StudyMate – AI Powered Advanced Quiz Creator

Final Year Project Report

Submitted by

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In partial fulfilment of the requirements for the degree of
Bachelor of Science in Software Engineering
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Hamdard University, Main Campus, Karachi, Pakistan

Certificate of Approval

Faculty of Engineering Sciences and Technology

Hamdard Institute of Engineering and Technology
Hamdard University, Karachi, Pakistan

This project "**StudyMate**" is presented by **Abubakar Zaidi and Hanzala Siddiqe** under the supervision of their project advisor and approved by the project examination committee, and acknowledged by the Hamdard Institute of Engineering and Technology, in the fulfillment of the requirements for the Bachelor degree of Software Engineering.

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Authors' Declaration

We declare that this project report was carried out in accordance with the rules and regulations of Hamdard University. The work is original except where indicated by special references in the text and no part of the report has been submitted for any other degree. The report has not been presented to any other University for examination.

Dated: 14/01/2025

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Plagiarism Undertaking

We, S. M Abubakar Zaidi and Hanzala Siddiqe, solemnly declare that the work presented in the Final Year Project Report titled “StudyMate – AI Powered Advanced Quiz Creator” has been carried out solely by ourselves with no significant help from any other person except few of those which are duly acknowledged. We confirm that no portion of our report has been plagiarized and any material used in the report from other sources is properly referenced.

Dated: 14/01/2025

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S. M Abubakar Zaidi
Hanzala Siddiqe

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Document Information

Table 1: Document Information

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Definition of Terms, Acronyms, and Abbreviations

This section should provide the definitions of all terms, acronyms, and abbreviations required to interpret the terms used in the document properly.

Table 2: Definition of Terms, Acronyms, and Abbreviations

OCR	Optical Character Recognition
AI	Artificial Intelligence
LLM	Large Language Model
GUI	Graphical User Interface
API	Application Programming Interface
SQL	Structured Query Language
HTTP	HyperText Transfer Protocol
JSON	JavaScript Object Notation
UML	Unified Modeling Language
ERD	Entity-Relationship Diagram
CRUD	Create, Read, Update, Delete
HTML	HyperText Markup Language
CSS	Cascading Style Sheets

Abstract

Students and learners often face challenges and issues related to studies and generally tend to overcomplicate the study process by focusing on insignificant and irrelevant topics that are not expected to appear in exams, all because students get confused about what topic to study and what not to and this creates ambiguity and wastes serious amount of students' time and efforts.

Our project titled "StudyMate - AI Powered Advanced Quiz Creator" aims to address this issue by providing students and learners a platform where they can study effectively and adequately without wasting any time, focusing on only the most important topics that are likely to appear in exams, this reduces significant amount of manual efforts that they were previously executing by going through all the notes and reviewing everything.

StudyMate works by allowing users to upload their handwritten notes that they prepared throughout their semester and digitizing their notes, fixing any grammar or structure issues that might occur and giving the users option to generate study materials such as Quizzes or QnAs based on only the important information from the notes for effective study. Students can then attempt the quizzes and review the subjective questions for a better understanding of the course and topics; additionally students can also generate materials based on specific topics from the notes.

The technologies used to develop StudyMate include Optical Character Recognition (OCR) for digitizing handwritten notes, Large Language Model such as Meta Llama 3.1 for detecting topics, and generating study materials from extracted text and Django web application framework.

Keywords:

AI-powered Learning, Optical Character Recognition (OCR), Large Language Models (LLM), Quiz Generation, Q&A Creation, Handwritten Notes Digitization, Personalized, Education, Educational Technology, Academic Efficiency, Spiral Development Methodology

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CHAPTER 1

INTRODUCTION

1.1 Motivation

Education is advancing speedily, with technology playing amazing role in effective learning. Older methods of study contain manually transcribing handwritten notes and involves time-consuming creation of quizzes, which generally leave students less time to focus on learning. Furthermore, educators and instructors face problems in creating content to suit needs of individual students. This project, StudyMate, is motivated by the aspiration to address these inefficiencies by utilizing artificial intelligence to automate content management and quiz generation. By converting raw, handwritten notes into structured, digital study materials, StudyMate aims to modernize the learning process by making it more accessible, engaging, and efficient.

