

ABSTRACT

The Online Examination System is a web-based application developed to streamline and automate the process of conducting examinations online. This project report provides a comprehensive overview of the Online Examination System, its objectives, design, implementation, and key features.

Traditional examination methods often involve manual paper-based processes, which can be time-consuming, error-prone, and inconvenient for both students and administrators. The Online Examination System aims to address these challenges by providing a user-friendly and efficient platform for conducting examinations.

The system allows administrators to create and manage exams, define question banks, set time limits, and assign exams to specific groups or individuals. Students can access the system using their unique login credentials, view their assigned exams, and submit their answers within the specified time frame. The system also includes features such as automated grading, result generation, and performance analytics.

The development of the Online Examination System involved the use of modern web technologies, including HTML, CSS, JavaScript, and PHP. The system was designed with a responsive and intuitive user interface to ensure usability across various devices and screen sizes.

Overall, the Online Examination System project report highlights the successful development and implementation of a web-based platform that revolutionizes the way examinations are conducted. The system's efficiency, ease of use, and advanced features make it a valuable tool for educational institutions and organizations seeking a modern and streamlined approach to conducting online examinations.

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CHAPTER 1

INTRODUCTION

INTRODUCTION

- OES (Online Examination System) is being launched because there is a need for a platform that is beneficial for both the University and the students. With this site, professors can register students and host online exams. Students can give exams and view their results. Hence, this website is an attempt to remove the existing flaws in the manual system of conducting exams.
- A web application that establishes a network between the University and the students. The professors can enter on the site the questions they want in the exam. These questions are displayed as a test to the eligible students. The answers entered by the students are then evaluated and their score is calculated and saved. This score can then be accessed by the institutes to determine the number of students that passed or failed and to evaluate their performance.

➤ **Objective:**

- The objectives of an Online Examination System website can vary depending on the specific needs and goals of the university or institution, but some common objectives include:

1. **Statement of the mission/goal of the organization:** This Web Application provides the University the opportunity to conduct examinations online. It saves time as it allows the number of students to give exams at a time when the professor makes it available and displays the results when the test gets over. There is no need to wait for the result as it is automatically generated by the server.

2. **Measurable Objectives for the proposed system:** In comparison to the present system the proposed system will be less time consuming and more efficient.

- Analysis will be very easy in proposed system as it is automated
- Result will be very precise and accurate and will be declared in a very short span of time because calculation and evaluations are done by the simulator itself.
- The proposed system is very secure as there are no chances of leakage of question paper as it is dependent on the administrator only.
- The logs of appeared candidates and their marks are stored and can be backup for future use

➤ **Purpose:**

- Responses by the candidate will be checked automatically and instantly
- Online examination will reduce the hectic job of assessing the answers given by the candidates.
- Being an integrated Online Examination System it will reduce the paper work.
- Can generate various reports almost instantly when and where required.

➤ **Scope:**

This Project would be useful for education institutions where regular evaluation of students' is required. Further it can also be useful for anyone who requires feedback based on objective type responses.

➤ **Existing System:**

- Content Management Systems (CMS): These systems allow for the creation and management of website content without the need for extensive coding knowledge. Popular CMS include WordPress, Drupal, and Joomla
- Server-side scripting languages: These languages allow for the creation of dynamic websites by generating HTML on the server-side, based on user requests. Examples of server-side scripting languages include PHP, Python, and Ruby.
- JavaScript frameworks: These are libraries of pre-written code that can be used to build complex dynamic websites. Examples of JavaScript frameworks include Angular, React.

➤ **Proposed System:**

Online examination systems have become increasingly popular and are widely used in educational institutions, certification bodies, and other organizations. The existing system of an online examination typically consists of several key components:

- User Registration: The system allows users, such as students or candidates, to create accounts by providing their personal details and credentials.
- Login and Authentication: Once registered, users can log in to the system using their username and password or other authentication methods like email verification, SMS verification.

- **Exam Creation and Management:** The system provides an interface for exam administrators to create and manage exams. They can define the exam structure, set the duration, assign question types (multiple-choice, essay, etc.), and specify the scoring criteria.
- **Question Bank Management:** The system allows administrators to create and manage a question bank that includes a variety of questions categorized by subjects or topics. This helps in generating random question sets for each exam.
- **Exam Scheduling:** Administrators can schedule exams, set start and end times, and define time limits for each exam. Students or candidates can view the schedule and select exams they want to participate in.
- **Exam Taking:** Students or candidates can access the exams during the scheduled time. The system presents the questions one by one, and users can submit their answers within the allotted time. The system may include features like saving answers, skipping questions, or marking questions for review.
- **Auto-Scoring and Result Generation:** For objective-type questions, the system can automatically evaluate the answers and generate scores instantly. For subjective-type questions, manual evaluation may be required. Once the evaluation is complete, the system generates the results and displays them to the users.
- **Performance Analytics:** The system provides detailed performance analytics to both administrators and users. It may include statistics on exam performance, individual question analysis, and comparison with other candidates, and progress tracking over time.
- **Security Measures:** Online examination systems incorporate various security measures to ensure the integrity and fairness of exams. These measures may include preventing cheating through measures like randomized question order, limiting access to external resources, and monitoring user activity.
- **System Administration:** The system includes an administrative panel for managing user accounts, exam configurations, question banks, and generating reports.

CHAPTER 2

REQUIREMENT ANALYSIS

REQUIREMENT ANALYSIS

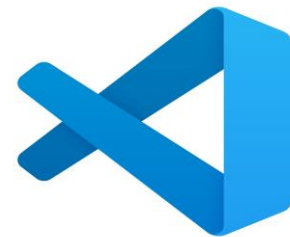
➤ **Problem definition:**

- In this section, we define problems. The problem is that, when results are to be declared, lot of money, physical space, man power is required. And there are so many candidates who needs to get their result, but due to medical illness or some emergency they are not able to visit the institute. Another problem is that, it depends on physical presence of the candidates to get their result.

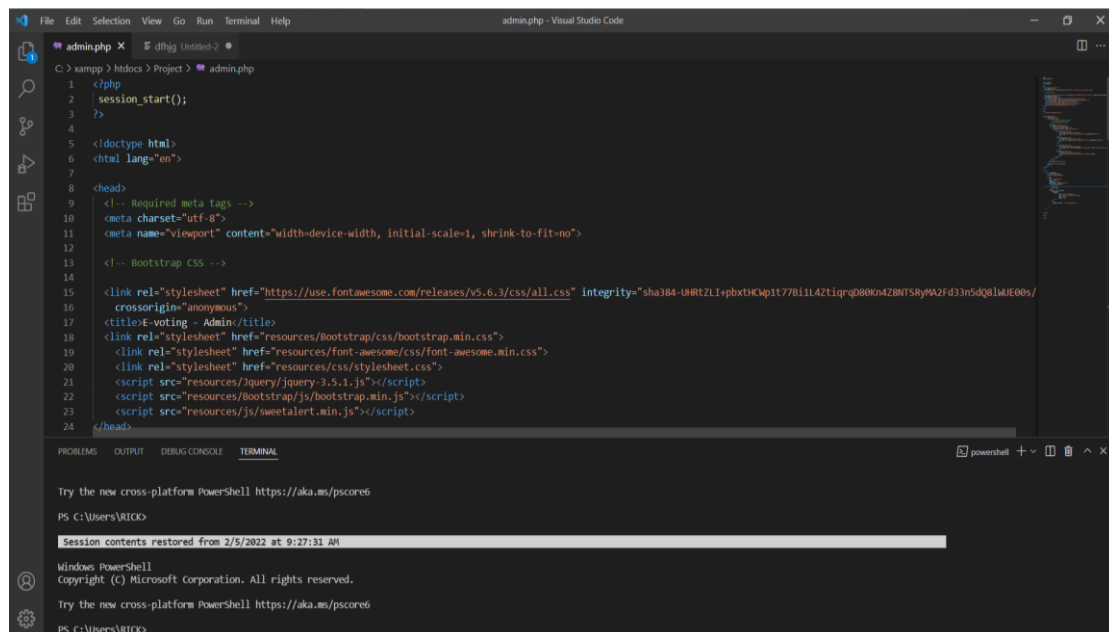
➤ **Applications requirements:**

1. Visual Studio Code:

- Visual Studio Code is an integrated development environment made by Microsoft for Windows, Linux and MACOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality. Microsoft has released most of Visual Studio Code's source code on GitHub under the permissive MIT License, while the releases by Microsoft are proprietary freeware.



