Automated System For Issuance & Dispatch Of Educational Documents

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BALOCHISTAN UNIVERSITY OF INFORMATION TECHNOLOGY, ENGINEERING, AND MANAGEMENT SCIENCES

Spring 2024

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A project report submitted to the

Department of Software Engineering

in partial fulfillment of requirements for the degree of Bachelor of Science in Computer Engineering at Balochistan University of Information Technology, Engineering and Management Sciences

Spring 2024

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Signature of Co-Supervisor (If any): _____

Signature of FYP Coordinator: _____

Undertaking

It is certified that this work titled "AUTOMATED SYSTEM FOR ISSUANCE & DISPATCH OF EDUCATIONAL DOCUMENTS" is our own work. The work has not been presented elsewhere for assessment. Where material has been used from other sources it has been properly acknowledged / referred to.

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Acknowledgements

I would be grateful to everyone who helped me accomplish my thesis on the 'Automated System for Issuance & Dispatch of Educational Documents.' First of all, I would like to extend from the core of my heart my gratitude to Dr. Bakhtiar Kasi and Engr. Muhammad Akram, whose wise counseling, insightful criticism, and unflinching support did make very important contributions toward completion of this study.

I also owe huge appreciation to BUITEMS for providing me with the necessary equipment and creating a very friendly environment for working. Last but not least, we convey our thanks to the administrative and technical staff for helping in this project and offering us some useful ideas and technical support.

The final word is for each and every one who has helped realize the academic endeavors in any way by sharing knowledge, time, and effort.

Dedication

My thesis is dedicated to my family, friends, and mentors who have constantly inspired me with their continuous support and encouragement since the beginning of my journey. It is their faith in me that has enabled this task to be completed in a successful manner.

	Balochistan University of Information Technology, Engineering and Management Sciences, Quetta
BUITEMS	*Quality & Excellence in Education*

Final Year Project Intellectual Property Form, FICT

Project Title: Automated System For Issuance & Dispatch Of Educational Documents

Date: 19 / 07 / 2024

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Declaration

I agree that the information related to the project titled Automated System For Issuance & Dispatch Of Educational Documents under the supervision of Dr. Bakhtiar Khan Kasi will be kept confidential. This includes:

1. All the technical and scientific data relating to project discussions, research, design and simulation, processes, and business and/or marketing plans that are developed or are under development.
2. This information will be disclosed solely to individuals who have a signed non-disclosure agreement with, or who have express approval from **Dr. Bakhtiar Khan Kasi** and **Dr Shah Marjan**, in written, to receive this information.

Understood and agreed on the 19th day of July in 2024.

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Abstract

The “Automated System for Issuance and Dispatch of Educational Documents” is intended to smooth out the most common way of creating, confirming, and appropriating declarations, certificates, records, and other educational records. This inventive arrangement intends to supplant conventional manual strategies with a fully automated, proficient, and secure framework. The system guarantees the authenticity and integrity of educational documents by utilizing cutting-edge technologies.

The framework is made out of a few key parts including document management module, a confirmation and check motor, a UI for understudies and heads, and a joining layer for connecting with existing instructive organization information bases. The document management module handles the creation, storage, and retrieval of documents, while the validation module confirms the authenticity of these records. The integration layer ensures seamless connectivity with existing systems, providing a user-friendly platform for document requests and receipts.

Not only does this system make educational documents more accurate and efficient, but it also significantly lowers the likelihood of fraud. By automating the system, educational institutions can guarantee ideal and precise dispatch of documents..

Keywords: Automated System, Educational Documents, Verification, Document Management, Digital Signatures, Fraud Prevention.

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Chapter No. 1

1 INTRODUCTION

1.1 Background

In the area of education, the issuing and sending of official documents, including diplomas, transcripts, and certificates, are considered a very important process. These records are considered proof of academic success and are also very crucial for learners on their way to continuing with further studies or looking for job opportunities. In most cases, the process of issuing and sending these documents has been manual, time-consuming, and prone to errors. Problems that educational institutions face include verifying document authenticity, fraud prevention, and on-time delivery to the recipient.

The importance of smoothing this cycle out has grown increasingly evident with the implementation of digitalization in education. Automated systems provide a solution to many of these challenges, the current ones included, by offering secure, efficient, and scalable ways of handling educational documents.

The problems exist in the erroneous dispatch of educational documents and are a potential source of fraud. “The Automated System for Issuance and Dispatch of Educational Documents” should thereby cover all those problems with a broad solution that enhances the document cycle with improved accuracy, safety, and efficiency in managing it. Automating core parts of the cycle and using current innovations like computerized marks and encryption will ensure issuance and dispatching of educational documents in a firm and sealed way.

1.2 Problem Statement

The current manual cycle of requesting and delivering academic documents is inefficient, bottlenecked, and inaccurate. Most of the educational institutions get so burdened by handling the deluge of requests for documents that they suffer serious delays and high administration. For instance, students have to wait for several weeks to get back their transcripts or certificates, thus putting in peril their career in further studies or professions. Apart from this, there is a very high percentage of error and mishandling in manual handling, which has a direct impact on the accuracy and integrity of the fundamental educational record. There is an immense need for an "Automated System for Issuance and Dispatch of Educational Documents" to make the process smooth by minimizing errors and providing better services in this sector.

1.3 Objective

The purpose of this FYDP is the development of an “Automated System for Issuance and Dispatch of Educational Documents” in a more effective, accurate, and secure manner. This will help in automating the entire process from a request to dispatch, with the complete minimization of manual intervention and errors. We list down our objectives into these SMART goals:

Specific:

• Develop and implement an automated system for managing the issuance and dispatch of learning documents, including transcripts, diplomas, and certificates.

• This will facilitate the integration of the system with the existing student information systems.

Measurable:

• Provide a 50% reduction in the issuance and dispatch turnaround time within the first six months of implementation.

• Ensure that the contents of the documents issued are accurate to 99% by eliminating manual data input errors.

Achievable:

• Conduct thorough testing and validation phases to ensure the system operates correctly and meets all specified requirements.

Relevant:

• Address existing inefficiencies in manual processing of educational documents, leading to delays and errors.

• Enhancing user experience for learners and admins to guarantee a dependable, user-friendly system.

Time-bound:

• Complete system design and start implementation within six months.

• Pilot test it and make any necessary modifications within three months.

• Fully deploy the system and provide training to administrative staff within one year.

Contribution to Addressing the Identified Problem

By achieving the aforementioned goals, the automated system will reduce the work in earnest by administrative personnel, minimize the possibility of making errors in papers issued, and hasten the whole process. This will result in increased satisfaction among students and other stakeholders; educational institutions will give information in a timely manner and precisely documented. The advanced security features will ensure that the sensitive information is safe and protected, therefore minimizing the chances for fraud or unauthorized access.

1.4 Scope

This project is aimed at designing and implementing an "Automated System for Issuance and Dispatch of Educational Documents". The primary objective is to streamline the process of generating, verifying, and delivering various academic certificates, transcripts, and diplomas.

Boundaries and Limitations

Boundaries: The system will be limited to dealing with educational documents managed within an academic institution.

Limitation: It will not handle non-educational documents; it will not integrate into external academic institutions either.

Specific Components Covered

Verification and Document Request: The system will have a module where students requesting documents can verify such documents with the admin responsible for verification.

Document Generation: Automatically created, standardized educational documents, based on verified information.

Dispatch Mechanism: Enable dispatch through both the email delivery mechanism and postal service.

User Administration: Role-based access control on students, alumni, and administrative staff.

Tracking and Notifications: Real-time tracking of the status of the document together with automated notifications to stakeholders.

Constraints

Regulatory Compliance: The system must provide compliance with educational regulatory and data privacy laws.

Budgetary Constraints: The budget is limited; thus, the use of some technologies may be restricted or implemented in a phased manner.

Technical constraints: integration with the existing institutional systems and databases, ensuring compatibility and security.

Resource Constraints: Availability of technical staff and administrative personnel to develop and maintain the system.

By clear demarcation of the boundaries, components, and constraints, this project shall confine itself to delivering a solid and efficient "Automated System for Issuance and Dispatch of Educational Documents" within the specified scope.

1.5 Significance of the Study/ Mapping FYP with Sustainable Development Goals (SDGs)

Potential Impact and Benefits

An automated system to issue and send educational papers is going to make huge paradigm shifts in how the administration processes are carried out within educational institutions. The project hereby aims at streamlining the creation, validation, and delivery of crucial documents such as diplomas, certificates, and transcripts. This system purports to enhance productivity, reduce errors, and cut down on time and human-processing resources by the automation of such operations.

Contributions to the Field, Industry, and Society

Field

It delivers a strong solution to a common problem in education administration: document management. This automated system can be deployed as a model for the implementation of similar technology in other institutions.

Industry

The tech industry has its importance, which the project brings out the relevance of automation and digitization in education to the IT sector, but more so to firms specializing in education technology. It may foster greater creativity and further research on how to produce safe, efficient, and user-friendly educational materials.

Society

On a societal front, this system could do a great deal for teachers and administrators as well as for students. The improved speed of access to student records should greatly benefit students as they apply for jobs or further study. Meanwhile, the reduction in administrative tasks and workloads will directly benefit teachers and support staff by providing them more time to focus on their core responsibilities towards education.

Potential Stakeholders and Beneficiaries

Educational Institutions: It makes document management more efficient and accurate.

Students: Easy access to important academic documents in a fast and reliable way.

Administrative Staff: Reduced workload and burden of administrative work.

Employers and Other Educational Institutions: Better verification process for academic credentials.

EdTech Industry: New frontiers of automation application in the educational setup.

Alignment with the United Nations' Sustainable Development Goals

This project is aligned with some of the United Nations' Sustainable Development Goals, furnishing a comprehensive platform to address not only some of the global challenges but also to advance sustainable development.

SDG 4: Quality Education:

The project would directly support SDG 4 on inclusive and equitable quality education and promote lifelong learning opportunities. This will ensure high standards in the administration of education, with enhanced efficiency and reliability in document management.

SDG 9: Industry, Innovation, and Infrastructure:

An automated system facilitates the development and use of resilient infrastructure; it promotes inclusive and sustainable industrialization while fostering innovation. The automated system presented how advanced technology is utilized in the education sector.

SDG 16: Peace, Justice, and Strong Institutions:

In a nutshell, this project will achieve the 16th SDG through increased transparency and accountability in institutions. Automated issuance and dispatch of documents provide students with more integral and reliable educational records, free from fraud and errors.

Conclusion: An 'Automated System for Issuance and Dispatch of Educational Documents' is an innovation in the educational administration domain. It has been established that technology can be revolutionary toward gaining sustainability; it does not just add to increased operational efficiency but adds to a broader goal of societal benefit by aligning with a few key SDGs.

1.6 Organization of the Thesis

This thesis is organized into five chapters, each contributing to the comprehensive understanding and development of the automated system for issuance and dispatch of educational documents.

Chapter 1: Introduction

The first chapter presents the problem statement, the goals of the project, and justification for developing "Automated System for Issuance and Dispatch of Educational Documents". That is done by relating to the current problems experienced with manual systems and the benefits expected from automation.

Chapter 2: Literature Review

The second chapter would cover the details of the body of research available. This includes a comparison of other automated systems with the one being proposed and an investigation into the approaches and technology currently being used in document issuance and dispatch. This chapter will give the theoretical underpinning for the presented system, besides also identifying any existing gap in literature that may exist.

Chapter 3: Methodology

The third chapter describes the approach pursued for designing the automated system. It further elaborates on the design process, the technology and tools used, and an outline of the orderly steps that were followed. This chapter also includes the system architecture and workflow diagrams, which are vital in the understanding of how the system works.

Chapter 4: Development and Testing / Result and Discussion

Chapter 4 describes the development and implementation of the project. It further elaborates on each implementation process, starting from coding through system integration to testing. At the end, the results from the tests are reported, and issues related to the system functionality or reliability, along with problems, are discussed. This chapter shows how the system realizes the objectives stated in the introduction.