1.2 Problem Statement

Students generally face the challenge of manually preparing for studies using resources such as handwritten notes, this process is both time-consuming and error-prone. Handwritten notes lack structure most of the time, which makes them difficult to review and utilize effectively. Additionally, creating quizzes and Q&A modules for personal study preparation or classroom use requires a large amount of effort, which could be spent on teaching or learning. Existing tools do not provide an end-to-end process of note digitization, content organization, and educational material generation in a single application. This unavailability becomes a major barrier for students to achieve great results not just in grades but in learning as well.

1.3 Goals and Objectives

The main goal of this project is to develop StudyMate, a platform where students can automate the learning process by converting handwritten notes into structured digital text and generating attemptable engaging quizzes and Q&A. The objectives include:

- Utilizing OCR technology to correctly digitize handwritten notes.
- Using LLMs to correct spelling and grammatical errors to make sure the text is accurate.
- Generation of quizzes and question-answer pairs to enhance learning and retention.
- Development of a web-based application with a user-friendly interface that allows users to easily perform their tasks.

1.4 Project Scope

- Integration of a powerful OCR module for extracting text from handwritten notes.
- Integration of an advanced LLM for content generation and grammar correction.
- Creation of an interactive web application using Django for user interface and backend operations.
- Implementation of functionalities and features for generating quizzes and Q&A pairs based on user-specified topics.
- Storage and retrieval of notes and generated materials on Google Cloud Storage for future use.

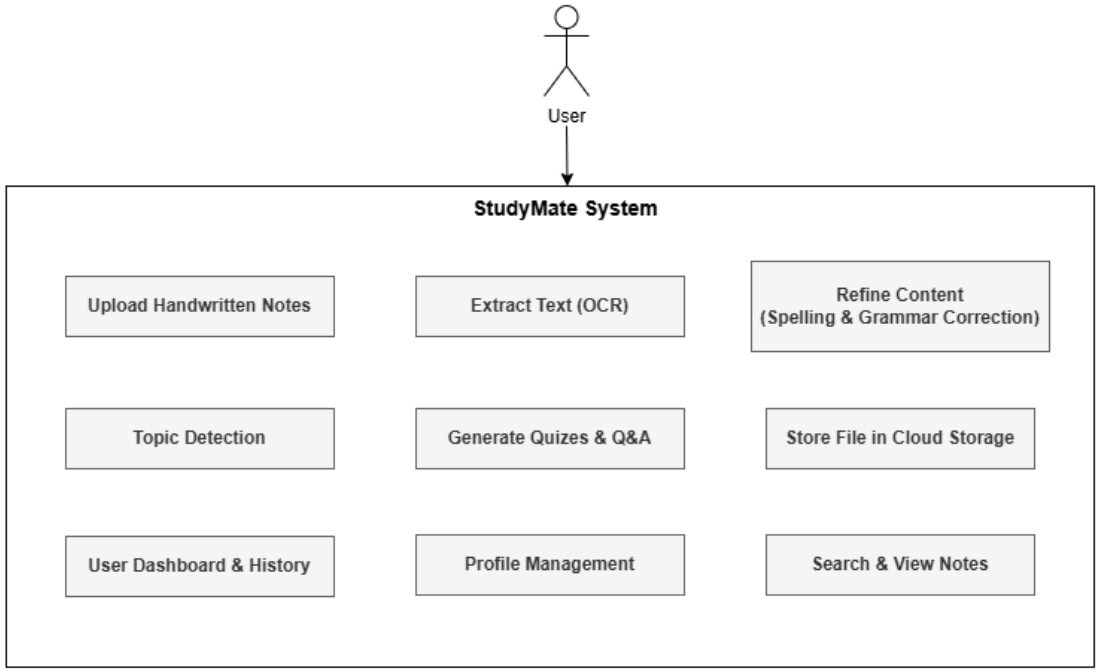

Figure 1.1

CHAPTER 2

RELEVANT BACKGROUND & DEFINITIONS

The usage of artificial intelligence into education has led to a transformation in how knowledge is acquired and shared to others. Automated tools and platforms are now playing an important role in supporting students by simplifying difficulties in the study process. StudyMate, is a similar automated platform, which is built using technologies such as Optical Character Recognition (OCR) and Large Language Models (LLMs) to highlight and address the inefficiencies in traditional learning methods. This chapter will provide a detailed analysis and background on the technologies, concepts used in the development of StudyMate.