- In the Stack Overflow 2021 Developer Survey, Visual Studio Code was ranked the most popular developer environment tool, with 70% of 82,000 respondents reporting that they use it. Visual Studio Code was first announced on April 29, 2015, by Microsoft at the 2015 Build conference. A preview build was released shortly thereafter. On November 18, 2015, the source of Visual Studio Code was released under the MIT License, and made available on GitHub. Extension support was also announced. On April 14, 2016, Visual Studio Code graduated from the public preview stage and was released to the Web.



2. XAMPP:

- The full form of XAMPP is (X) stands for Cross-platform, (A) Apache server, (M) Maria DB, (P) PHP and (P) Perl. XAMPP is an open source free software developed by Apache friends. XAMPP software package contains Apache distributions for Apache server, Maria DB, PHP, and Perl. And it is basically a local host or a local server. This local server works on your own desktop or laptop computer. You can just install this software on your laptop or desktop and test the clients or your website before uploading it to the remote web server or computer. This XAMPP server software gives you suitable environment for testing MYSQL, PHP, Apache and Perl projects on the local computer.
- The Cross-platform usually means that it can run on any computer with any operating system. Next Maria DB is the most famous database server and it is developed by MYSQL team. PHP usually provides a space for web development. PHP is a server-side scripting language. And the last Perl is a programming language and is used to develop a web application.

➤ Main Tools of XAMPP and its Definition:

- XAMPP contains tools such as Apache, MYSQL, PHP, and Perl. We will see these tools.

➤ Apache:

- Apache server is an open source free software which is initially developed by a group of software developers and now it is maintained by Apache software foundation. Apache HTTP is a remote server (computer) if someone request files, images or documents using their browser they will serve those files to clients using HTTP servers. Mainly hosting companies use this application to create a VPS server and shared hosting for their clients.

➤ **MYSQL:**

- MYSQL is open-source software. It is actually a relational database management system (RDBMS). This SQL stands for Structured Query Language. It is the most popular and best RDBMS used for developing a variety of web-based software applications. With the help of MYSQL, it is possible to organize the information, manage, retrieve and update the data whenever you wish to do.

➤ **PHP:**

The full form of PHP is Hypertext Preprocessor. It is a server-side scripting language that helps you to create dynamic websites. This language is mainly used to build web-based software applications. It is open-source software and works fine with MYSQL. What actually happens is, the PHP code will be executed on the server and at the browser side its HTML code will be displayed.

• **Programming Technology Requirements:**

HTML:

- HTML (Hyper Text Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content. Other technologies besides HTML are generally used to describe a web page's appearance/presentation (CSS) or functionality/behavior (JavaScript). "Hypertext" refers to links that connect web pages to one another, either within a single website or between websites. Links are a fundamental aspect of the Web. By uploading content to the Internet and linking it to pages created by other people, you become an active participant in the World Wide Web.
- HTML uses "markup" to annotate text, images, and other content for display in a Web browser. HTML markup includes special "elements" such as <head>, <title>, <body>, <header>, <footer>, <article>, <section>, <p>, <div>, , , <aside>, <audio>, <canvas>, <datalist>, <details>, <embed>, <nav>, <output>, <progress>, <video>, , , and many others.
- An HTML element is set off from other text in a document by "tags", which consist of the element name surrounded by "<" and ">". The name of an element inside a tag is case

insensitive. That is, it can be written in uppercase, lowercase, or a mixture. For example, the <title> tag can be written as <Title>, <TITLE>, or in any other way.

CSS:

- Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.
- CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file which reduces complexity and repetition in the structural content as well as enabling the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.
- Separation of formatting and content also makes it feasible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (via speech-based browser or screen reader), and on Braille based tactile devices. CSS also has rules for alternate formatting if the content is accessed on a mobile device.
- The name cascading comes from the specified priority scheme to determine which style rule applies if more than one rule matches a particular element. This cascading priority scheme is predictable.
- The CSS specifications are maintained by the World Wide Web Consortium (W3C). Internet media type (MIME type) text/css is registered for use with CSS by RFC 2318 (March 1998). The W3C operates a free CSS validation service for CSS documents. In addition to HTML, other markup languages support the use of CSS including XHTML, plain XML, SVG, and XUL.

JavaScript:

- JavaScript often abbreviated as JS, is a programming language that conforms to the ECMAScript specification. JavaScript is high-level, often just-in-time compiled, and multi-paradigm. It has curly bracket syntax, dynamic typing, prototype-based object orientation, and first-class functions.
- Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. JavaScript enables interactive web pages and is an essential part of web applications. The vast majority of websites use it for client side page behavior and all major web browsers have a dedicated JavaScript engine to execute it.
- As a multi-paradigm language, JavaScript supports event driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM). However, the language itself does not include any input/output (I/O), such as networking, storage, or graphics facilities, as the host environment (usually a web browser) provides those APIs.
- JavaScript engines were originally used only in web browsers, but they are now embedded in some servers, usually via Node.js. They are also embedded in a variety of applications created with frameworks such as Electron and Cordova.
- Although there are similarities between JavaScript and Java, including language name, syntax, and respective standard libraries, the two languages are distinct and differ greatly in design.

Bootstrap:

- Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains CSS- and (optionally) JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.
- Bootstrap is a web framework that focuses on simplifying the development of informative web pages (as opposed to web apps). The primary purpose of adding it to a web project is

to apply Bootstrap's choices of color, size, font and layout to that project. As such, the primary factor is whether the developers in charge find those choices to their liking. Once added to a project, Bootstrap provides basic style definitions for all HTML elements. The result is a uniform appearance for prose, tables and form elements across web browsers. In addition, developers can take advantage of CSS classes defined in Bootstrap to further customize the appearance of their contents. For example, Bootstrap has provisioned for light- and dark-colored tables, page headings, more prominent pull quotes, and text with a highlight.