Chapter 5: Conclusion and Future Work

The last chapter summarizes the overall conclusion of the thesis and the influence such an automated system might have. Successes and failures of the project are discussed, and further advice is provided concerning the research. This chapter gives a clear view of the improvements and additions that can be done to enhance the usefulness and effectiveness of the system.

Chapter No. 2

2 LITERATURE REVIEW

Purpose and Significance of the Literature Review

The objective of the literature review is to make the readers understand the status of research and development in the area of the "Automated System for Issuance and Dispatch of Educational Documents." This review brings together findings from various journal articles, books, conference proceedings, and research papers published over the last five years to ensure that the most recent and pertinent developments are brought into focus.

This literature review is important to locate the project within the bigger academic and technological framework. It would therefore throw light on best practices, point to potential obstacles, and identify gaps in current knowledge through the analysis of past research and progress. Furthermore, it should give insight into the technology and methods used in the past which were either successful or not.

Contribution to the Project

Literature review from the existing systems would act as a guide to the project: "Automated System for Issuance and Dispatch of Educational Documents". The successes and failures of past systems will facilitate this project in the copying of success strategies and the circumvention of other common pitfalls. It will also assist in the development of research questions and objectives since this study would ensure they are founded on knowledge available presently and valid in the real world.

Secondly, this literature review justifies the importance and need for the project. The review will serve to validate the objectives of the project, showing that it could make a contribution in educational administration as a result of an ongoing evolution and interest in the field.

Addressing Research Questions and Objectives

The work will relate to the questions that the research pursues and its objectives by:

Identifying Key Themes and Trends: Analyze recent papers to identify the primary themes, trends, and technological advances in automatic educational document systems.

Assess Methodologies: Evaluate methodologies used in previous studies to determine their efficacy and their applicability for the current project.

Highlight Best Practices: Extract best practices of successful implementations for guiding the development process of the system.

Recognizing Challenges: To acknowledge and understand the challenges and limitations faced by the earlier systems to develop robust solutions.

Establishing Theoretical Framework: Build a theoretical framework that supports the design and implementation phases of the project.

In effect, this literature review will form a very basic building block within the Thesis, which serves some incredibly crucial viewpoints and direction that is necessary for the formulation of an industrious and successful the "Automated System for Issuance and Dispatch of Educational Documents".

In the research conducted by Jones et al. (2018), they focused on processing time for diplomas and transcripts run using an automated system. Their findings were that processing time fell from 10 days to just 2 days under an automated system. This system furthered the automation of data entry and verification and, as such, increased accuracy and eliminated errors. [1]

This paper describes the challenges to data security and privacy in the use of automated educational document management systems. The authors talk about existing legal and regulatory frameworks for data privacy in education and put forward recommendations for any institution that decides to implement such automated systems. [2]

This case study will evaluate the implementation of automated dispatch and issuance of educational documents at one university in Oman. They are pointing to the advantages in the process of automation: reduction in the time of processing, improvement of accuracy, and enhancement of student service satisfaction. [3]

This literature review provides a comprehensive overview of the research on automated systems for issuing educational documents. The review summarizes the benefits of automation, identifies challenges in implementation, and suggests areas for future research. [4]

This paper proposes a framework for designing an automated system for dispatching and issuing educational documents. The framework outlines the components, functionalities, and security considerations for such a system. [5]

2.1 Review of Similar Applications

This chapter critically compiles what has already been researched, applied, studied, and initiated concerning the automated issue and distribution of documents. The strengths and weaknesses of earlier approaches and methodologies are therefore identified in light of the key themes, trends, and gaps in contemporary literature. The purpose of the review is to outline as much information on the current situation as is possible and therefore to develop a more adequate automatic system for handling educational documents.

Summary

The literature review on “Automated System for Issuance and Dispatch of Educational Documents” uncovers a few vital discoveries and experiences. It, first and foremost, features the developing significance and reception of computerized arrangements in educational organization to upgrade productivity, accuracy, and security. Key advantages recognized include reduced handling times, minimization of human mistakes, and further developed availability for stakeholders.

However, the review additionally uncovers gaps in the current research, especially in the areas of system integration, user experience, and information protection concerns. There is a requirement for additional examination on the most proficient method to consistently coordinate these automated frameworks with existing educational foundation and guarantee they are easy to understand for different groups of users, including students, staff, and outside entities. Furthermore, the survey stresses the need for hearty information assurance measures to defend sensitive educational records.

The bits of knowledge acquired from the literature have fundamentally educated the advancement regarding this project. They have directed the selection of appropriate technologies, guaranteeing the system addresses the recognized gaps and use the prescribed procedures from existing exploration. The project methodology consolidates an emphasis on user driven plan, comprehensive system integration, and severe information security conventions, expecting to make a successful and solid “Automated System for Issuance and Dispatch of Educational Documents”.

Chapter No. 3

3 METHODOLOGY

This section gives a thorough outline of the methodology and techniques utilized to foster an "Automated System for Issuance and Dispatch of Educational Documents". The motivation behind this part is to clarify the means taken to address the problem statement and test the underlying hypothesis.

Problem statement highlights shortcomings and delays related with conventional manual cycles in educational institutions for issuing and dispatching significant documents like transcripts, diplomas, and certificates. These delays often result in inconvenience for students and administrative staff, as well as potential setbacks in academic and professional pursuits.

In addressing the said problem, this followed a systematic approach of integrating software development, business process automation, and user-centered design principles in order to design a more orderly issuance and dispatch of documents; hence, reducing human errors and generally improving efficiency. The following sections give details on the research design, data collection methods, stages of design and development of the system, testing procedures, and evaluation criteria.

3.1 System Features

1. User Authentication and Authorization

Description: This feature guarantees that the system is only accessed by authorized personnel with secure login credentials.

Relevance: It helps to ensure that unauthorized entry into the system does not arise and that important documents, such as those for education, are not accessed by some unwarranted user.

Contribution: Ensures data integrity and security in a manner that confidentiality is kept on a high for students' records.

2. Document Template Management

Description: Software enabling administrators to create, edit, and manage templates used for a wide variety of educational documents.

Significance: This ensures that documents are prepared with consistency and coherence.

Contribution: This is why development of educational documents is very easy to come up with, hence maintaining efficiency in time and accuracy.

3. Automated Document Generation

Description: Automatically creates educational documents, using predefined models and input data.

Relevance: Quickens the process of issuance and reduces manual intervention.

Contribution: Increases effectiveness and accuracy, ensuring timely delivery of documents.

4. Document Tracking and History

Description: Documentation issuance and dispatch tracking with history log maintenance.

Relevance: Provides traceability and accountability for the issued documents.

Contribution: Enhanced transparency and easy tracking of document status.

5. Notification System

Description: Sends notifications to the user and stakeholders (students, administrators) from which the document issued/ dispatched status can be checked.

Relevance: Keeps all parties informed about the progress and completion of document processing.

Contribution: Improves communication and ensures that recipients are promptly notified.

6. Bulk Processing Capability

Description: It allows batch processing of several documents at once.

Relevance: This is important in the handling of documents with a large volume.

Contribution: It promotes productivity with short times for document issuance.

7. Reporting and Analytics

Description: Generates all sorts of reports and analytics about the issuance of documents and dispatching the same.

Relevance: Facilitates the generation of comprehension regarding system performance and areas that require improvement.

Contribution: Helps in the decision-making process and optimization of the document-issuing process.

8. Data Import and Export

Description: Supports importing and exporting data from various formats for seamless integration with other systems.

Relevance: Such functionalities would contribute to the area of rendering data handy and ensuring interoperability with external systems.

Contribution: It ensures that data can be conveniently exchanged while providing flexibility through seamless integration with other systems.

9. Secure Data Storage

Description: It is a repository for all the documents of education and related data.

Relevance: It is relevant in terms of protection against breaches and loss of data.

Contribution: This contribution from this unit is to guarantee integrity and confidentiality in the preservation of the given data in accordance with data protection rules.

10. User-Friendly Interface

Description: User interface is interactive and user-friendly for technical experts or beginners.

Relevance: This will ensure that the user can work with a system without much hassle, not going through a protracted training session.

Contribution: This all amounts to a more complete user experience and easier adoption to ensure faster processing of educational documents.

3.2 Project Planning

GANTT CHART:

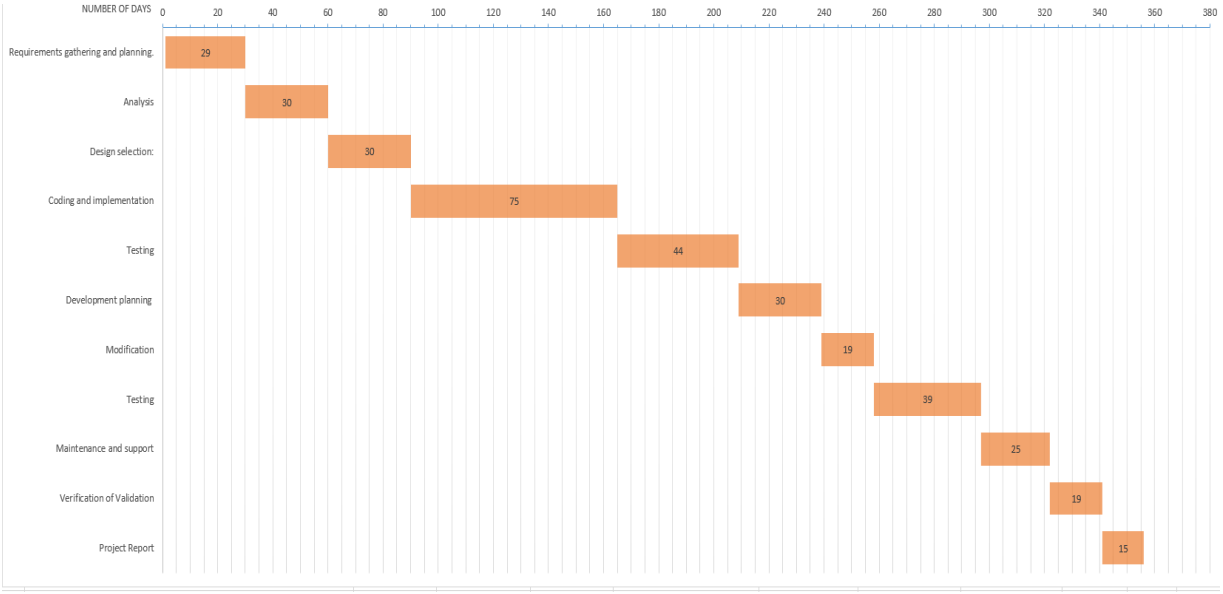


Figure 1: Gantt Chart

DESCRIPTION:

This is a Gantt chart, which is a widely used project management tool for visualizing job relationships and timelines.

Below is an explanation of the data displayed in the chart:

Tasks:

The project's many tasks are listed on the left side of the chart, and they include:

- Requirements gathering and planning
- Analysis
- Design selection
- Coding and implementation
- Testing
- Development planning
- Modification
- Maintenance and support
- Verification of validation
- Project report

Timeline:

The chronology, shown by the chart's horizontal axis, is expressed in days. The given image does not show the precise scale, although it looks to go from 0 to about 380 days.

Duration:

Each horizontal bar's length represents how long the related job will take. For instance, the expected duration of "Coding and implementation" is 75 days.

Duration:

The length of each horizontal bar represents how long the related task took. For instance, the expected duration of "Coding and implementation" is 75 days.

Dependencies:

The bars' positions on the timeline indicate the relationships between the tasks. If one bar appears before another, it probably means that the previous job has to be finished. For instance, "Coding and implementation" must be completed before "Testing" may start.

Overall Project Timeline:

The chart shows the anticipated timetable for the project as a whole. The project's expected completion time of 380 days is based on the dependencies and durations of its activities.

Extra Information:

- It's possible that the colour of the bars represents various project phases or priorities.
- Each job may have further details attached to it, such as the resources needed.