2.1 Optical Character Recognition (OCR)

OCR is a type of technology that lets you extract text out of images or handwritten documents. OCR can accurately identify and digitize characters using advanced machine learning algorithms. This makes it possible to edit and search handwritten or scanned text. Modern OCR tools, like Google Vision API, can be very accurate even when the input is hard to understand, like bad handwriting or complicated layouts.

Relevance to StudyMate:

OCR is the first step in the StudyMate pipeline. It changes handwritten notes into digital text so that they can be processed further.

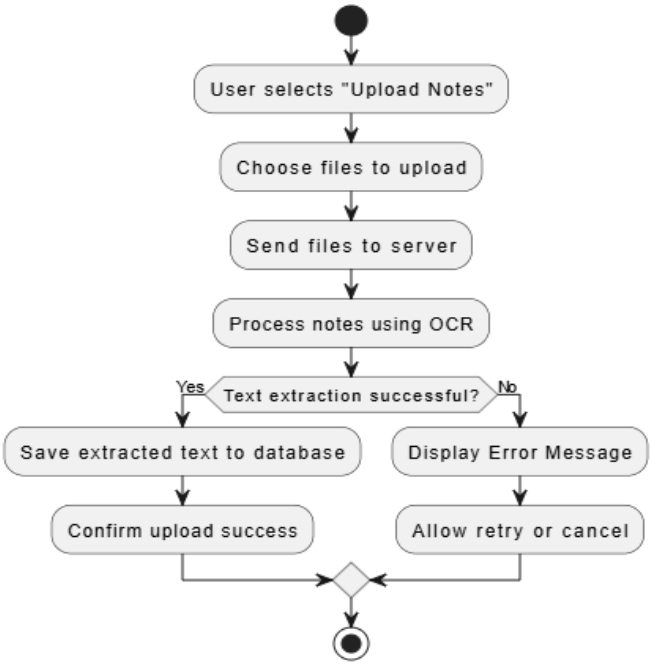

Figure 2.1

2.2 Large Language Models (LLM)

LLMs, like LLaMA 3.1 and GPT-based models, are a big step forward in understanding and generating natural language. These models learn from huge amounts of data and can perform operations like fix grammar, improve text, summarize content, and come up with questions.

Relevance to StudyMate:

StudyMate uses LLMs to process digitized text, making it easier to read and better organized, and it also makes quizzes and Q&A modules that are tailored to each user's needs.

2.3 Artificial Intelligence in Education

AI in education aims to make learning more personalized, automate repetitive tasks, and provide useful information. Some examples are adaptive learning platforms, virtual tutors, and content creators that use AI.

Relevance to StudyMate:

StudyMate fits with this trend by automating the creation of study materials, which makes it easier and more personalized for users.

2.4 Quiz and Question Generation

Automated quiz generation involves using AI to create multiple-choice questions, short answers, or descriptive questions from input text.

Relevance to StudyMate:

StudyMate converts learnable content into quizzes and Q&A pairs, StudyMate helps students in learning and assessing what they learned effectively.

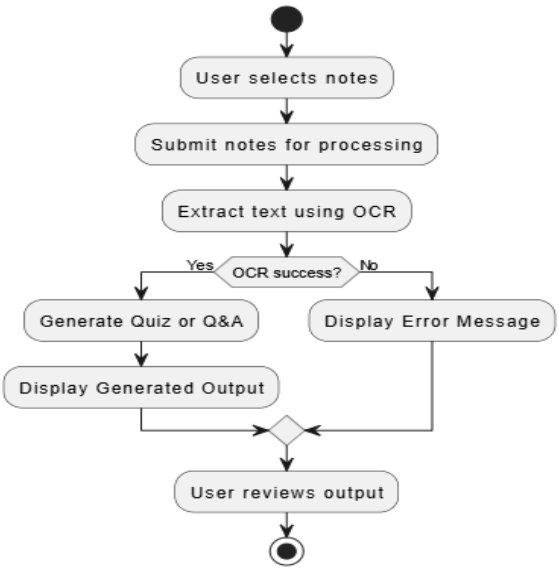

Figure 2.2

2.5 Web Application Architecture

Web application consist of multiple layers, including:

- User Interface (UI) Layer: Interacts with the user.
- Application Layer: Handles the core logic and operations.
- Data Layer: Manages the storage and retrieval of data.