- Bootstrap also comes with several JavaScript components in the form of jQuery plugins. They provide additional user interface elements such as dialog boxes, tooltips, and carousels. Each Bootstrap component consists of an HTML structure, CSS declarations, and in some cases accompanying JavaScript code. They also extend the functionality of some existing interface elements, including for example an autocomplete function for input fields.
- Example of a webpage using Bootstrap framework rendered in Firefox. The most prominent components of Bootstrap are its layout components, as they affect an entire web page. The basic layout component is called "Container", as every other element in the page is placed in it. Developers can choose between a fixed-width container and a fluid-width container. While the latter always fills the width of the web page, the former uses one of the four predefined fixed widths, depending on the size of the screen showing the page:
 - Smaller than 576 pixels
 - 576–768 pixels
 - 768–992 pixels
 - 992–1200 pixels
 - Larger than 1200 pixels
- Once a container is in place, other Bootstrap layout components implement a CSS Flexbox layout through defining rows and columns.
- A precompiled version of Bootstrap is available in the form of one CSS file and three JavaScript files that can be readily added to any project. The raw form of Bootstrap,

however, enables developers to implement further customization and size optimizations. This raw form is modular, meaning that the developer can remove unneeded components, apply a theme and modify the uncompiled Sass files.

jQuery:

- JQuery is a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax. [3] It –is free, open source software using the permissive MIT License. As of May 2019, jQuery is used by 73% of the 10 million most popular websites. Web analysis indicates that it is the most widely deployed JavaScript library by a large margin, having at least 3 to 4 times more usage than any other JavaScript library.
- JQuery's syntax is designed to make it easier to navigate a document, select DOM elements, create animations, handle events, and develop Ajax applications. jQuery also provides capabilities for developers to create plug-ins on top of the JavaScript library. This enables developers to create abstractions for low-level interaction and animation, advanced effects and high-level, them able widgets. The modular approach to the jQuery library allows the creation of powerful dynamic web pages and Web applications
- The set of jQuery core features—DOM element selections, traversal and manipulation—enabled by its selector engine (named "Sizzle" from v1.3), created a new "programming style", fusing algorithms and DOM data structures. This style influenced the architecture of other JavaScript frameworks like YUI v3 and Dojo, later stimulating the creation of the standard Selectors API. Later, this style has been enhanced with a deeper algorithm-data fusion in an heir of jQuery, the D3.js framework.
- Microsoft and Nokia bundle jQuery on their platforms. Microsoft includes it with Visual Studio for use within Microsoft's ASP.NET AJAX and ASP.NET MVC frameworks while Nokia has integrated it into the Web Run-Time widget development platform.

Ajax:

- Ajax is a set of web development techniques using many web technologies on the client side to create asynchronous web applications. With Ajax, web applications can send and retrieve data from a server asynchronously (in the background) without interfering with the display and behavior of the existing page. By decoupling the data interchange layer from

the presentation layer, Ajax allows web pages and, by extension, web applications, to change content dynamically without the need to reload the entire page.[3] In practice, modern implementations commonly utilize JSON instead of XML.

- Ajax is not a single technology, but rather a group of technologies. HTML and CSS can be used in combination to mark up and style information. The webpage can then be modified by JavaScript to dynamically display—and allow the user to interact with—the new information. The built-in XMLHttpRequest object, or since 2017 the new "fetch ()" function within JavaScript, is commonly used to execute Ajax on webpages, allowing websites to load content onto the screen without refreshing the page. Ajax is not a new technology, or different language, just existing technologies used in new ways.
- The term Ajax has come to represent a broad group of Web technologies that can be used to implement a Web application that communicates with a server in the background, without interfering with the current state of the page. In the article that coined the term Ajax,[1][3] Jesse James Garrett explained that the following technologies are incorporated:
 1. HTML (or XHTML) and CSS for presentation
 2. The Document Object Model (DOM) for dynamic display of and interaction with data
 3. JSON or XML for the interchange of data, and XSLT for XML manipulation
 4. The XMLHttpRequest object for asynchronous communication
 5. JavaScript to bring these technologies together
- Since then, however, there have been a number of developments in the technologies used in an Ajax application, and in the definition of the term Ajax itself. XML is no longer required for data interchange and, therefore, XSLT is no longer required for the manipulation of data. JavaScript Object Notation (JSON) is often used as an alternative format for data interchange, although other formats such as preformatted HTML or plain text can also be used. A variety of popular JavaScript libraries, including JQuery, include abstractions to assist in executing Ajax requests.

PHP:

- Hypertext Preprocessor is a server side scripting language— designed for web development and also used as a general-purpose programming language. It was originally created by

Ramus Leadoff in 1994. The PHP reference is now produced by the PHP group. PHP originally stood for personal home page. But now it stands for recursive initialism PHP hypertext preprocessor.

- PHP code may be embedded into html code. It can be used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a common gateway interface executable. The web server combines the results of interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP code may also be executed with a command line interface and can be used to implement standalone graphical applications.
- The standard PHP interpreter, powered by the Zend engine, is free software released under the PHP license. PHP has been widely ported and can be deployed on most web servers on almost every operating system and platform, free of charge.
- The PHP language evolved without a written formal specification or standard until 2014, with the original implementation acting as the de facto standard.

What is a PHP File?

- PHP files can contain text, HTML, CSS, JavaScript, and PHP code.
- PHP code are executed on the server, and the result is returned to the browser as plain HTML.
- PHP files have extension ".PHP".

What Can PHP Do?

- PHP can generate dynamic page content
- PHP can create, open, read, write, delete, and close files on the server
- PHP can collect form data
- PHP can send and receive cookies
- PHP can add, delete, modify data in your database
- PHP can be used to control user-access

- PHP can encrypt data
- With PHP you are not limited to output HTML. You can output images, PDF files, and even flash movies. You can also output any text, such as XHTML and XML.

Why PHP?

- PHP runs on various platforms (Windows, Linux, UNIX, Mac OS X, etc.)
- PHP is compatible with almost all servers used today (Apache, IIS, etc.)
- PHP supports a wide range of databases
- PHP is free. Download it from the official PHP resource: www.PHP.net
- PHP is easy to learn and runs efficiently on the server side
- PHP is an amazing and popular language!
- It is powerful enough to be at the core of the biggest blogging system on the web (WordPress)!
- It is deep enough to run the largest social network (Facebook)!
- It is also easy enough to be a beginner's first server-side language!

Advantages of PHP:

The reason behind the popularity of PHP is its several advantages. PHP is most suited for the purpose of web development. The advantages of PHP are discussed briefly below:

1. Cross Platform:

- All the PHP based applications can run on various types of platforms. PHP is supported by majority of Operating Systems, some of which includes Solaris, UNIX, Windows and Linux. The mentioned platforms can be used to write codes in PHP and also view web pages or run the PHP based applications.
- PHP easily interfaces with MySQL and Apache both. An effortless integration of PHP can be done with various other technologies like Java and there is no requirement of redevelopment. Therefore, saving both time and money, giving it an important advantage.

2. Easy database connection:

- A programming language like PHP is widely used on the internet and needs to connect to the database very often. Therefore, having a feature that could help PHP to connect to database easily is mandatory. Several websites such as the ecommerce websites require good database management system.
- PHP has a built-in module that helps it in connecting with database easily. Therefore, PHP has a great demand in the field of web development where a data driven website needs to be developed. PHP significantly reduces the time needed in developing the web application that needs an efficient database management system.

3. Easy to use:

- PHP is widely used because it is easy to use. In contrast with other programming languages that are complex, PHP is simple, fluent, clean and organized; hence it is a boon for the new users. PHP has a well-organized syntax which is logical at the same time.
- PHP does not require any intensive studying or manual to use it. Command functions of PHP are easily understood as the user can easily figure out from the name of the commands itself what it does. A person who is new to PHP can still code because the syntax is somewhat similar to C.
- A person who is new to PHP can still code because the syntax is somewhat similar to C. Hence, if a person who knows C can easily code in PHP. Hence, it is easier to create and optimize the application using PHP.

4. Speed:

- Speed is the primary need of web development. There are people who face the challenge of slow internet connection and slow data speed. Furthermore, a fast-loading website is always preferred by people across the globe. When compared to other programming languages, PHP is found to be the fastest programming language.
- In normal circumstances, it takes a lot of time to connect to the database, when you attempt to fetch certain data from the database. It takes a lot of time in connecting to the database, then executing the statement and finally getting the data. PHP performs these set

of tasks faster than other scripting languages. PHP is faster in both connecting to the database and in using other important applications.