3.3 Project Design

3.3.1 Diagrams

ENTITY RELATIONSHIP DIAGRAM:

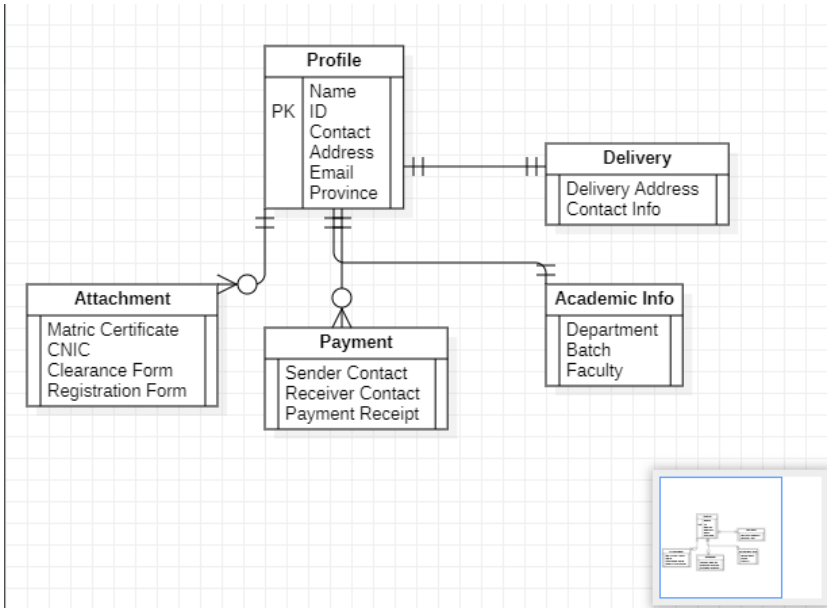


Figure 2: Entity Relationship

DESCRIPTION:

This conceptual data model, or more precisely an Entity-Relationship (ER) diagram, shows how a database for "Automated System for Issuance and Dispatch of Educational Documents".

Entities:

The primary data items in the system are represented by a number of entities in the diagram. These things are:

- **Profile:** Saves personal data about people, such as name, ID, phone number, address, email, and province.
- **Delivery:** Provides information regarding shipments, including contact details and the delivery address.
- **Attachment:** Denotes a variety of profile-related documents, including registration forms, CNICs, clearance forms, and matriculation certificates.
- **Payment:** Holds data pertaining to payments, such as payment receipts and the contact information of the sender and recipient.
- **Academic Details:** Provides details about a person's academic background, including department, batch, and teacher.

Relationships:

The relationships between the entities are shown by the lines that connect them. These connections show the nature of the links between the entities.

- **Profile-to-Delivery:** A one-to-many relationship in which a profile may be connected to more than one delivery.
- **Profile-to-Attachment:** A profile might have more than one attachment connected to it. This is known as a profile-to-many relationship.
- **Profile-to-Payment:** This is a one-to-many relationship in which a profile may be connected to more than one payment.
- **Profile-to-Academic Info:** This relationship is one-to-one, meaning that only one set of academic data can be linked to a profile.

Qualities:

The particular data components that will be kept in the associated database table are represented by the attributes found within each entity. The Profile entity, for instance, contains the following attributes: Name, ID, Contact, Address, Email, and Province.

Cardinality:

The maximum number of instances of one entity that can be associated to a single instance of another entity is indicated by the cardinality of a connection. The majority of relationships in the diagram have one-to-many cardinality, which means that while a profile may contain several deliveries, attachments, or payments, a single delivery, attachment, or payment may only be connected to a single profile. A profile can only contain one set of academic data, though, because the relationship between the two is one-to-one.

FLOW CHART DIAGRAM:

USER INTERFACE **ADMIN INTERFACE**

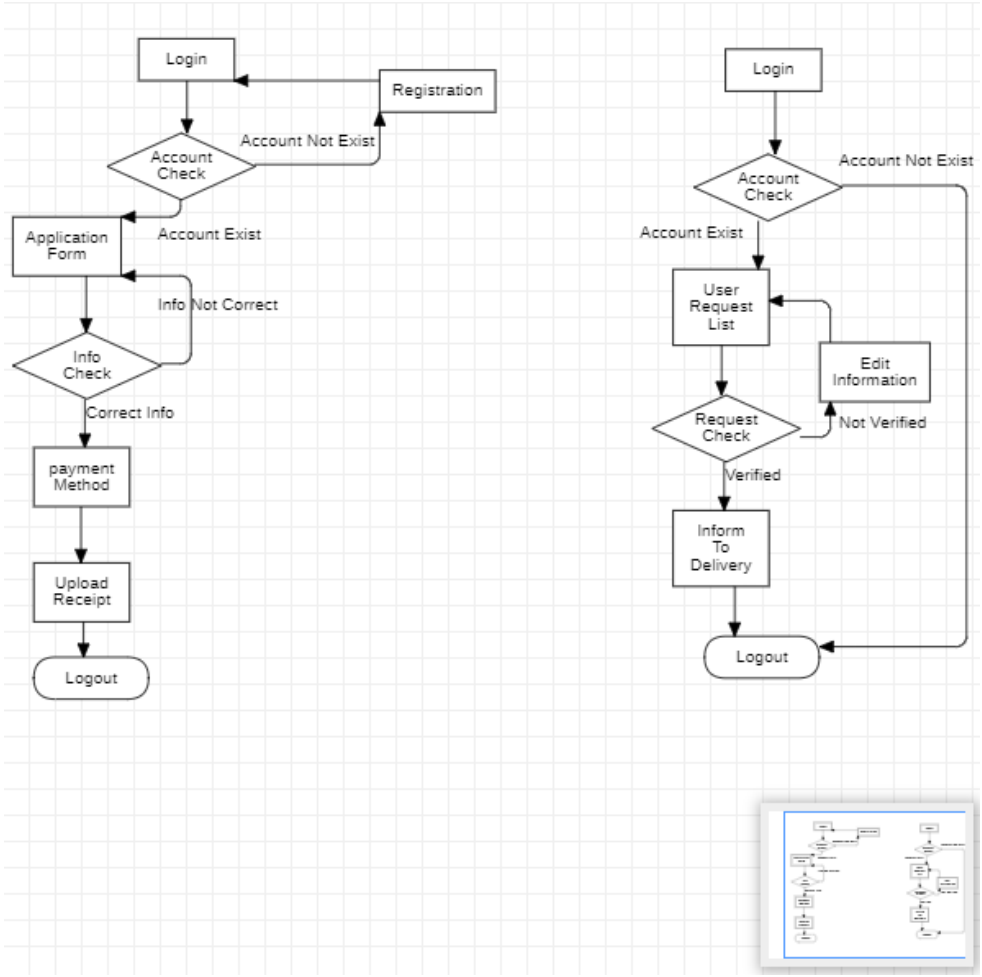


Figure 3: Use Case

DESCRIPTION:

The "Automated System for Issuance and Dispatch of Educational Documents" user flow is shown in this flowchart. It describes the many stages and choices a user would have to make when using the system.

Below is an explanation of the flowchart:

Sign-in or Register:

- The two initial branches of the flowchart are "Login" and "Registration."
- The user gets the option to log in if they already have an account.
- They can sign up to make an account if they don't already have one.

Verify Account:

- There is a "Account Check" stage to confirm the account's existence for both login and registration.
- The system moves on to the next phase if the account is present.
- The user receives an error notice or is sent to registration page if account is not found.

Application Document:

- User is sent to Application Form where they provide required data if account is active.

Information Verification:

- Next, the system verifies that the data it has received is accurate.
- The procedure continues if the data is accurate.
- The user is prompted to update any inaccurate information.

Method of Payment:

- User is prompted to choose a payment option after the information has been validated.

Upload the receipt:

- The user could be required to provide a payment receipt as evidence of payment after choosing their payment option.

Notify Delivery:

- The system notifies delivery team about order as soon as the payment is successful.

Log out:

- The user can now exit the system by logging out.

Extra Information:

- Decision points (diamonds) in flowcharts represent places where the system makes decisions in response to input from the user or supplied data.
- Operations or processes carried out by system are represented by rectangular boxes.
- Process flow is indicated by arrows.

CLASS DIAGRAM:

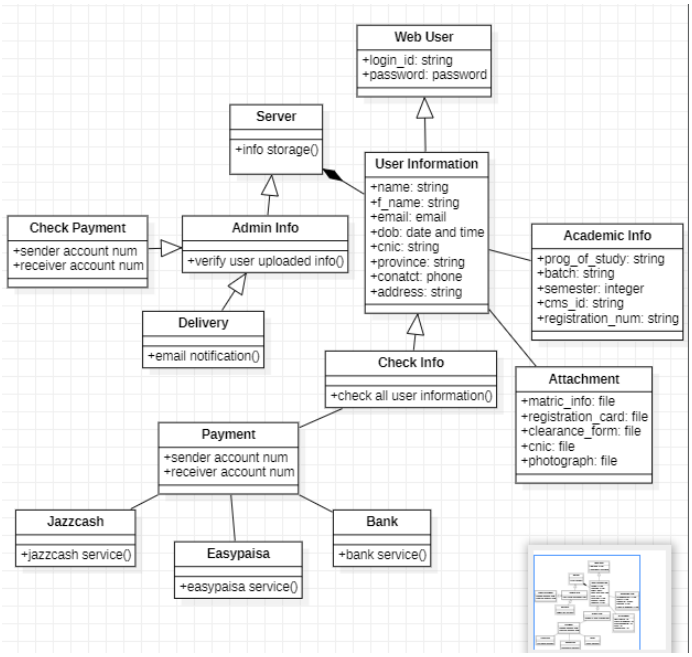


Figure 4: Class Diagram

DESCRIPTION:

This is a class diagram, which shows a software system's structure visually. It displays classes, along with their characteristics and connections.

The class diagram is broken out as follows:

Classes:

- **Web User:** Contains information of system's users(name, password, and login ID).
- **Server:** Stands for the server that manages the logic and data storage for the program.
- **User Data:** Keeps track of user data such as name, email, date of birth, CNIC, address, and contact information.
- **Admin Info:** Contains details about administrators, used for system management.
- **Academic Data:** Keeps track of users' academic data, including registration number, batch, semester, and course of study.
- **Delivery:** Manages email notifications and other delivery-related information.
- **Payment:** Indicates the sender and recipient account numbers along with other payment-related details.
- **Attachment:** Holds user data attachments, including photos, CNICs, registration cards, clearance forms, and matriculation certificates.
- **Jazzcash, Easypaisa, and Bank:** These stand for various services or payment gateways that are available for usage in transactions.

Qualities:

- The qualities of each class are defined by its attributes. A few examples of properties found in the User Information class are name, email, dob, CNIC, contact, and address.
- Data types for attributes, including string, date and time, integer, and file, are given.

Connections:

- The relationships between classes are represented by lines connecting them.
- Instances of one class may be related to instances of another class, as indicated by the diamond shape, which denotes an association between two classes.
- The maximum and least number of instances of one class that can be connected to a single instance of another class are indicated using multiplicity notation (e.g., 1..*).

DATA FLOW DIAGRAM:

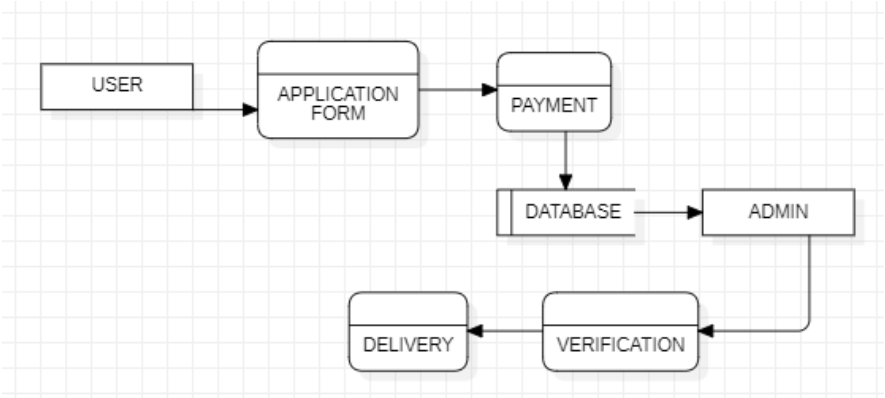


Figure 5: Data Flow

DESCRIPTION:

The "Automated System for Issuance and Dispatch of Educational Documents" is shown in this high-level design. It displays the various elements and how they work together.

