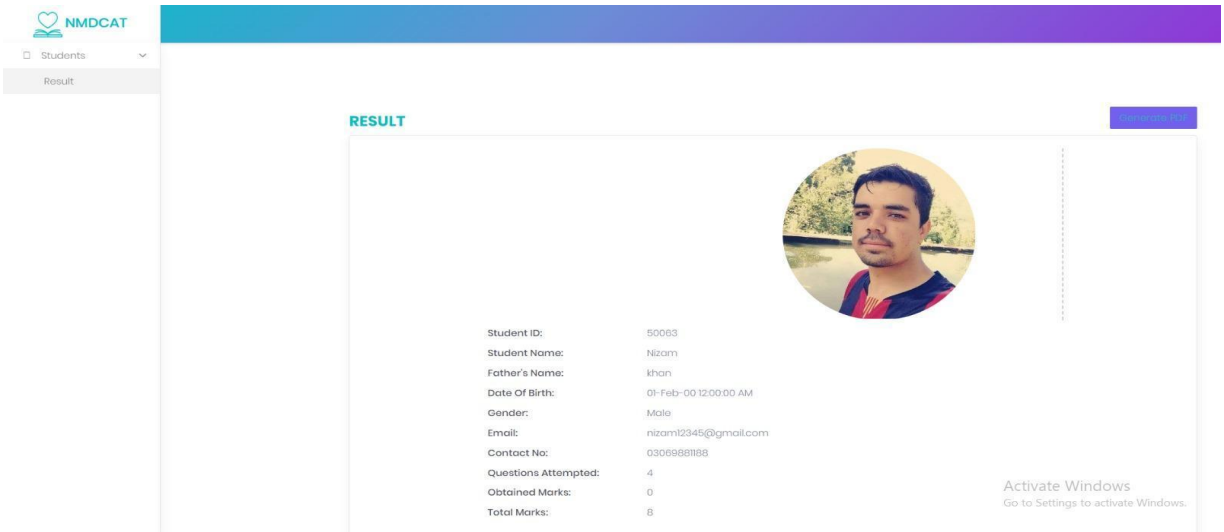

Fig 5.23 Student Result

Chapter 6
TESTING

Software testing is a thorough examination conducted to inform stakeholders about the quality of the software product or service being tested. It offers an objective, independent perspective of the software, enabling businesses to comprehend the risks associated with software implementation. Testing methods involve running a program or application to identify software bugs (errors or defects) and ensuring that the software product is suitable for use.

There are various types of testing that need to be conducted on the web application to ensure its functionality and performance.

6.1 Testing objectives

- Testing is done to find errors and defects in the developed software.
- Testing is performed to verify that the software functions according to the specified requirements and specifications.
- Testing is conducted to ensure that the software meets the specified behavior and performance requirements.
- Testing is carried out to assess the reliability and quality of the software

6.2 Types of Testing

- White box testing
- Black box testing

6.3.1 White Box Testing

White box testing, also known as Clear Box Testing or Glass Box Testing, is a software testing approach where the tester has knowledge about the internal structure, design, and implementation of the item being tested. The tester selects specific inputs to navigate through the code paths and assesses the expected outputs. This method requires programming expertise and knowledge of the software's

implementation details. It's called "white box" testing because the tester perceives the software as a transparent box, allowing them to see inside its workings.

6.3.2 Black Box Testing

Black box testing, also known as Behavioral Testing, is a software testing method in which the internal structure/design/implementation of the item being tested is not known to the tester. These tests can be functional or non-functional, though usually functional. This method is named so because the software program, in the eyes of the tester, is like a black box; inside which one cannot see. This method attempts to find errors in the following categories:

- Incorrect or missing functions
- Interface errors
- Errors in data structures or external database access
- Behavior or performance errors
- Initialization and termination errors

Black box testing is achieved by testing the following three components.

- Unit Testing
- Integration Testing
- System Testing

6.3.3 Unit Testing

Unit testing is a software testing level where individual units or components of a software are tested to validate that each unit performs as designed. A unit refers to the smallest testable part of any software, typically having one or a few inputs and a single output. In procedural programming, a unit can be a program, function, or procedure. In object-oriented programming, the smallest unit is a method, belonging to a base/super class, abstract class, or derived/child class. Unit testing frameworks, drivers, stubs, and mock/fake objects are employed to aid in unit testing. It ensures that each part of the software functions correctly in isolation before integration into the complete system.

6.3.4 Integration Testing

Integration testing is a software testing level where individual units are grouped together and tested collectively. The main goal of this testing phase is to identify issues in the interaction between integrated units. Test drivers and test stubs are employed to support Integration Testing, ensuring that the integrated components work seamlessly together and function as expected within the larger system.

6.3.5 System Testing

System testing is a phase of software testing where the entire integrated software is thoroughly tested. The main goal is to assess whether the system aligns with the specified requirements. This testing process involves evaluating the integrated system to confirm that it meets the predetermined requirements and functions as intended.

Chapter 7
Conclusion

In the ever-evolving landscape of education and technology, our MCQ-based online test system represents a significant leap forward. This system was designed with the singular purpose of empowering students to assess their knowledge and gain insights into their performance instantly. As we draw the curtains on this project, let's reflect on what we've accomplished and what lies ahead:

7.1 Instant Feedback for Learners

The hallmark of this system is the ability to provide instant feedback to students upon test submission. This feature allows learners to understand their performance, identify areas of strength, and pinpoint topics that require further attention. It's a valuable tool for self-assessment and improvement.

7.2 Efficiency and Convenience

Our online test system eliminates the need for manual grading and waiting for results. Students can take tests at their convenience, and the system promptly displays their scores, saving time and reducing administrative overhead.

7.3 Data-Driven Insights

By recording and analyzing student results, we enable educators to gain data-driven insights into the effectiveness of their teaching materials and methods. This system can aid instructors in tailoring their lessons to better meet the needs of their students.

7.4 Adaptability and Scalability

Our system is designed with adaptability and scalability in mind. It can be customized to cover various subjects and levels of complexity. As the user base grows, the system can be expanded to accommodate a larger number of simultaneous users.

7.5 Educational Impact

We believe in the educational impact of technology. This online test system opens new possibilities for enhancing the learning experience. It encourages self-study, revision, and continuous improvement.

7.6 Continuous Improvement

The development of this system is an ongoing process. We will continue to enhance its features, user interface, and security to meet the evolving needs of both students and educators. We welcome user feedback and suggestions for improvement.

7.7 Acknowledgments

We would like to express our gratitude to all the students and educators who have been part of this journey. Your participation, feedback, and trust have been instrumental in the success of this project.

7.8 Future Developments

The world of technology and education is constantly evolving. We are dedicated to keeping pace with the latest trends and innovations. In the future, we plan to introduce new features and tools to further enrich the online learning experience.

7.9 Feedback Loop

Our system is created to facilitate a continuous feedback loop between students and educators. We urge students to share their feedback on test questions, system features, and their overall user experience. Instructors can utilize this feedback to enhance their teaching materials and provide a better learning experience.

7.10 Research and Development

Our commitment to research and development remains unwavering. We will continue to explore cutting-edge technologies and educational methodologies to enhance the capabilities of our online test system.

In conclusion, our MCQ-based online test system is more than just a technology platform; it's a gateway to enhanced learning and self-improvement. We are committed to providing a seamless, efficient, and educational experience to all our users. As we move forward, we encourage you to keep learning, keep exploring, and keep pushing the boundaries of knowledge. Thank you for being a part of this educational journey, and we look forward to a future filled with continuous growth and success.

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