- The high speed of PHP gives it an advantage over other scripting languages and gives it an application in important administrations such as the server administration and mail functionalities.

5. Open source:

- One of the important advantages of PHP is that it is Open-Source. Therefore, PHP is readily available and is entirely free. In contrast to other scripting languages used for web development which requires the user to pay for the support files, PHP is open to everyone, anytime and anywhere.
- A beginner in PHP need not worry about the support as PHP is maintained and developed by a large group of PHP developers which helps in creating support community of PHP that helps people in PHP implementation and manipulation.

- **System minimum requirements:**

Hardware System Configuration: -

- Processor - Dual Core/ Pentium/ i3 Intel Processor
- RAM - 2 GB
- Hard Disk - 512MB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse

Software System Configuration: -

- Operating System - Windows XP/7/8/10
- Server-side Script – PHP
- Database - MySQL 6.0

Research Methodology:

- A research methodology is the elaboration of a clear strategy for gathering evidence, including the specific data collection methods to be used, the kinds of evidence to be collected, and the approach for analyzing the evidence (Darian-Smith & McCarthy, 2017). It is the path to solve a research problem. Hence it must be planned according to the objectives of the study.

Data Analysis:

- The classification and tabulation transfer the raw data collected into useful information by organizing and compiling the bits of data into graphically understandable manner, and in the current research it was done with the help of a UML (Unified Modelling Language) modelling tool.

System Analysis:

- Systems development is mainly done in two phases namely, system analysis and design. And this chapter focuses on analyzing the research data and describing a logical view of the whole process, by modelling the data analyzed in the form of diagrams to visualize the design and specifications of the system in an object-oriented manner. The analysis phase answers the questions of who will use the system, what the system will do, and where and when it will be used. During this phase, the research team investigates any current system(s), identifies opportunities for improvement, and develops a concept for the new system.

System Design:

- The purpose of the analysis phase is to figure out what the business needs and right after system analysis, started system design whose purpose is to decide how to build the same system. And according to Dennis et al system design is the determination of the overall system architecture consisting of a set of physical processing components, hardware, software, people, and the communication among them, that will satisfy the system's essential requirements. During the initial part of design, the business requirements for the system are converted into system requirements that describe the technical details for building the system.

CHAPTER 3

MODULES

MODULE

The entire project mainly consists of three modules:

1. Log In
 - ✓ Admin Login
 - ✓ Faculties Login
 - ✓ Student Login
2. Add faculties
 - ✓ Admin Access to Faculties
3. User Profile
 - ✓ All users have separate one
4. Manage Student Group
 - ✓ Both Admin & Faculties have the access
5. Student Registration
 - ✓ Invite Only by the Faculties only
6. Manage Test
 - ✓ Both Admin & Faculties have the access
7. Result Generation
8. Logout

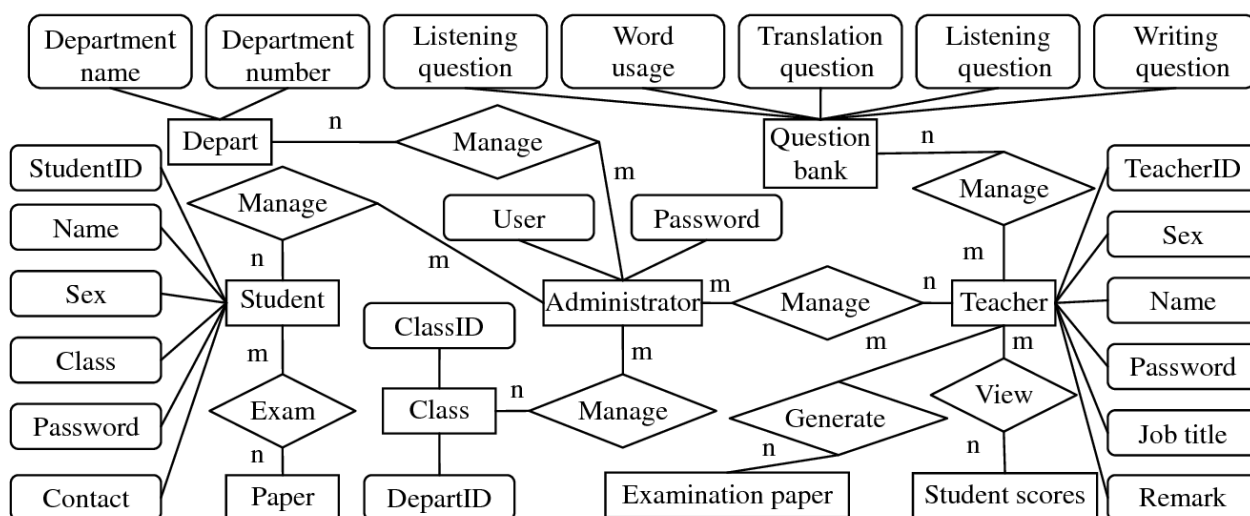
CHAPTER 4

ER- DIAGRAM

Entity Relationship Diagram:

- An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how “entities” such as people, objects or concepts relate to each other within a system. ER Diagrams are most often used to design or debug relational databases in the fields of software engineering, business information systems, education and research. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals and connecting lines to depict the interconnectedness of entities, relationships and their attributes. They mirror grammatical structure, with entities as nouns and relationships as verbs.
- ER diagrams are related to data structure diagrams (DSDs), which focus on the relationships of elements within entities instead of relationships between entities themselves. ER diagrams also are often used in conjunction with data flow diagrams (DFDs), which map out the flow of information for processes or systems.