This is an explanation of the diagram:

Parts:

- **User:** Stands for the actual user that communicates with the system.
- **Application Form:** Users submit this form in order to make a request for a service.
- **Payment:** This part takes care of making payments and work with payment gateways.
- **Database:** Holds application-related data, including payment and order information for users.
- **Admin:** System administrator, who has access to the database for management.
- **Delivery:** If applicable, this component manages the delivery of goods or services.
- **Verification:** This could be an information or payment verification procedure.

Relationships:

- The system's information flow or action flow is shown by the arrows.
- The Application Form is used by users to submit their requests.
- The Payment component is activated following form submission, and the user could be asked for payment details.
- Information about the user's request and payment is stored in the database.
- To manage system and keep an eye on activity, administrator has access to database.
- Delivery component could be in charge of delivering services or completing orders.
- Before taking any further action, the verification method could be utilized to confirm payments or information.

USE CASE DIAGRAM:

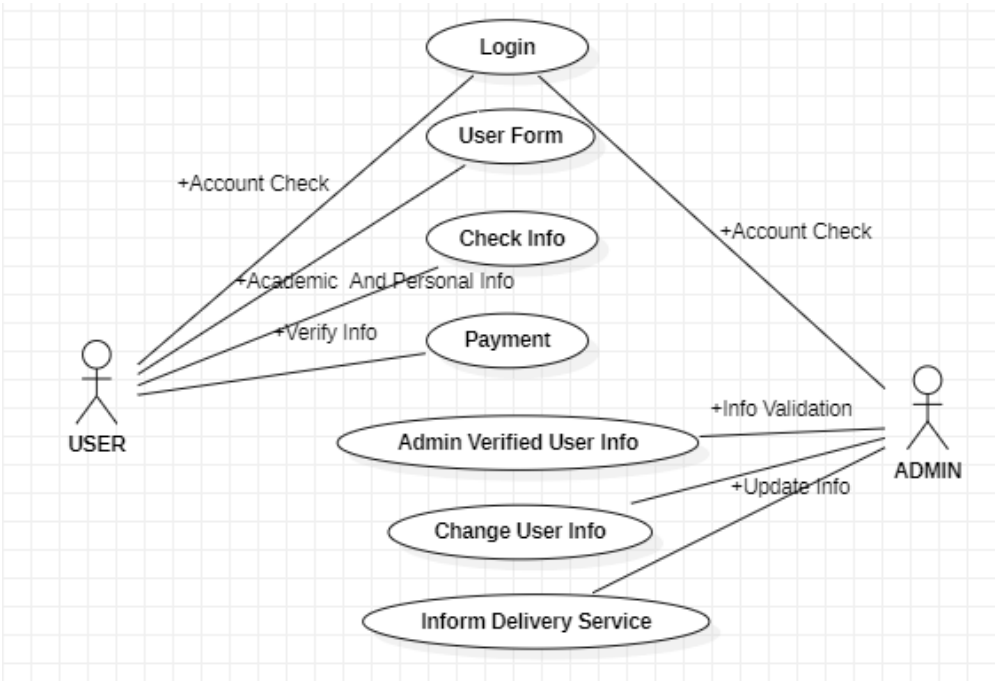


Figure 6: Use Case

DESCRIPTION:

This is an example of a use case diagram, which illustrates how users, or actors, interact with a system visually. It displays various use cases (features or services) that the system offers along with the ways in which actors can communicate with them.

This is how the use case diagram is broken down:

Actors:

- **USER**: Stands for the end user who communicates with the system.
- **ADMIN:** Stands for the administrator with more rights and the ability to carry out administrative duties.

Use Cases:

- **Login:** This signifies how a user logs into the system.
- **User Form:** It is probable that in this use case, the user will provide their information on a form.
- **Verify Info:** This signifies the system verifying the data that the user has submitted.
- **Academic and Personal Data:** Gathering academic and personal data from the user may be the purpose of this use case.
- **Verify Information:** This use case may entail manually or automatically checking the information that the user has submitted.
- **Payment:** The system's payment procedure is represented by this use case.
- **Admin Verified User Info:** In this use case, the user's information may be verified by the admin in order to grant specific rights or activities.
- **Modify User Info:** With this use case, users can make system-wide changes to their personal information.
- **Notify Delivery Service:** According to this use case, the system notifies delivery service of a request or order.

Connections:

- The relationships between actors and use cases are represented by the lines that connect them.
- The arrow signifies that the use case is started by the actor.
- The notation <<include>> implies that a use case is a sub-step of the main use case, implying that one use case includes another.

3.4 Ethical Consideration

There is a series of ethical issues that should be implemented in the development and execution of the 'Automated System for Issuance and Dispatch of Educational Documents'. It is paramount to ensure that rights, confidentiality, and informed consent of the participants are observed during the research process.

This would require system development in compliance with privacy and data protection regulations and laws that would, therefore, put up strong security to avoid their abuse, unauthorized access, or personal data breach.

Access to sensitive information will be limited to authorized staff, thus ensuring confidentiality. The use of encryption and secure storage options shall be used so that sensitive data is protected both in transit and at rest.

Every participant in the study process will have to give an informed consent. The goals of the study, automatic system operation, and possible hazards or benefits are going to be provided clearly and in great detail. There will never be a time when the participants feel obliged to continue the study and questions asked without necessarily paying fees.

Ethical issues, such as potential data breaches, information misuse, and ensuring that all participants have full disclosure over the consequences of their behavior, are among the challenges posed. These challenges can be mitigated through constant monitoring, frequent improvement of security protocols, and transparency with the participants.

This study would be conducted in adherence to the mission of achieving the highest degree of integrity, respect for individuals, and protection of personal information in the development of an “Automated System for Issuance and Dispatch of Educational Documents”.

Chapter No. 4

4 DEVELOPMENT AND TESTING

This chapter presents different testing methodologies followed to see the system's performance, reliability, and functionality. This chapter is supposed to give a full account of the setup, methods, and results of the tests done. This gives the briefs of the user acceptability, system, integration, and unit test carried out to ascertain the effectiveness of the system. The objective of the chapter is to give ways by which the automated system is dependable and ready to be deployed through this intense study.

4.1 Testing Plan

Introduction

This document illustrates the test case design based on different modules and expected results for the automated system of issuing and dispatching educational documents. It also consists of a table depicting all the detailed test cases along with the expected results and actual results.

Test Cases

Module	Description	Expected Result	Actual Result	Status
User Authentication	Verify login with valid credentials	User successfully logs in	User successfully logs in	Pass
User Authentication	Verify login with invalid credentials	Error message "Invalid credentials" is displayed	Error message "Invalid credentials" is displayed	Pass
Document Issuance	Issue a new educational document	Document is issued and saved in the database	Document is issued and saved in the database	Pass
Document Issuance	Issue a document with missing required fields	Error message "Required fields missing" is displayed	Error message "Required fields missing" is displayed	Pass
Document Dispatch	Dispatch document to the correct recipient	Document status is updated to "Dispatched"	Document status is updated to "Dispatched"	Pass
Document Dispatch	Dispatch document with incorrect recipient information	Error message "Recipient information incorrect" is displayed	Error message "Recipient information incorrect" is displayed	Pass
Notification System	Send notification upon document issuance	Notification is sent to the user	Notification is sent to the user	Pass
Notification System	Send notification upon document dispatch	Notification is sent to the recipient	Notification is sent to the recipient	Pass

Data Validation	Validate document details before issuance	All document details are correct and valid	All document details are correct and valid	Pass
Data Validation	Validate document details before dispatch	All document details are correct and valid	All document details are correct and valid	Pass