Relevance to StudyMate:

StudyMate uses a Django-based architecture with a relational database to make sure user interactions and data management are secure and seamless.

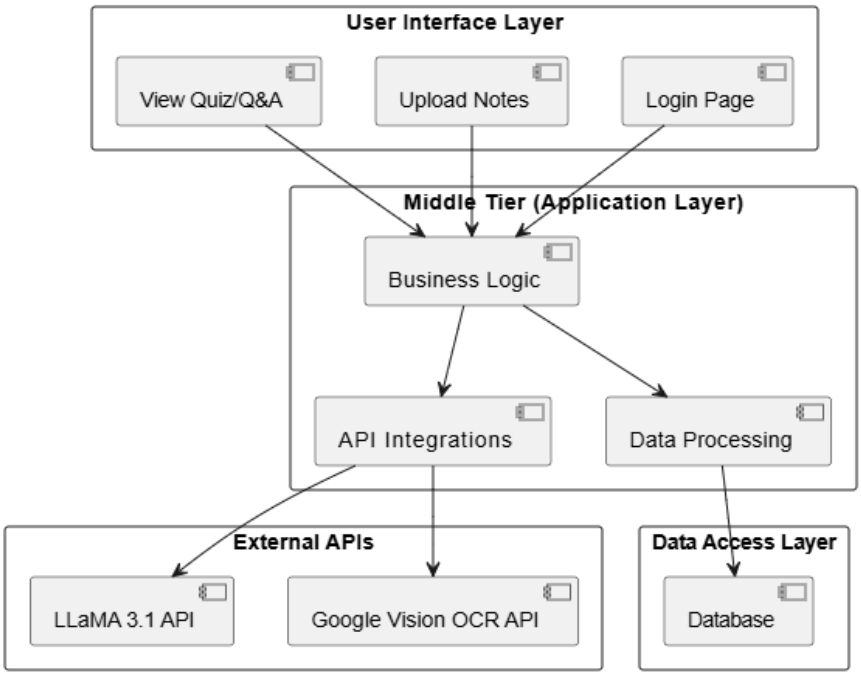

Figure 2.3

CHAPTER 3

LITERATURE REVIEW & RELATED WORK

3.1 Literature Review

The field of educational technology is advancing and so are applications aimed at improving students' learning experiences. Many platforms focus on quiz generation, content summarization, and study aids. However, few really address the challenges associated with the integration of handwritten notes into digital learning. This literature review focuses on explaining existing tools, compares their features, and highlights which factors differentiate StudyMate from these applications.

3.2 Related Work

1. Quizlet

Quizlet is one of the most famous educational platforms, which provides flashcards, quizzes, and games. It also allows users to create their own content or use existing study sets created and shared by other users. However, they require users to manually input their notes or text for content creation, which can turn out to be very time-consuming for students managing large amount of notes notes.

Key Differences with StudyMate:

- Quizlet cannot extract text from handwritten notes.
- StudyMate automates the quiz and question-generation process from raw notes, which can save significant time and effort of students.

2. Kahoot!

Kahoot! is another platform that specializes in interactive learning as it creates engaging quizzes and games. It also includes collaborative learning in a classroom environment but it does not provide functionalities to extract or process handwritten notes or text or provide grammar corrections for written text.

Key Differences with StudyMate:

- Kahoot! focuses on interactive learning but does not offer content creation of user’s choice.
- StudyMate on the other hand includes grammar refinement and quiz generation from handwritten notes or text.

3. Socratic by Google

Another AI-based application that helps students solve problems by scanning printed data or by manually inputting questions. It provides necessary resources, such as videos or explanations, to help in understanding the topics. However, it also does not support handwritten text processing or quiz creation.

Key Differences with StudyMate:

- StudyMate focuses on handwritten notes and digital learning by extracting and improving handwritten text.
- StudyMate also generates learning materials, including quizzes and question-answer pairs, using user selected topics.

3.3 Gap Analysis

Identified Gaps in Existing Tools

1. **Manual Input Dependence:** Most of the existing tools rely on user input for creating quizzes and study material, which increases the time and effort required from students.
2. **Limited Handwriting Integration:** There are many applications with OCR capabilities that focus on text digitization but do not enhance the text or create learning materials from the text.
3. **Lack of Contextual Refinement:** There are very few tools that refine the extracted text for spelling and grammar before transforming it for educational use.
4. **Absence of End-to-End Solutions:** There are very few platforms that offer an end-to-end workflow from note digitization to quiz generation.