ER- DIAGRAM



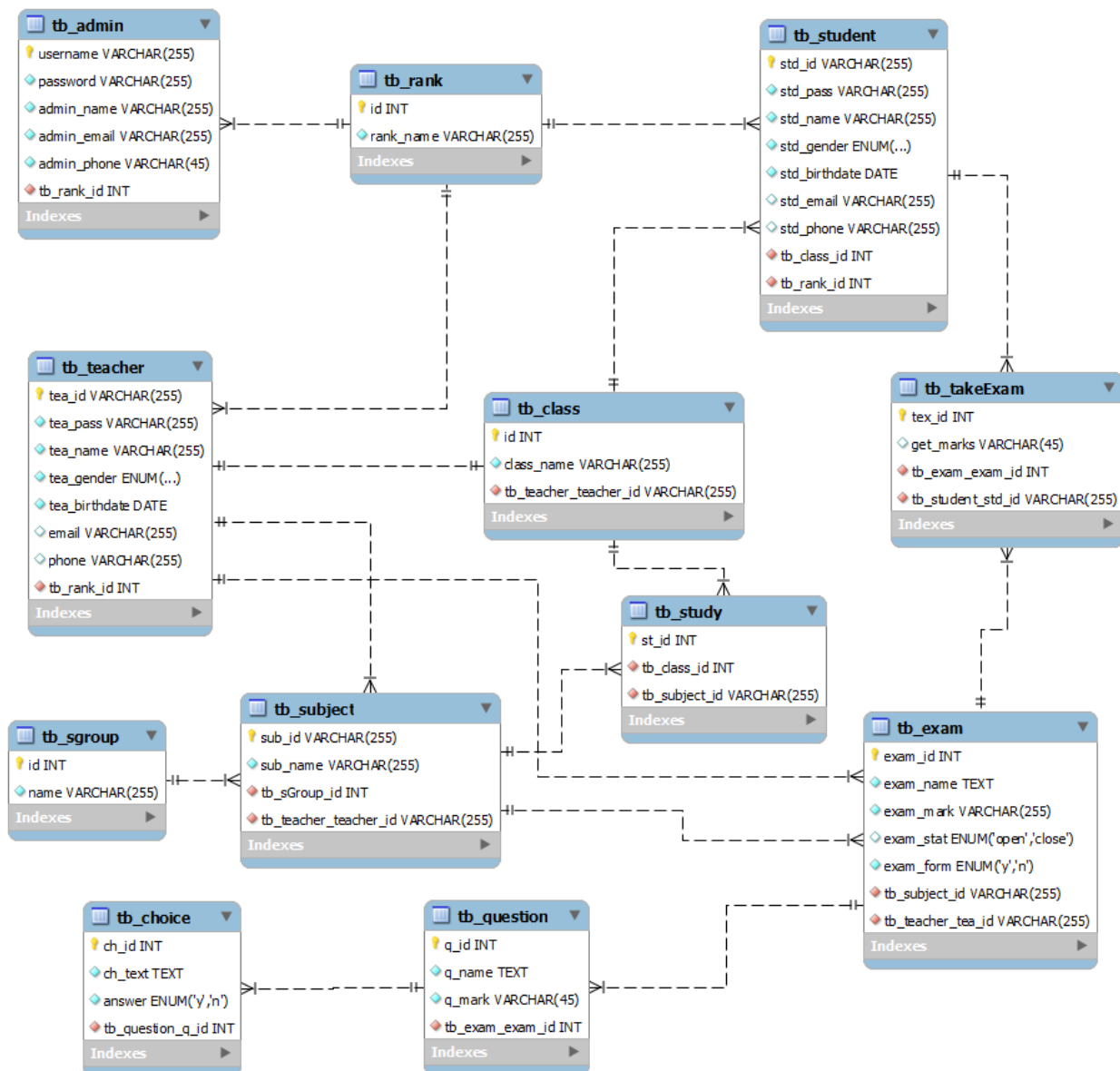
CHAPTER 5

DATABASE DESIGN

Database Design:

- From the analysis phase, a logical model of the system was created. And the following particular activity describes the proposed system's data organization, storage and management. Which is to be managed by the DBMS a system responsible for storing, retrieving and protecting the data. These issues are important as they affect the consistency and quality of the data. The data is structured in files or tables that interact in various ways. Each table contains data about students, professors, users and subjects. According to Dennis, relational database is the most popular kind of database for application development today. And it is based on collections of tables with each table having a primary key, which is a field or fields whose values are unique for every row of the table and are used to identify each row or record. The tables are related to one another by placing the primary key from one table into the related table as a foreign key. Most relational database management systems (RDBMS) support referential integrity, or the idea of ensuring that values linking the tables together through the primary and foreign keys are valid and correctly synchronized.

• Design



CHAPTER 6

CODING

SAMPLE CODE

Index:

```
<?php
define(
    "ENVIRONMENT",
    isset($_SERVER["CI_ENV"]) ? $_SERVER["CI_ENV"] : "development"
);
switch (ENVIRONMENT) {
    case "development":
        error_reporting(-1);
        ini_set("display_errors", 1);
        break;
    case "testing":
    case "production":
        ini_set("display_errors", 0);
        if (version_compare(PHP_VERSION, "5.3", ">=")) {
            error_reporting(
                E_ALL &
                ~E_NOTICE &
                ~E_DEPRECATED &
                ~E_STRICT &
                ~E_USER_NOTICE &
                ~E_USER_DEPRECATED
            );
        } else {
            error_reporting(E_ALL & ~E_NOTICE & ~E_STRICT & ~E_USER_NOTICE);
        }
        break;
    default:
        header("HTTP/1.1 503 Service Unavailable.", true, 503);
        echo "The application environment is not set correctly.";
        exit(1); // EXIT_ERROR
}
$system_path = "system";
```

```

$application_folder = "application";
$view_folder = "";
// Set the current directory correctly for CLI requests
if (defined("STDIN")) {
    chdir(dirname(__FILE__));
}
if (($_temp = realpath($system_path)) !== false) {
    $system_path = $_temp . DIRECTORY_SEPARATOR;
} else {
    // Ensure there's a trailing slash
    $system_path =
        strtr(
            rtrim($system_path, "\\"),
            "\\",
            DIRECTORY_SEPARATOR . DIRECTORY_SEPARATOR
        ) . DIRECTORY_SEPARATOR;
}
// Is the system path correct?
if (!is_dir($system_path)) {
    header("HTTP/1.1 503 Service Unavailable.", true, 503);
    echo "Your system folder path does not appear to be set correctly. Please open the following file and
correct this: " .
        pathinfo(__FILE__, PATHINFO_BASENAME);
    exit(3); // EXIT_CONFIG
}
/*
 * -----
 * Now that we know the path, set the main path constants
 * -----
 */
// The name of THIS file
define("SELF", pathinfo(__FILE__, PATHINFO_BASENAME));
// Path to the system directory
define("BASEPATH", $system_path);
// Path to the front controller (this file) directory
define("FCPATH", dirname(__FILE__) . DIRECTORY_SEPARATOR);
// Name of the "system" directory

```

```
define("SYSDIR", basename(BASEPATH));
// The path to the "application" directory
if (is_dir($application_folder)) {
    if (($_temp = realpath($application_folder)) !== false) {
        $application_folder = $_temp;
    } else {
        $application_folder = strtr(
            rtrim($application_folder, "\\"),
            "\\",
            DIRECTORY_SEPARATOR . DIRECTORY_SEPARATOR
        );
    }
} elseif (is_dir(BASEPATH . $application_folder . DIRECTORY_SEPARATOR)) {
    $application_folder =
        BASEPATH .
        strtr(
            trim($application_folder, "\\"),
            "\\",
            DIRECTORY_SEPARATOR . DIRECTORY_SEPARATOR
        );
} else {
    header("HTTP/1.1 503 Service Unavailable.", true, 503);
    echo "Your application folder path does not appear to be set correctly. Please open the following file and
correct this: " .
        self;
    exit(3); // EXIT_CONFIG
}
define("APPPATH", $application_folder . DIRECTORY_SEPARATOR);
// The path to the "views" directory
if (
    !isset($view_folder[0]) &&
    is_dir(APPPATH . "views" . DIRECTORY_SEPARATOR)
) {
    $view_folder = APPPATH . "views";
} elseif (is_dir($view_folder)) {
    if (($_temp = realpath($view_folder)) !== false) {
        $view_folder = $_temp;
```



```
} else {
    $view_folder = strtr(
        rtrim($view_folder, "\\"),
        "\\ ",
        DIRECTORY_SEPARATOR . DIRECTORY_SEPARATOR
    );
}
} elseif (is_dir(APPPATH . $view_folder . DIRECTORY_SEPARATOR)) {
    $view_folder =
        APPPATH .
        strtr(
            trim($view_folder, "\\ "),
            "\\ ",
            DIRECTORY_SEPARATOR . DIRECTORY_SEPARATOR
        );
} else {
    header("HTTP/1.1 503 Service Unavailable.", true, 503);
    echo "Your view folder path does not appear to be set correctly. Please open the following file and
correct this: " .
        self;
    exit(3); // EXIT_CONFIG
}
define("VIEWPATH", $view_folder . DIRECTORY_SEPARATOR);
require_once BASEPATH . "core/CodeIgniter.php";
```

CHAPTER 7

TESTING

TESTING

Software Testing:

Software Testing is a method to check whether the actual software product matches expected requirements and to ensure that software product is Defect free. It involves execution of software/system components using manual or automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements.