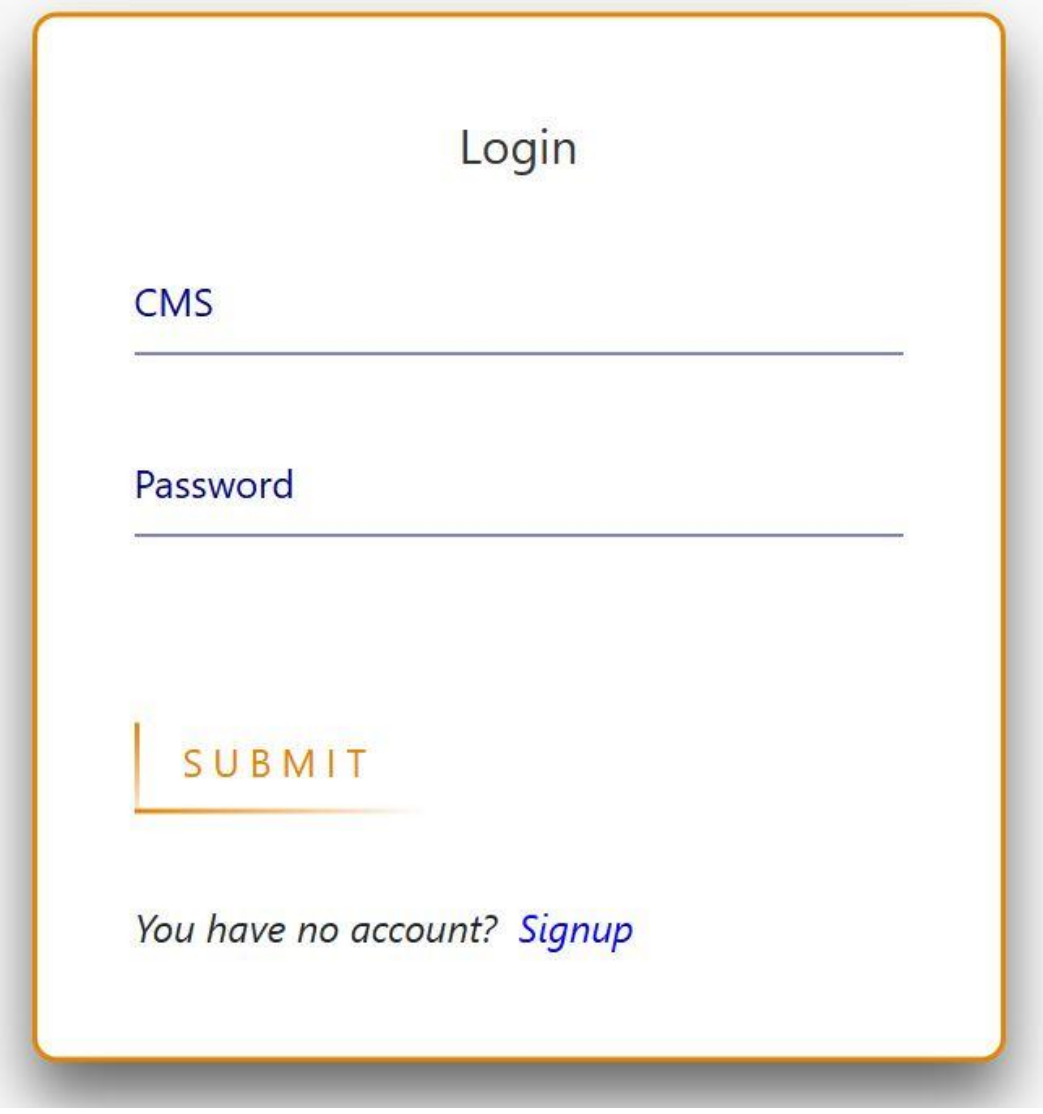
Table 1: Test Cases

Conclusion

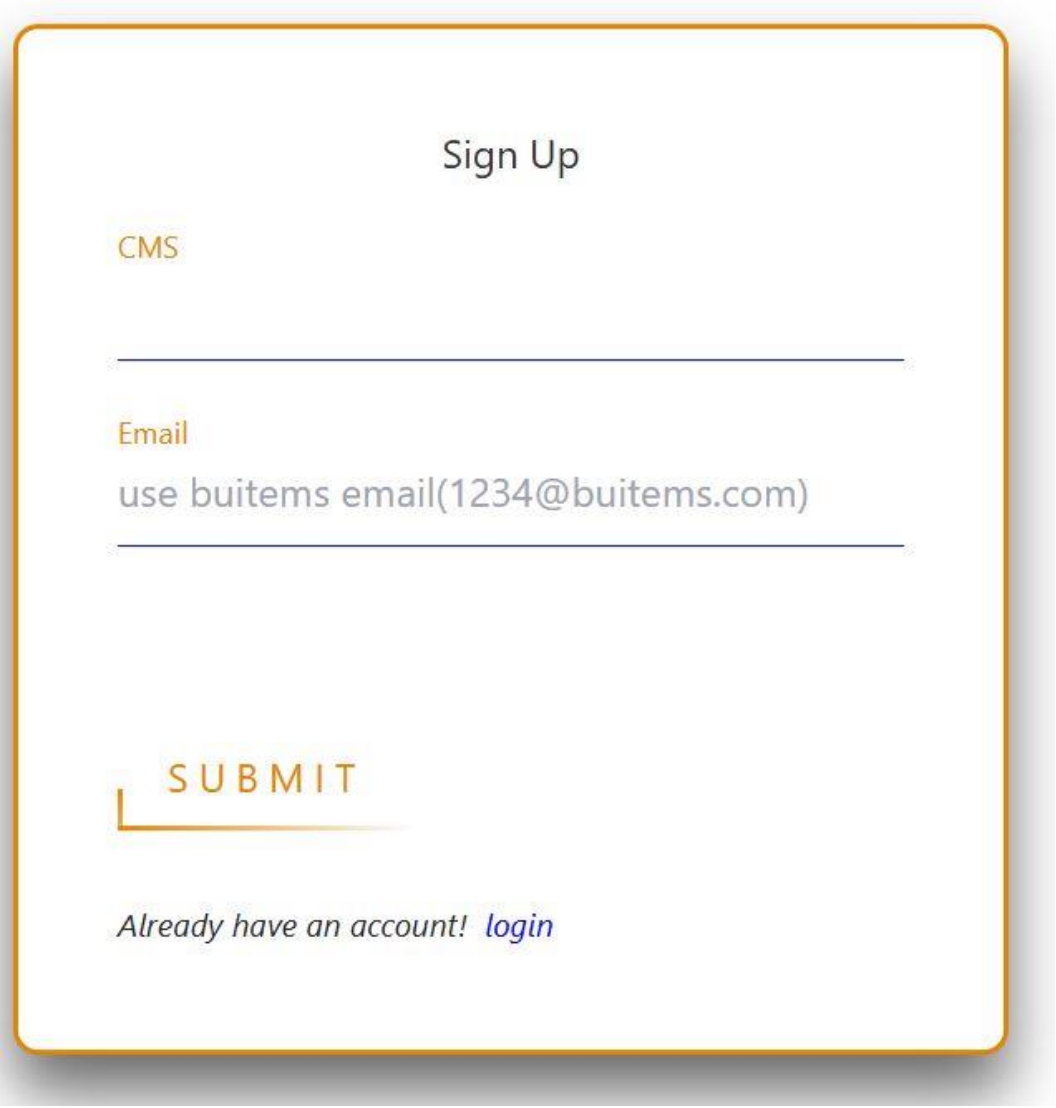
The "Automated System for Issuance and Dispatch of Educational Documents" test plan involves a general view of the executed test cases. Each of them is, in fact, directed to verify specific functionalities, and the results represent the criteria of the system. If successfully carried out, the test could bring assurance in the reliability and efficiency of the system.

4.2 Test Results

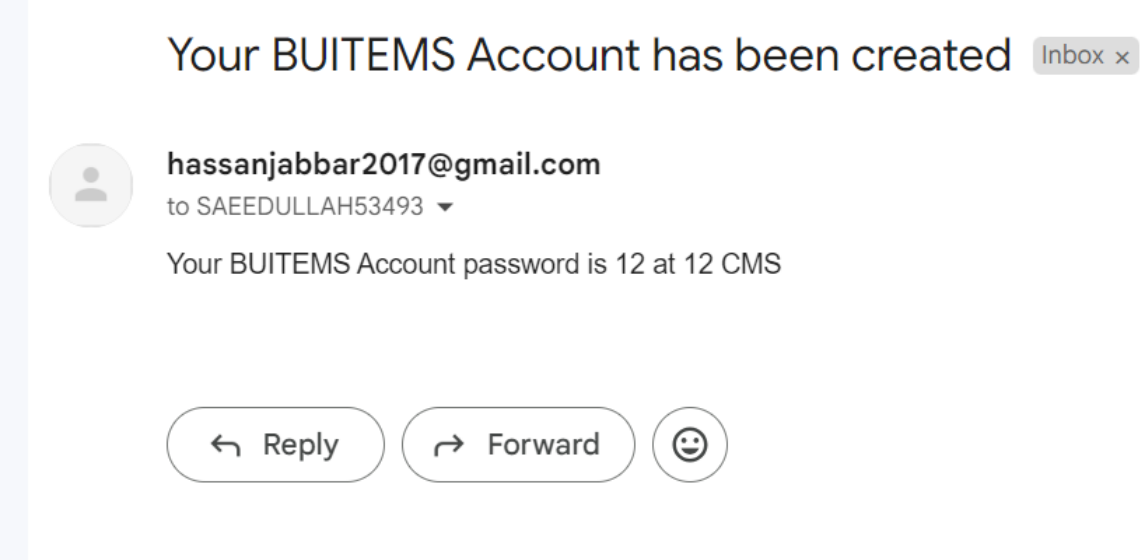
SignIn/SignUp:



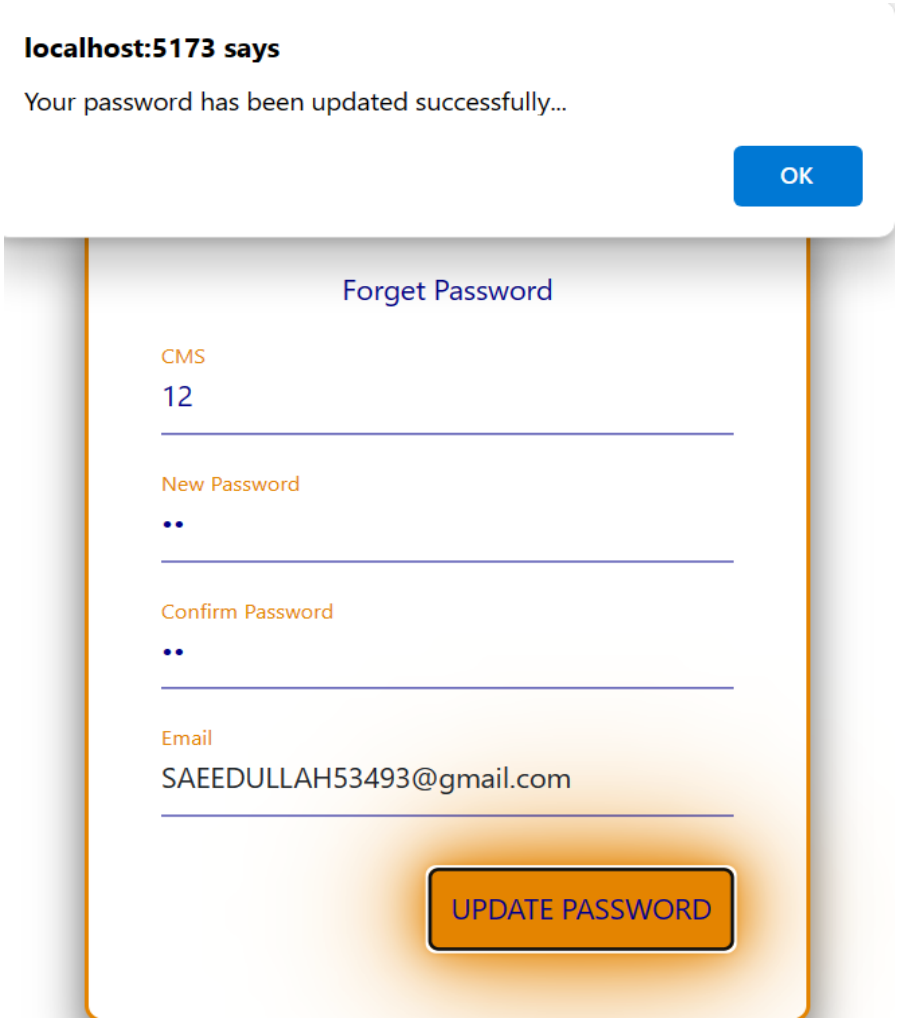
Registration:



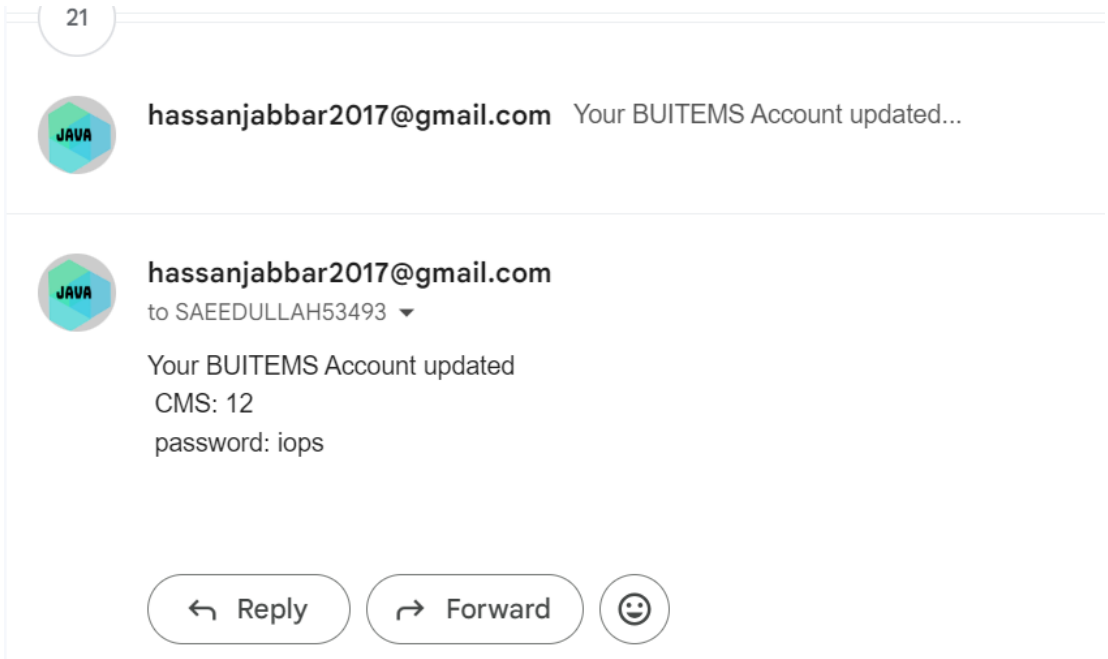
Confirmation Email:



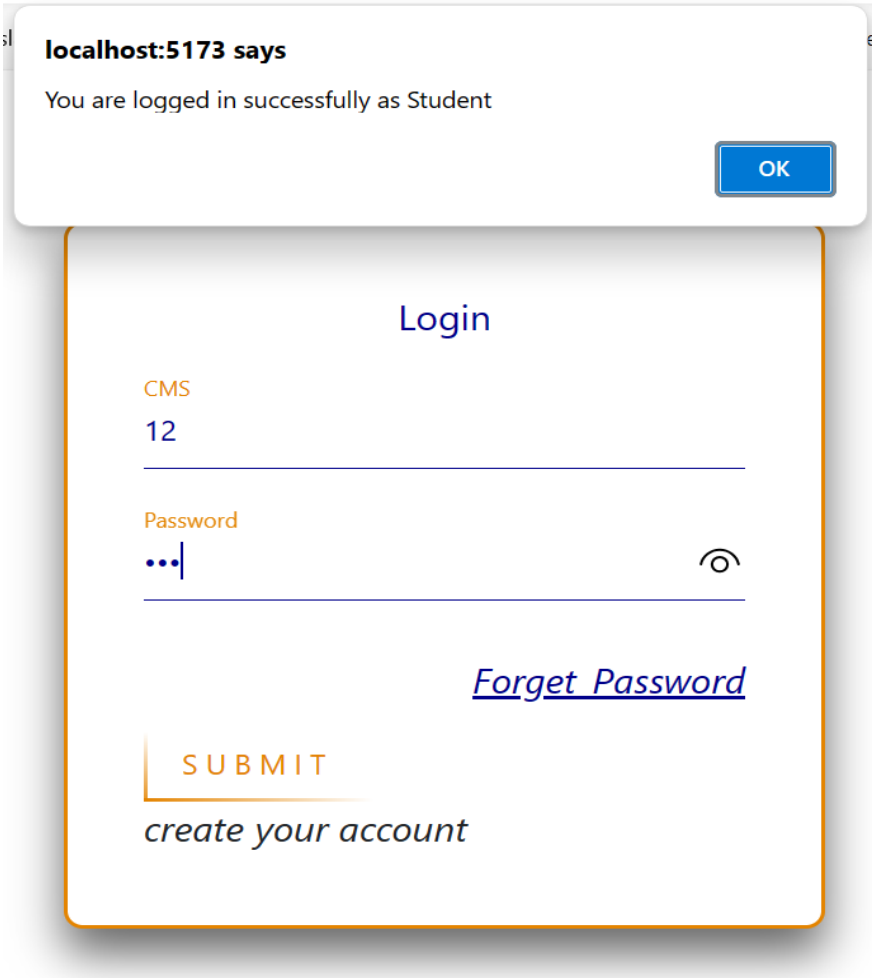
Forget password:



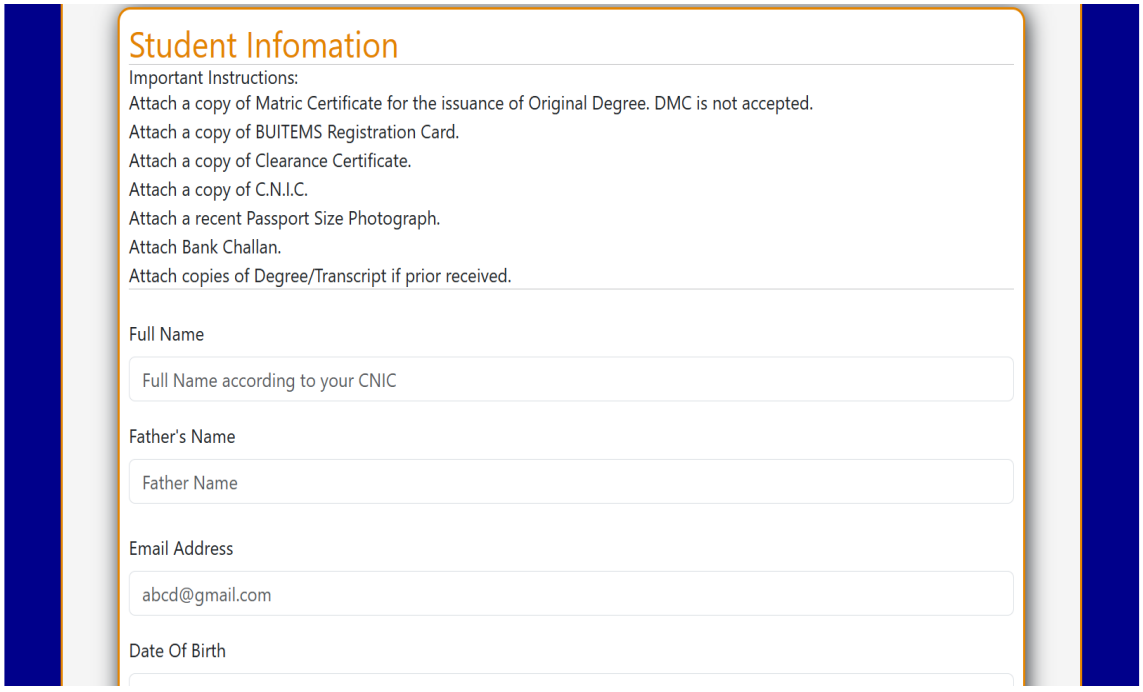
New password email:



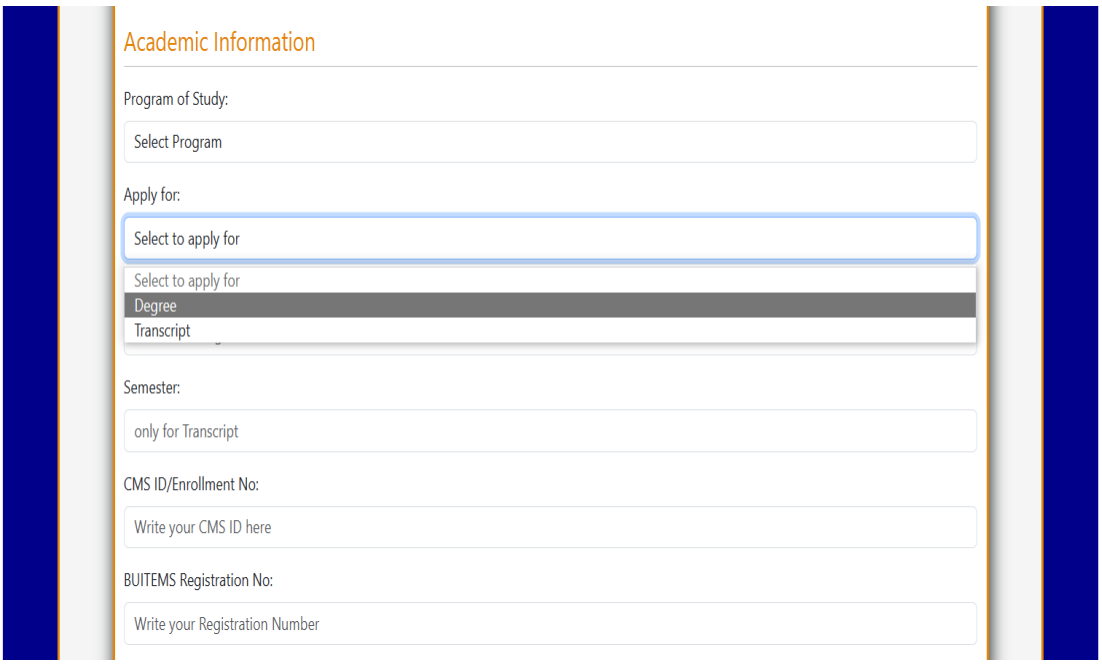
Student Login:



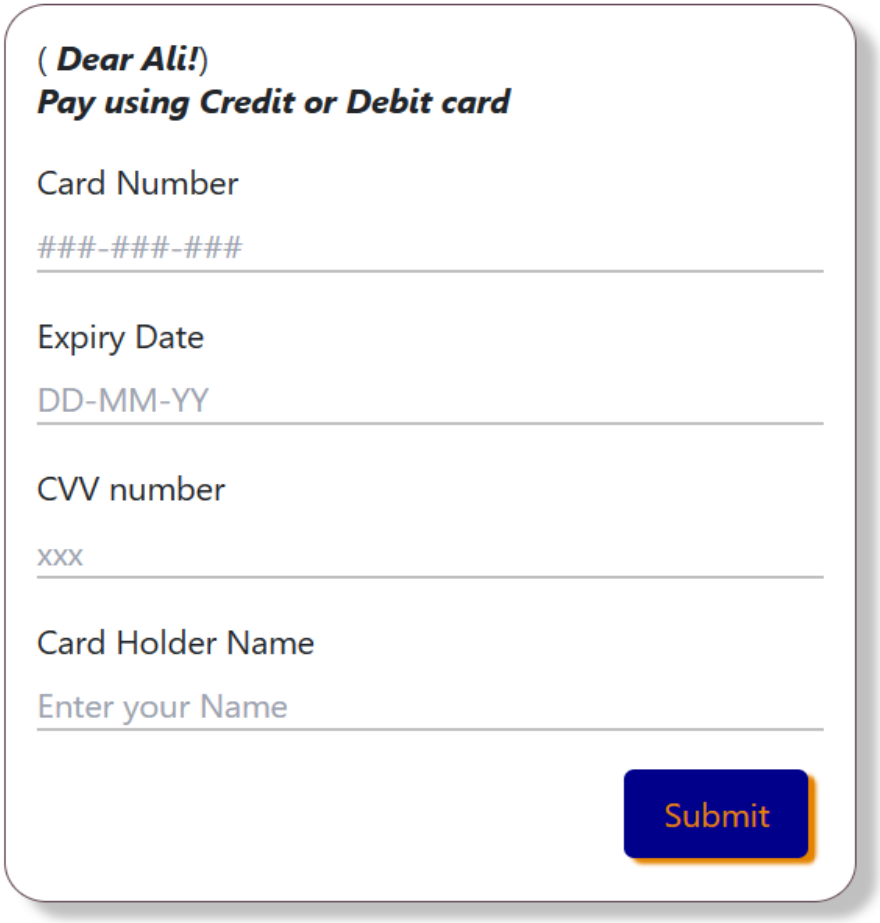
Personal Information:



Academic Information:

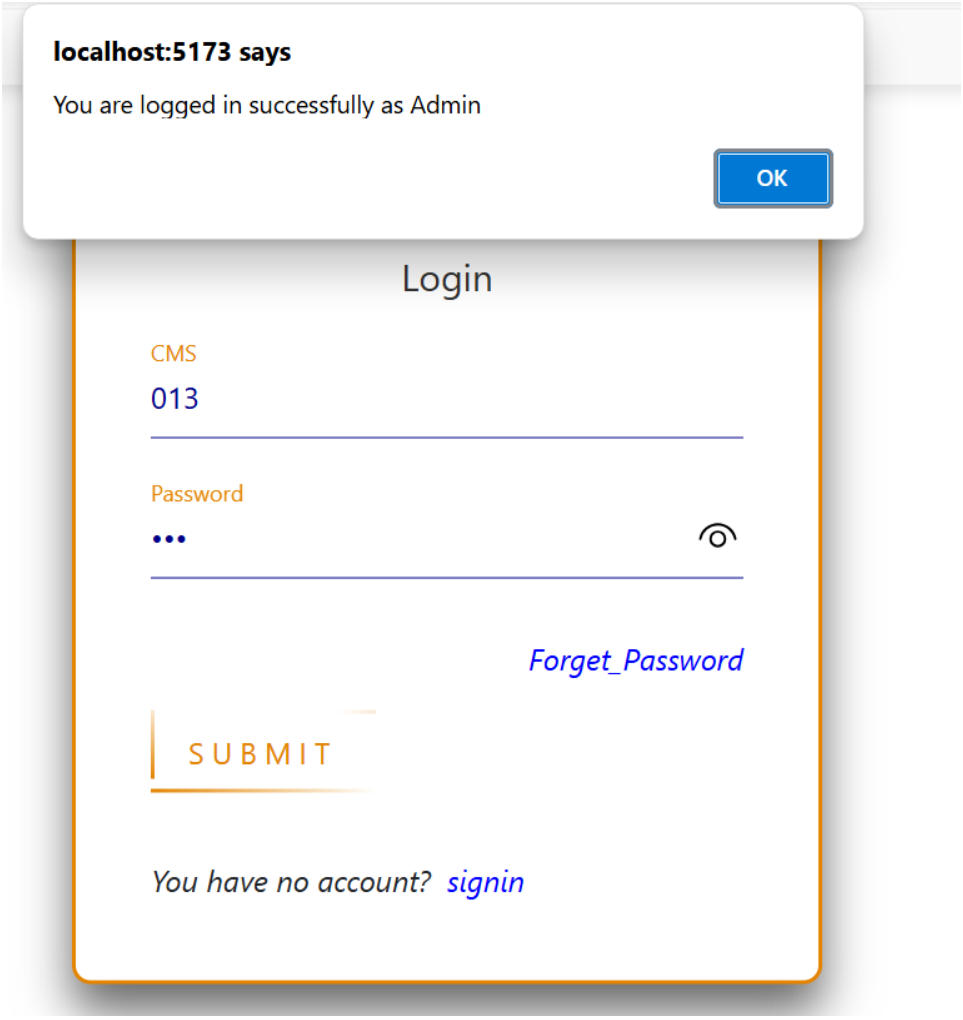


Payment:

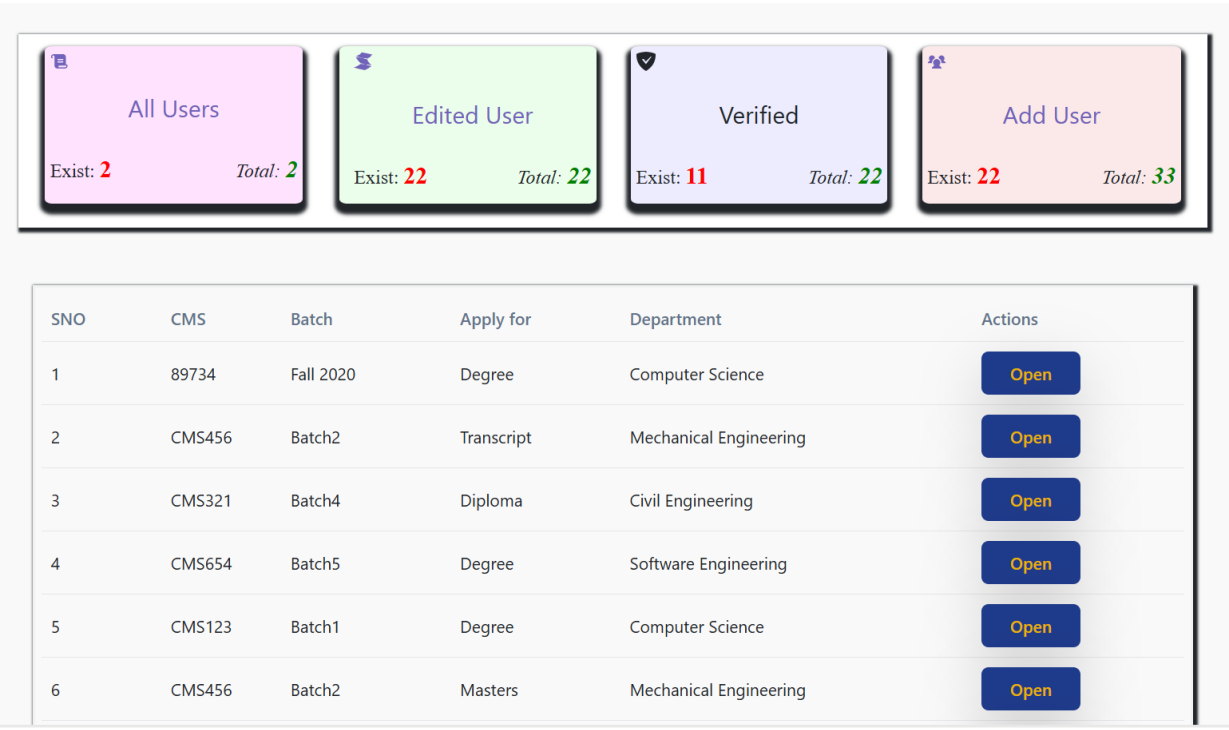


Thank you Page:

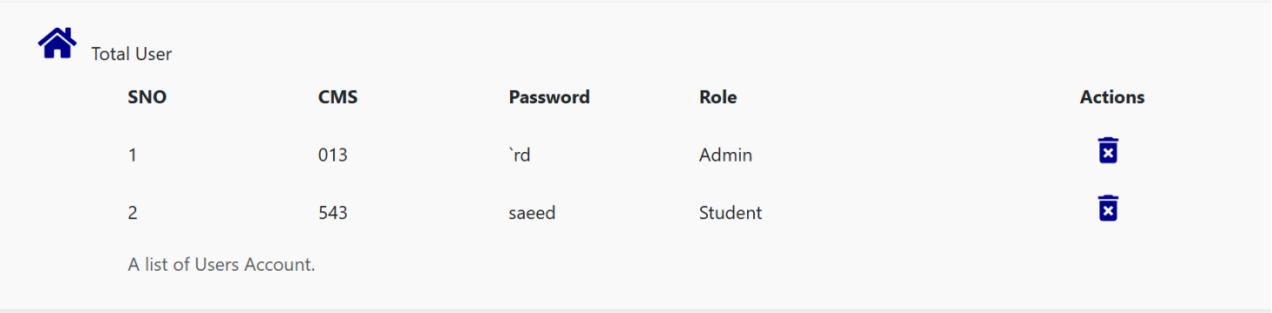
Admin Login:



Admin Dashboard:

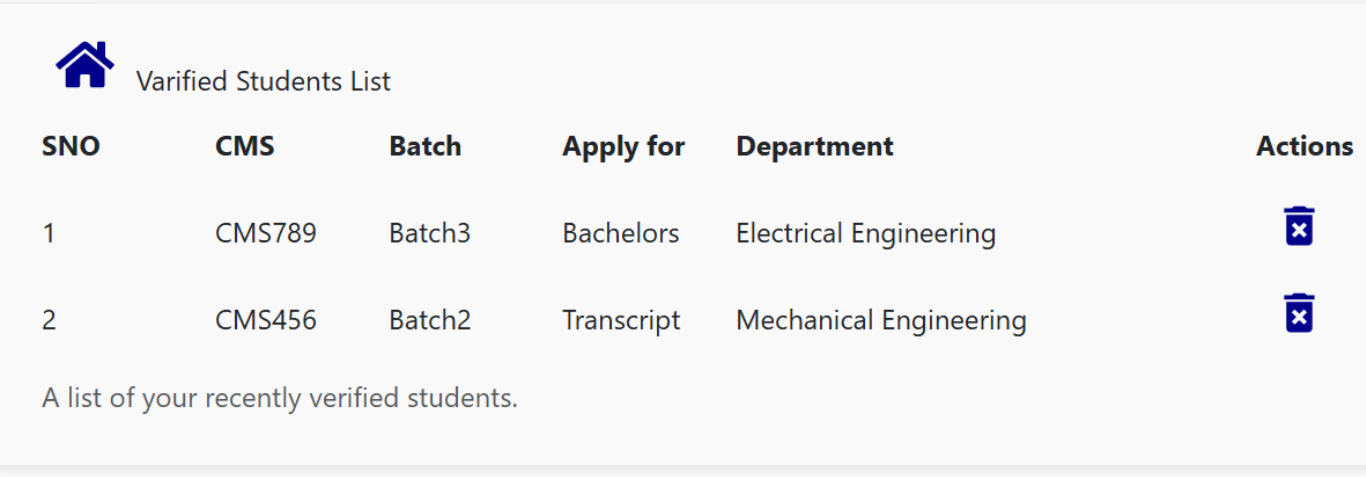


All users list:

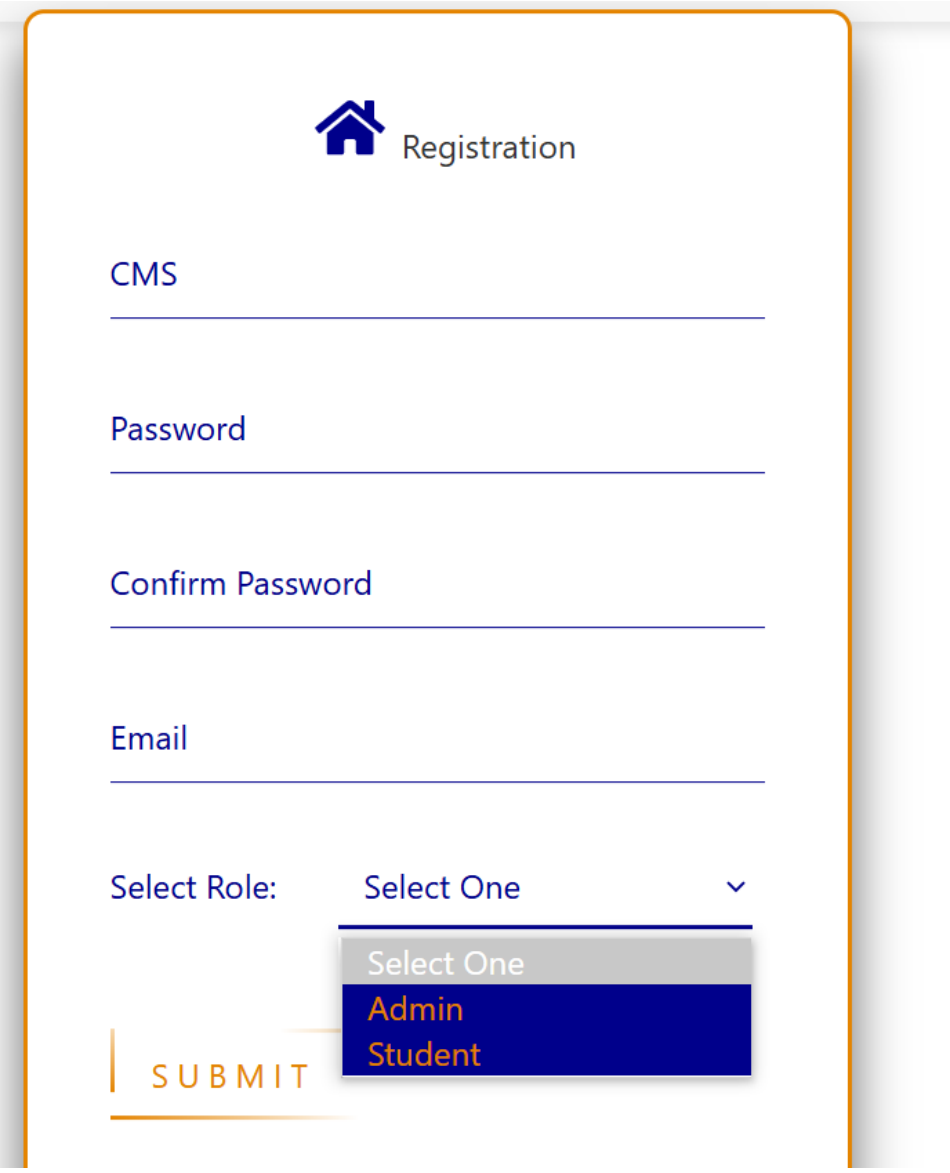


Updated users list:

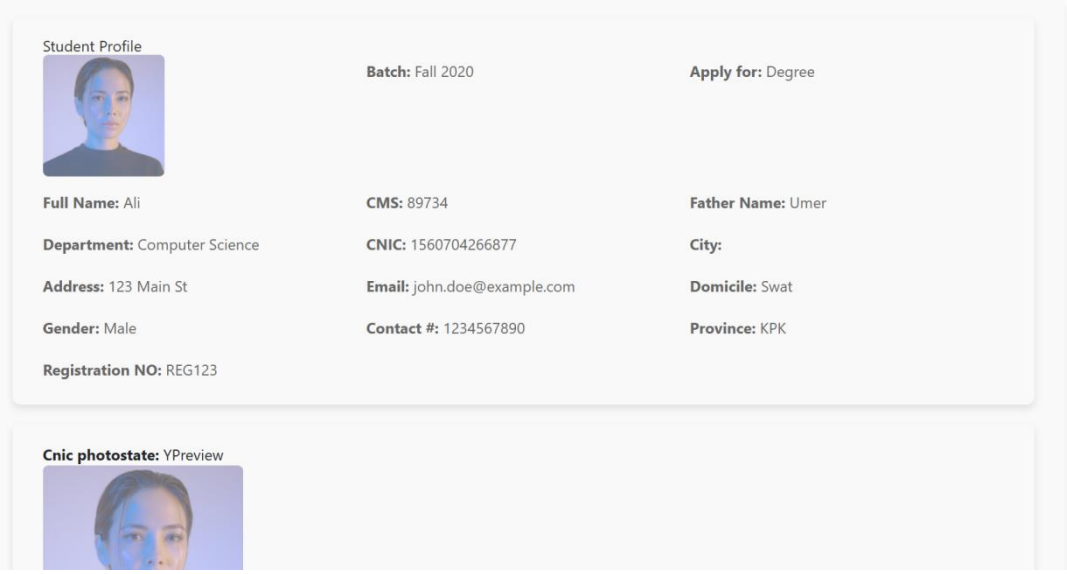
Verified users list:



Add new user:

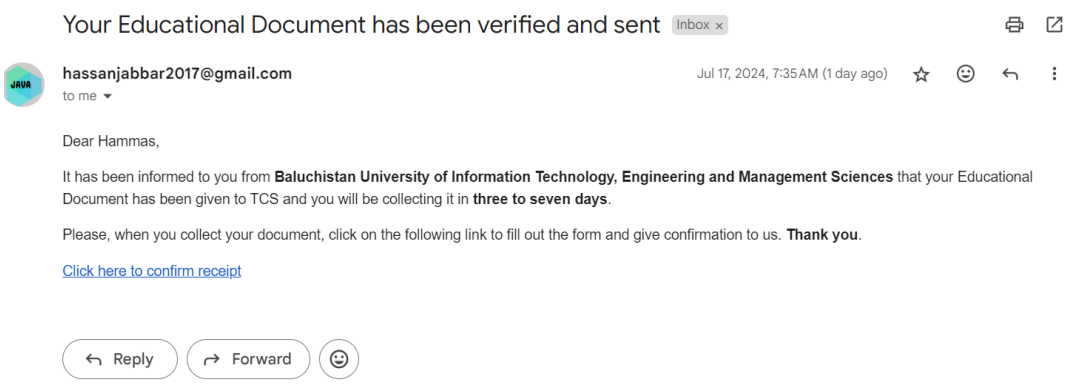


Students Data:



Edit/Verify student's application:

Student Email:



Student Confirmation List:

Received Confirmation List

SNO	CMS	Name	CNIC	Documents Recived
1	53493	saeed	3243252	Yes
2	53851	hammas	5440068782867	Yes

A list of your recently verified students.

TCS Email:

Your Educational Document has been varified and sent Inbox ×

hassanjabbar2017@gmail.com
to me

9:05 AM (50 minutes ago)

Dear TCS!

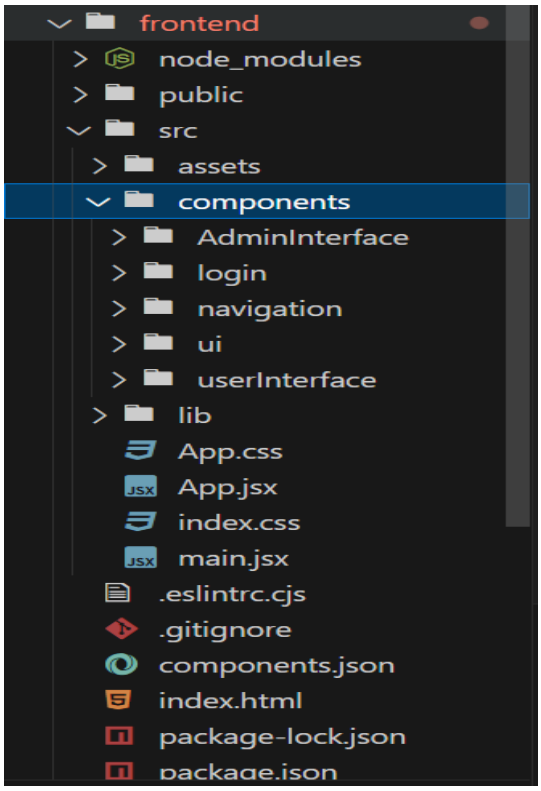
It has been informed you to collect Educational Document from **Baluchistan University of Information Technolog, Engineering and Management Sciences to give to the following Address.**

Address: Chasma Chowk, Near BUITEMS Quetta

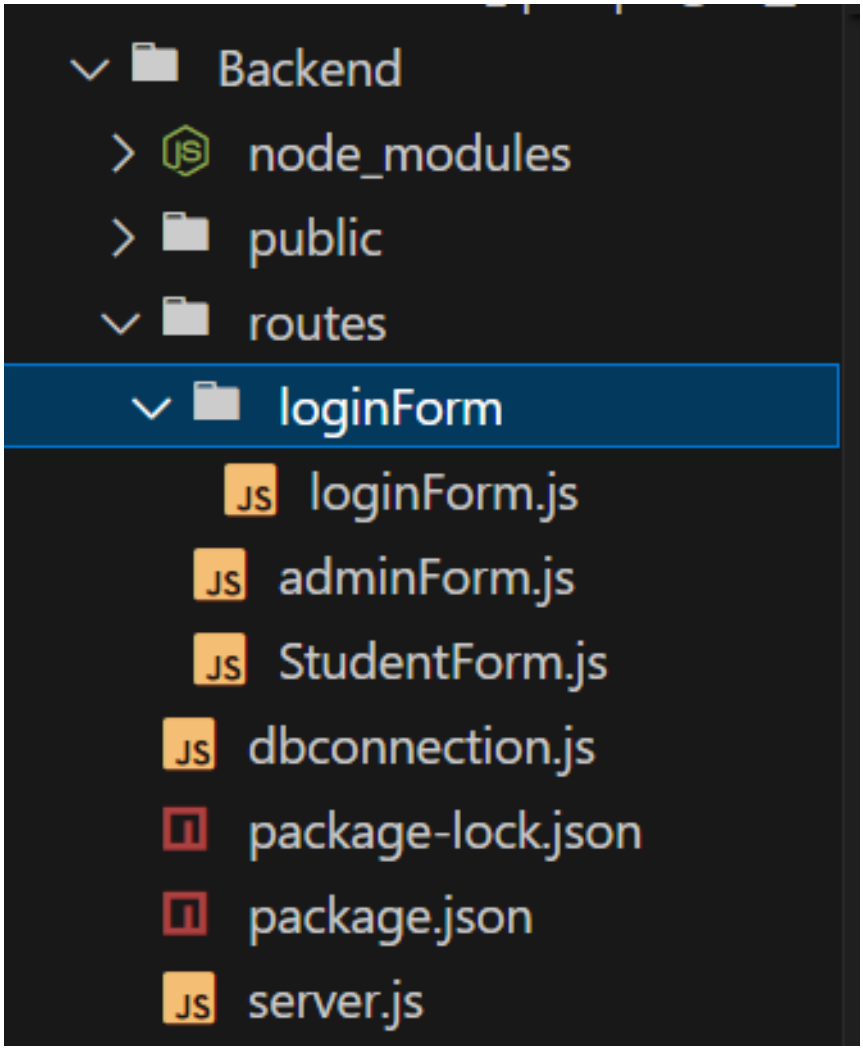
.Thank you

Reply Forward

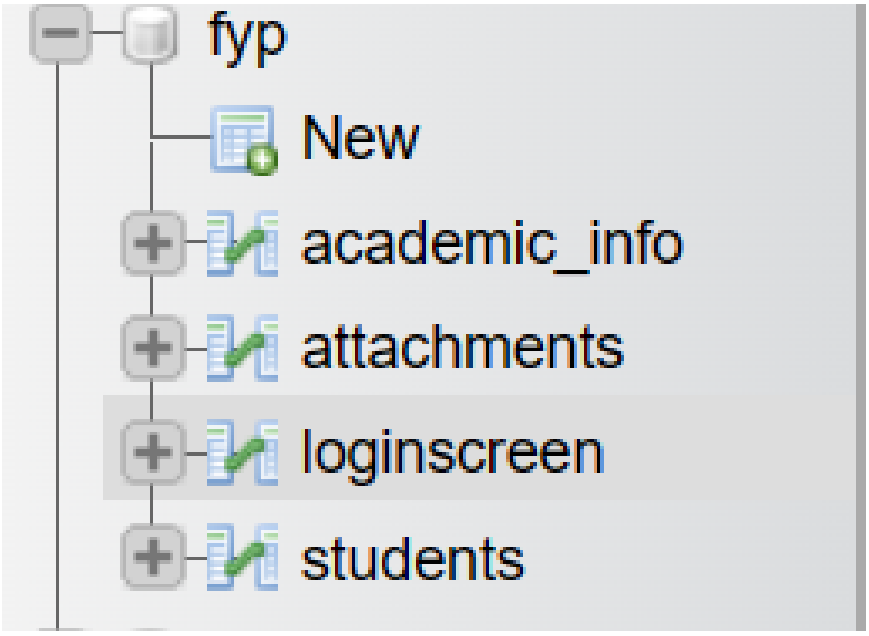
Front-End Files:



Back-End Files:



Database Files:



Chapter No. 5

5 CONCLUSION AND FUTURE WORK

5.1 Conclusion

'Automated System for Issuance and Dispatch of Educational Documents' improves efficiency in maintaining educational documents, decreases human error, and simplifies the process. Key activities are automated to guarantee timeliness and accuracy, which greatly benefits educational institutions and their stakeholders. Our initiative advances the field by offering a reliable solution to prevailing problems with document distribution and processing, therefore establishing a new benchmark for operational excellence in the field of educational administration.

5.2 Future Work

Relying on the limitations and gaps of this project, there are some other areas that would require further study or improvement.

- **Better Security Measures:** To ensure better security of the issuance and mailing of educational documents, future studies may explore more advanced security measures and encryption methods.
- **Scalability and Performance Optimization:** Emphasis can be put on an optimized function in future development regarding server capability, database performance, and implementing load-balancing to ensure effective management in heavy traffic.
- **Integration with Educational Institutions:** Further research may also aim to look at the compatibility between existing systems that are used in all these different educational institutions. Common application programming interfaces and interoperability guidelines can be established in order to ease communication flow among institutions and automated systems for information sharing.
- **Enhancements to the User Experience:** It becomes very important to improve the user interface and experience for the administrator and students in future work. Some of the future initiatives might also go into performing more detailed user research toward pinpointing problems and implementation of design alterations that could make it more intuitive and user-friendly.
- **Integration of AI and Machine Learning:** AI and machine learning algorithms can be incorporated to improve the overall functionality of the system. For instance, intelligent Chabot might help users with some common queries and troubleshooting, and predictive analytics could be leveraged for document demand estimation.

- **Legal Framework and Regulatory Compliance:** It is of utmost importance to research and become adjustable to the diverse legal and regulatory environments existing in different geographical locations. Follow-up activity could center on ensuring that the system complies with regional, national, and global laws on digital signatures, document authenticity, and data protection.
- **Disaster Recovery and Backup Plans:** It is important to have robust strategies for disaster recovery and backup to avoid losing data and to continue operating. The more sophisticated tactics for backup later on will include cloud-based solutions and remote storage.
- **Feedback and Mechanisms for Continuous Improvement:** A system for gathering user and stakeholder feedback will enforce improvement on an ongoing basis. Future research could establish automatic feedback systems to collect data in an iterative cycle, using user feedback to inform and implement improvements.

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[4]. Santos, P., & Silva, A. (2023). Automating the issuance of educational documents: A literature review. Journal of Applied Research in Education, 13(1), 1-10.

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APPENDICES

APPENDIX A

CODE

All the source code files are uploaded in this Github repository:

AppDevelopments/ProjectSourceCode.rar at main · saeedullah53493/AppDevelopments · GitHub