Gap Analysis Table

Functional Area	Quizlet	Kahoot!	Socratic by Google	Microsoft OneNote	StudyMate
Handwritten Text Extraction	Not Supported	Not Supported	Not Supported	Supported (basic OCR)	Supported
Spelling and Grammar Refinement	Not Supported	Not Supported	Not Supported	Not Supported	Supported
Automated Quiz and Q&A Generation	Supported (manual input required)	Supported (live interactive quizzes)	Not Supported	Not Supported	Supported
Topic Detection and Selection	Not Supported	Not Supported	Not Supported	Not Supported	Supported
End-to-End Workflow Integration	Not Available	Not Available	Not Available	Not Available	Fully Integrated Workflow

Secure Cloud Storage Integration	Not Supported	Not Supported	Not Supported	Supported (file storage only)	Supported
Personalized User Dashboard and History	Not Available	Not Available	Not Available	Not Available	Available
Search and Retrieval of Materials	Partially Supported (search flashcards)	Not Supported	Limited (search for explanations)	Supported	Fully Supported

Table 3.1

Uniqueness of StudyMate

- **End-to-End Functionality:** StudyMate integrates OCR, text refinement, and quiz generation into a single application, which eliminates the need to use multiple tools.
- **Handwritten Notes Processing:** Unlike most applications, StudyMate extracts text from handwritten notes using OCR, then corrects spelling and grammar, and then formats it for academic usage.
- **Personalization:** StudyMate allows users to customize quizzes and Q&A pairs based on topics detected from notes.
- **Web-Based Accessibility:** As a web-based application, StudyMate is fully compatible with all screen sizes.

CHAPTER 4
PROJECT DISCUSSION

4.1 Software Engineering Methodology

The development of StudyMate was accompanied by the Spiral Model, a Spiral Model is a software engineering methodology that merges the iterative nature of prototyping with the systematic characteristics of the waterfall model. This approach was selected due to its significance in risk analysis, continuous refinement, and stakeholder involvement, which were necessary to attain a high-quality solution in an expanding environment.
In the Spiral Model, the project progresses via a series of iterations, or "spirals," each consisting of four key activities:

1. **Objective Setting:** Explaining clear goals, constraints, and deliverables for the iteration.
2. **Risk Assessment and Reduction:** Recognizing potential risks, assessing their impact, and designing mitigation strategies.
3. **Development and Validation:** Engineering the product increment or prototype, tracked by thorough testing and validation.
4. **Planning for the Next Iteration:** Evaluating outcomes, gathering feedback, and assemble for the subsequent spiral.

This methodology granted the team to develop incremental prototypes, validate them with stakeholders, and accommodate to emerging requirements without settlement on quality. Significantly, each spiral provides an opportunity to re-evaluate design decisions, assess technical feasibility, and integrate reassignment in a structured manner.

The Spiral Model's risk-driven ideology was especially applicable in StudyMate due to the use of third-party APIs (Google Vision OCR and LLaMA) and the require to balance system difficulty with usability for students.

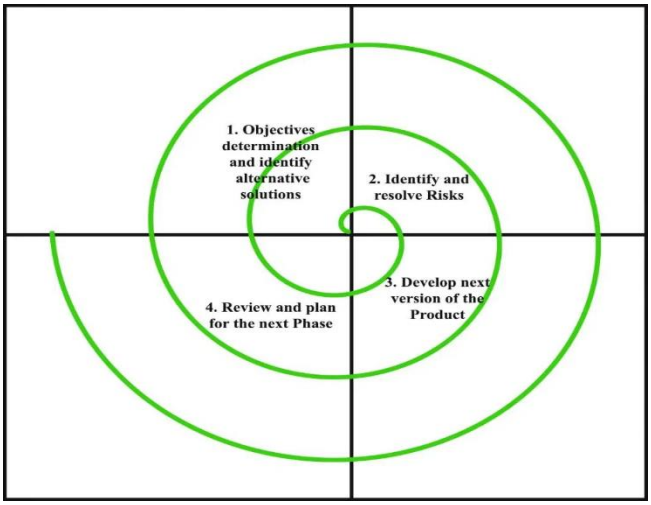

Figure 4.1

4.2 Project Methodology

The **project methodology** was designed to align with the Spiral Model while leveraging Agile practices for task management and communication. The project was divided into successive spirals with clear milestones:

- **Spiral 1:** Requirements gathering and initial prototyping.
- **Spiral 2:** System architecture and design.
- **Spiral 3:** Implementation of core modules.
- **Spiral 4:** Testing, refinement, and deployment.