Software Testing is Important because if there are any bugs or errors in the software, it can be identified early and can be solved before delivery of the software product. Properly tested software product ensures reliability, security and high performance which further results in time saving, cost effectiveness and customer satisfaction.

Alpha Testing:

Alpha testing is a type of testing that is done on an application towards the end of a development process when the product is almost in a usable state. This type of testing does not involve functional testing on the application. Instead, it is a user testing on the application in order to understand the user behavior and experience on the application. Normally this test is performed by test engineers, employees and sometimes friends / family members with the aim of trying to emulate around 80% of the customers. While these users test and give their feedback, the development team observes the behavior to check for design issues in the application. Alpha testing is mainly conducted to unveil bugs that might arise due to abrupt errors created by the users, validate the quality state of the software in minimal time and finally propound a build that procures the specifications required. Once this test is executed properly, the software is ready for the next stage, i.e., the beta test. Alpha testing has two phases.

Black Box Testing:

Black box testing refers to any type of software test that examines an application without knowledge of the internal design, structure, or implementation of the software project. Black box testing can be performed at multiple levels, including unit testing, integration testing, system testing, or acceptance testing.

I. Unit Testing: -

- Unit testing is essentially for the verification of the code produced during the coding phase and the goal is test the internal logic of the module/program. In the Generic code project, the unit testing is done during coding phase of data entry forms whether the functions are working properly or not. In this phase all the drivers are tested they are rightly connected or not.

II. Integration Testing: -

- All the tested modules are combined into sub systems, which are then tested. The goal is to see if the modules are properly integrated, and the emphasis being on the testing interfaces between the modules. In the generic code integration testing is done mainly on table creation module and insertion module.

VALIDATION TESTING

- This testing concentrates on confirming that the software is error-free in all respects. All the specified validations are verified and the software is subjected to hard-core testing. It also aims at determining the degree of deviation that exists in the software designed from the specification; they are listed out and are corrected.

SYSTEM TESTING

- This testing is a series of different tests whose primary is to fully exercise the computer-based system.
- This involves, implementing the system in a simulated production environment and testing it.

White Box Testing:

White Box Testing is software testing technique in which internal structure, design and coding of software are tested to verify flow of input-output and to improve design, usability and security. In white box testing, code is visible to testers so it is also called Clear box testing, open box testing, transparent box testing, Code-based testing and Glass box testing.

Beta Testing:

Beta testing is one of the final steps in your software development lifecycle (SDLC) before a product goes live. Also referred to as user testing or customer validation, beta testing aims to ensure that end users are satisfied with a software product before you make it generally available (GA). While beta tests want to catch any software bugs and errors that have snuck through the testing process, it is more about understanding and improving the product's full end user experience before it becomes GA. That means thoroughly investigating the experience flow and understanding any pain points that will hinder enjoyment of the experience for your end user.

Positive Test Cases:

- The positive flow of the functionality must be considered
- Valid inputs must be used for testing
- Must have the positive perception to verify whether the requirements are justified.

Negative Test Cases:

- Must have negative perception
- Invalid inputs must be used for test.

Feasibility Study:

- The next step in analysis is to verify the feasibility of the proposed system. "All projects are feasible given unlimited resources and infinite time ". But in reality, both resources and time are scarce. Project should confirm to time bounce and should be optimal in their consumption of resources. This place a constant is approval of any project.

- Feasibility has applied to the following areas:

Technical feasibility

Operational feasibility

Economic feasibility

TECHNICAL FEASIBILITY:

- To determine whether the proposed system is technically feasible, we should take into consideration the technical issues involved behind the system.

OPERATIONAL FEASIBILITY:

- To determine the operational feasibility of the system we should take into consideration the awareness level of the users. This system is operational feasible since the users are familiar with the technologies and hence there is no need to gear up the personnel to use system. Also, the system is very friendly and to use.

ECONOMIC FEASIBILITY:

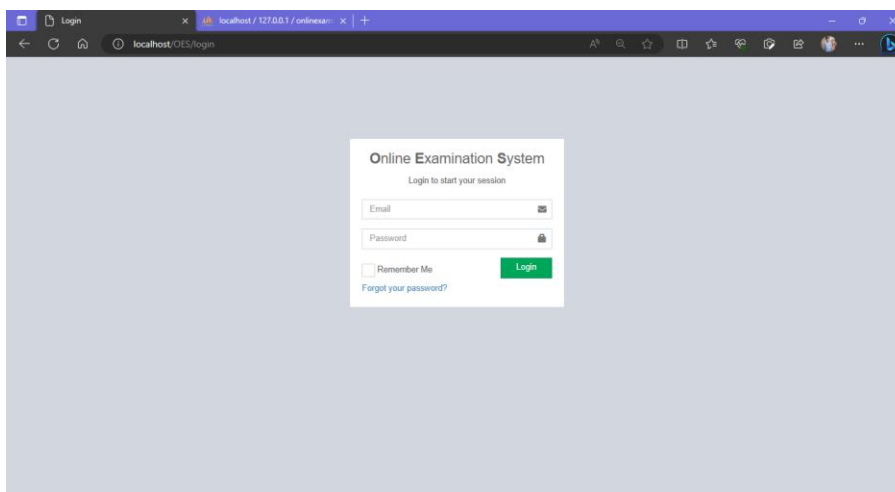
To decide whether a project is economically feasible, we have to consider various factors as:

- Cost benefit analysis
- Long-term returns
- Maintenance costs

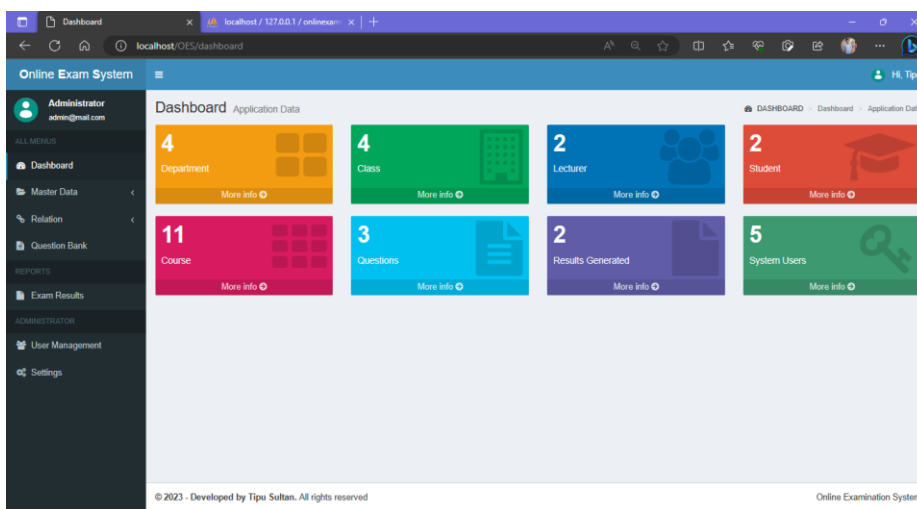
CHAPTER 8

SCREENSHOTS

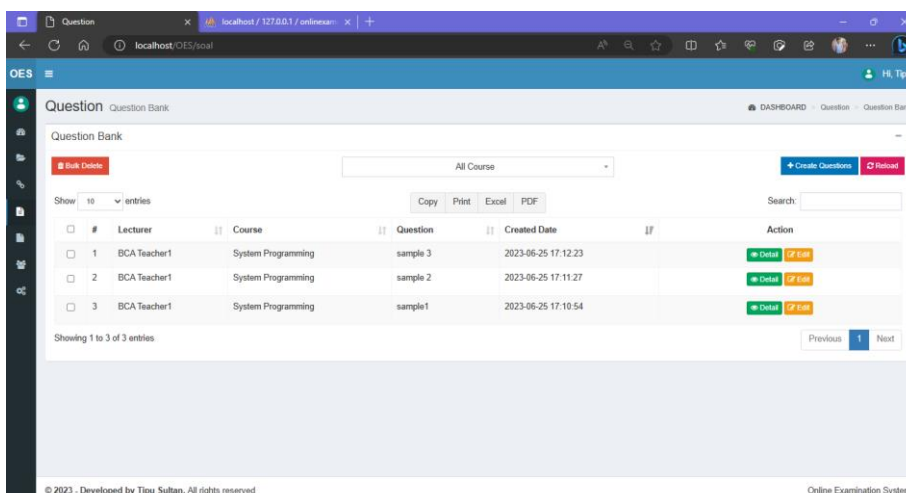
Login Page:



Admin Dashboard:



Question Bank Page (ADMIN):



User Management Page (ADMIN):

User Management User Data

Master User Data

Reload Show me

Show 10 entries

#	First Name	Last Name	Username	Email	Level	Created On	Status	Action
1	BCA	Teacher2	00000002	bcat2@mail.com	Lecturer	2023-06-25 17:08:33	Active	Edit Delete
2	BCA	Teacher1	00000001	bcat1@mail.com	Lecturer	2023-06-25 17:08:30	Active	Edit Delete
3	sb1		10000001	s1@mail.com	Student	2023-06-25 17:15:35	Active	Edit Delete
4	sb2	sb2	10000002	s2@mail.com	Student	2023-06-25 17:40:18	Active	Edit Delete

Showing 1 to 4 of 4 entries

Previous 1 Next

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Online Examination System

Student Dashboard:

Dashboard Application Data

Account Information

NIM: 10000001

Name: sb1

Gender: Female

Email: s1@mail.com

Department: BCA

Class: BCA-6th

Before You Kick Off

Welcome to Online Examination System. Here are some tips in order to get you through the system with an ease.

- First things first, all the examinations are listed on the "Exam Section (left hand sidebar menu)".
- Secondly, you'll only be able to see the examinations according to your course-department.
- Every examination has its own time limit, which is set by the lecturer.
- You're required to enter the TOKEN number in order to start the online examination.
- You need to enter/start examination within the given time frame (date and time) ELSE you can't join the examination.
- Once you complete your exams, you'll ONLY be able to view your results.
- For re-exam, please consult with your respective lecturer!

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Online Examination System

Exam Page (Student):

Exam List Exam

Class: BCA-6th

Department: BCA

Date: Monday, 17 July 2023

Hour: 12:48:24

List Exam

Reload Show me

Show 10 entries

#	Exam Name	Course	Lecturer	Number of Questions	Time	Action
1	Exam 1	System Programming	BCA Teacher1	3	2023-06-25 17:15:46 (2 Minute)	Print Results

Showing 1 to 1 of 1 entries

Previous 1 Next

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Online Examination System

Teacher's Dashboard:

Online Exam System

Dashboard Application Data

Account Information

Name	BCA Teacher1
NIP	00000001
Email	bcat1@gmail.com
Course	System Programming
Class List	1. BCA-6th 2. Forensic

Before You Kick Off:

Welcome to Online Examination System. Here are some tips in order to get you through the system with an ease.

- First things first, all the Questions are listed on the "Question Bank section (left hand sidebar menu)"
- Secondly, you can manage questionnaires in order to setup examinations from Question Bank section
- Every examination should have its own name, question sets, date and timing details set by LECTURER.
- You need to copy and share (to students) the TOKEN code, once after creating the Examination record.
- Once student completes their examination, you'll be able to view their detailed results from "Exam Results" section.
- Also, the result portion can be downloaded on PDF format.

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Question Bank Page (Teacher's):

Online Exam System

Question Question Bank

Question Bank

System Programming

Actions: Bulk Delete, Create Questions, Reload

Show: 10 entries

Copy Print Excel PDF

Search:

#	Lecturer	Course	Question	Created Date	Action
1	BCA Teacher1	System Programming	sample 3	2023-06-25 17:12:23	Detail Edit
2	BCA Teacher1	System Programming	sample 2	2023-06-25 17:11:27	Detail Edit
3	BCA Teacher1	System Programming	sample1	2023-06-25 17:10:54	Detail Edit

Showing 1 to 3 of 3 entries

Previous 1 Next

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Exam Result Page (Teacher):

Online Exam System

Exam Exam results

Exam results

Actions: Reload

Show: 10 entries

Copy Print Excel PDF

Search:

#	Exam	Course	Lecturer	Total Ques.	Time	Date	Action
1	Exam 1	System Programming	BCA Teacher1	3	2 Minute	2023-06-25 17:15:46	View Results

Showing 1 to 1 of 1 entries

Previous 1 Next

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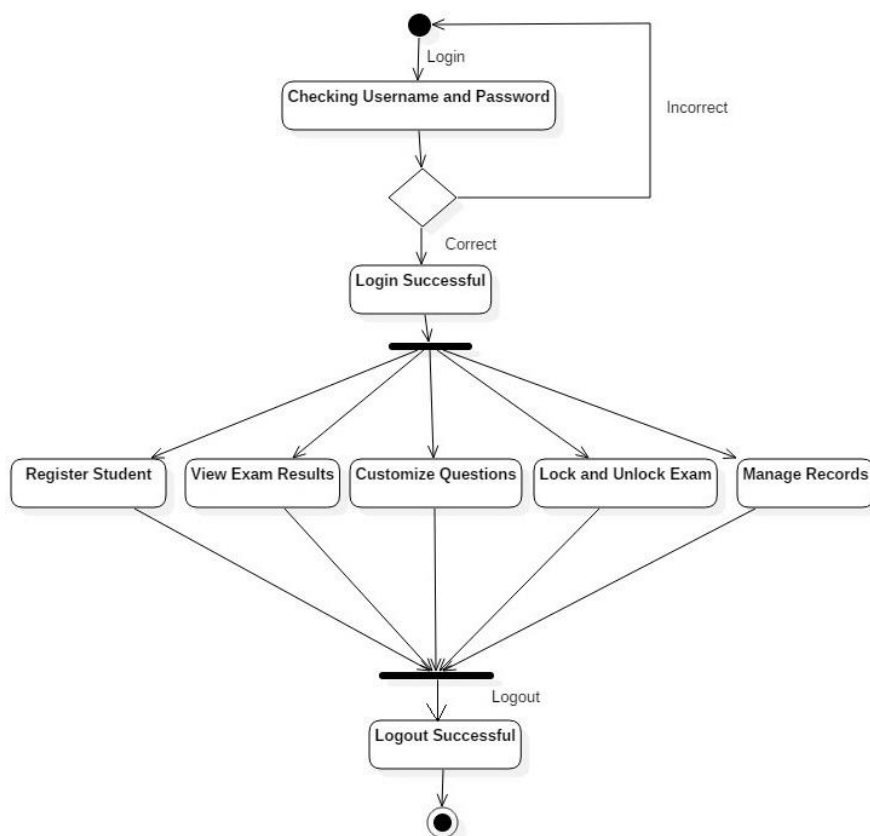
CHAPTER 9

ANALYSIS AND DESIGN

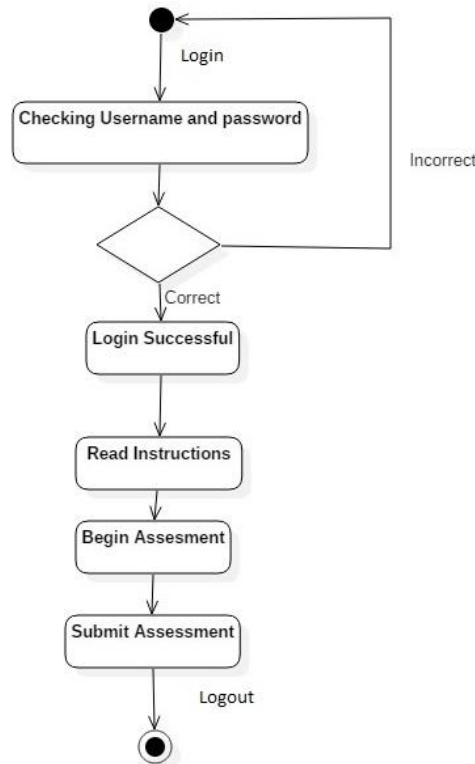
Use Case Diagram:



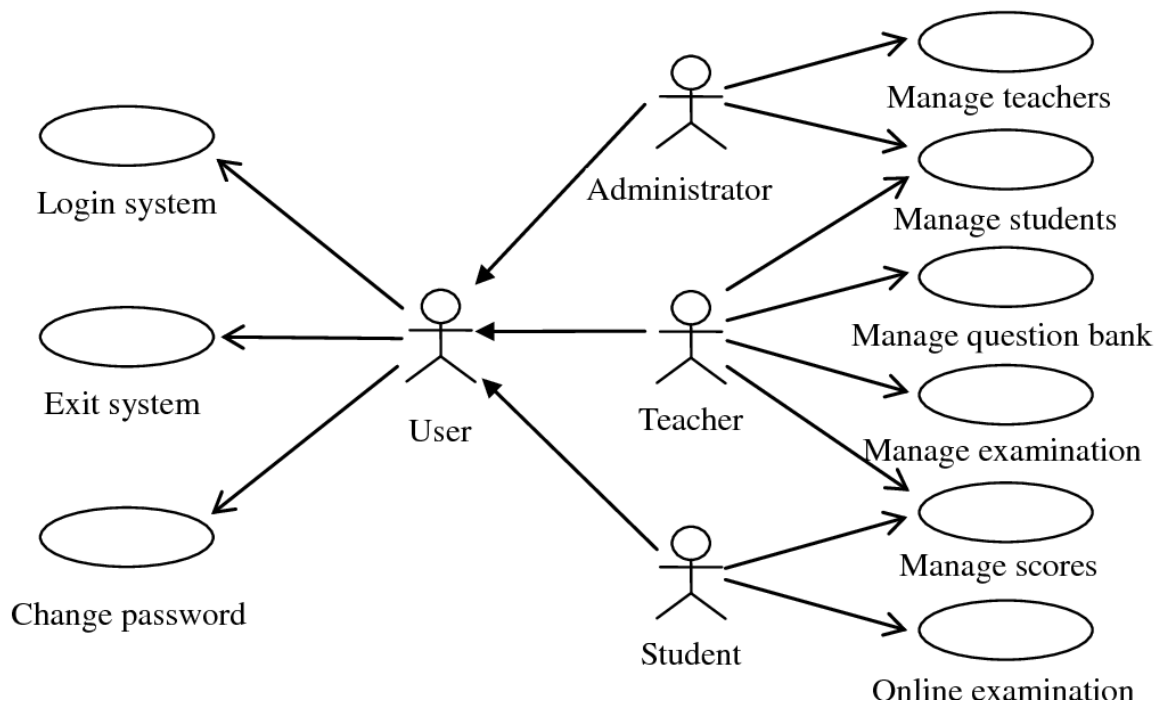
Activity Diagram (ADMIN):



Activity Diagram (Student):



Data Flow Analysis:



CHAPTER 10

CONCLUSION

CONCLUSION

The development and implementation of an **Online Examination System (OES)** have proven to be a significant step forward in the field of education and assessment. This project aimed to provide a seamless and efficient platform for conducting exams remotely, offering numerous advantages over traditional pen-and-paper exams.

Throughout the project, several key objectives were successfully achieved. Firstly, the online examination system ensured greater accessibility for both students and instructors. It eliminated the need for physical presence, allowing students to take exams from any location with an internet connection.

Secondly, the system enhanced the efficiency and accuracy of the examination process. The automated grading system reduced the burden on instructors, minimizing human error and ensuring fair evaluation. The online platform also facilitated quick and convenient result generation, enabling timely feedback for students.

Furthermore, the project demonstrated the benefits of utilizing technology in education. By embracing online examinations, educational institutions can leverage digital tools to streamline administrative tasks, reduce paper usage, and enhance the overall learning experience. However, it is important to acknowledge that the implementation of an online examination system is not without its challenges.

In conclusion, the online examination system project has successfully revolutionized the examination process by providing a flexible, efficient, and secure platform for assessment. It has opened up new opportunities for remote learning, improved accessibility, and empowered educators with advanced tools for evaluation. As technology continues to advance, the online examination system will play an increasingly vital role in the future of education.

CHAPTER 11

FUTURE ENHANCEMENT

FUTURE ENHANCEMENT

In the future, there are several potential enhancements that can be implemented in an online examination system to improve its functionality, user experience, and security. Here are some ideas:

- **Remote Proctoring:** Implement advanced remote proctoring techniques to ensure the integrity of the examination process. This can include features such as facial recognition, AI-based behavior analysis, and screen monitoring to detect any suspicious activities during the exam.
- **Biometric Authentication:** Integrate biometric authentication methods such as fingerprint or iris scanning to ensure the identity of the test taker and prevent impersonation.
- **AI-based Automated Grading:** Utilize artificial intelligence and machine learning algorithms to automate the grading process for objective questions. This can significantly reduce the time and effort required by instructors in evaluating exams.
- **Adaptive Testing:** Implement adaptive testing techniques where the difficulty level of the questions adjusts based on the student's performance. This personalized approach ensures that each student is challenged appropriately and provides a more accurate assessment of their knowledge.
- **Virtual Reality (VR) Exams:** Incorporate virtual reality technology to create immersive exam environments, particularly for subjects that require practical or hands-on assessments. VR simulations can provide a more realistic testing experience.
- **6. Collaboration Tools:** Integrate collaborative features that allow students to work together on group projects or assignments. This can include real-time document editing, video conferencing, and shared whiteboards.
- **Enhanced Analytics and Reporting:** Provide comprehensive analytics and reporting capabilities for instructors, allowing them to analyze student performance, identify areas of improvement, and generate detailed reports for individual students or the entire class.
- **Mobile Accessibility:** Develop mobile applications or responsive web interfaces that allow students to take exams on their smartphones or tablets, providing flexibility and convenience.

- **Integration with Learning Management Systems (LMS):** Seamlessly integrate the online examination system with popular Learning Management Systems, enabling streamlined management of courses, assessments, and student data.
- **Blockchain Technology:** Implement of blockchain technology to ensure the security, immutability, and transparency of exam results and certifications. This can help prevent fraud and maintain the integrity of the certification process. Remember, these are just some possibilities for future enhancements. The actual implementation will depend on technological advancements and the specific needs of the educational institutions or organizations using the online examination system.

CHAPTER 12

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BIBLIOGRAPHY

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