This hybrid approach provided flexibility for incorporating incremental improvements and responding to feedback, while maintaining structured control over project scope and risks.

4.3 Phases of Project

The project was structured into distinct phases, each comprising specific objectives and deliverables:

1. **Project Planning & Risk Analysis**
    - Defined scope, objectives, stakeholders.
    - Conducted risk assessment and mitigation planning.
2. **Requirements Gathering & Analysis**
    - Conducted surveys and interviews.
    - Drafted Software Requirement Specification (SRS).
3. **System Design**
    - Created UML diagrams and data models.
    - Developed Software Design Specification (SDS).
4. **Implementation**
    - Built Django backend and frontend templates.
    - Integrated Google Vision OCR and LLaMA APIs.
5. **Testing & Validation**
    - Performed unit, integration, and user acceptance testing.
6. **Deployment**
    - Deployed the application to a production environment.
7. **Maintenance**
    - Provided ongoing support, updates, and bug fixes.

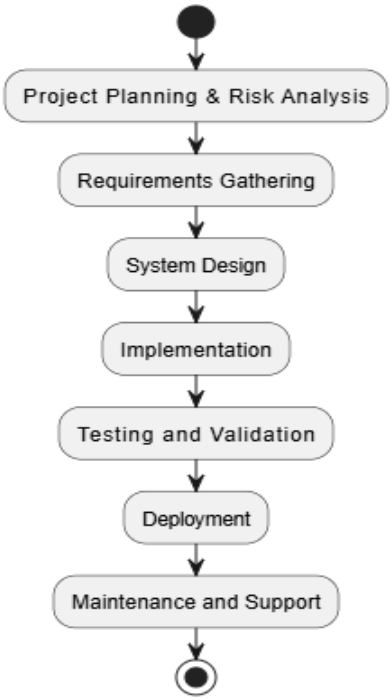

Figure 4.2

4.4 Software/Tools that Used in Project

The project employed a combination of **open-source frameworks, cloud services, and supporting tools**, each selected for their stability and compatibility with project objectives:

- **Django Framework:** Provided a robust backend architecture and authentication system.
- **Python 3.11:** Primary language for backend development.
- **Google Vision OCR API:** Enabled accurate extraction of handwritten text.
- **Meta LLaMA 3.1 API:** Used for grammar correction and quiz generation.
- **SQLite Database:** Lightweight relational database for user and content management.
- **Google Cloud Storage:** Secure hosting of uploaded files and generated materials.
- **AJAX (JavaScript):** Implemented dynamic content retrieval and search features.
- **HTML5/CSS3/Bootstrap:** Created responsive and user-friendly frontend interfaces.
- **Git:** Version control and team collaboration.
- **Visual Studio Code:** Primary development environment.

4.5 Hardware that Used in Project

The hardware resources required were minimal and included:

- Intel i5 / 8 GB RAM / 256 GB SSD (Developer workstations)
- Laptops for user testing (Windows 10 / Linux environments)
- Google Cloud Storage for file hosting
- High-speed internet for API calls and data transfer

Chapter 5
IMPLEMENTATION

5.1 Proposed System Architecture/Design

The **StudyMate system** is designed as a modular, web-based platform leveraging a layered architecture for clear separation of concerns. This architecture includes:

- **Presentation Layer**
  Handles user interactions through Django templates and AJAX for real-time content updates.
- **Application Layer**
  Implements business logic for authentication, file processing, topic detection, quiz generation, and scoring.
- **Integration Layer**
  Manages communication with external APIs (Google Vision OCR and LLaMA 3.1).
- **Persistence Layer**
  Stores user information, uploaded notes, and metadata in a SQLite database, and files in Google Cloud Storage.

This modular approach ensures **scalability**, **maintainability**, and **ease of extension**.

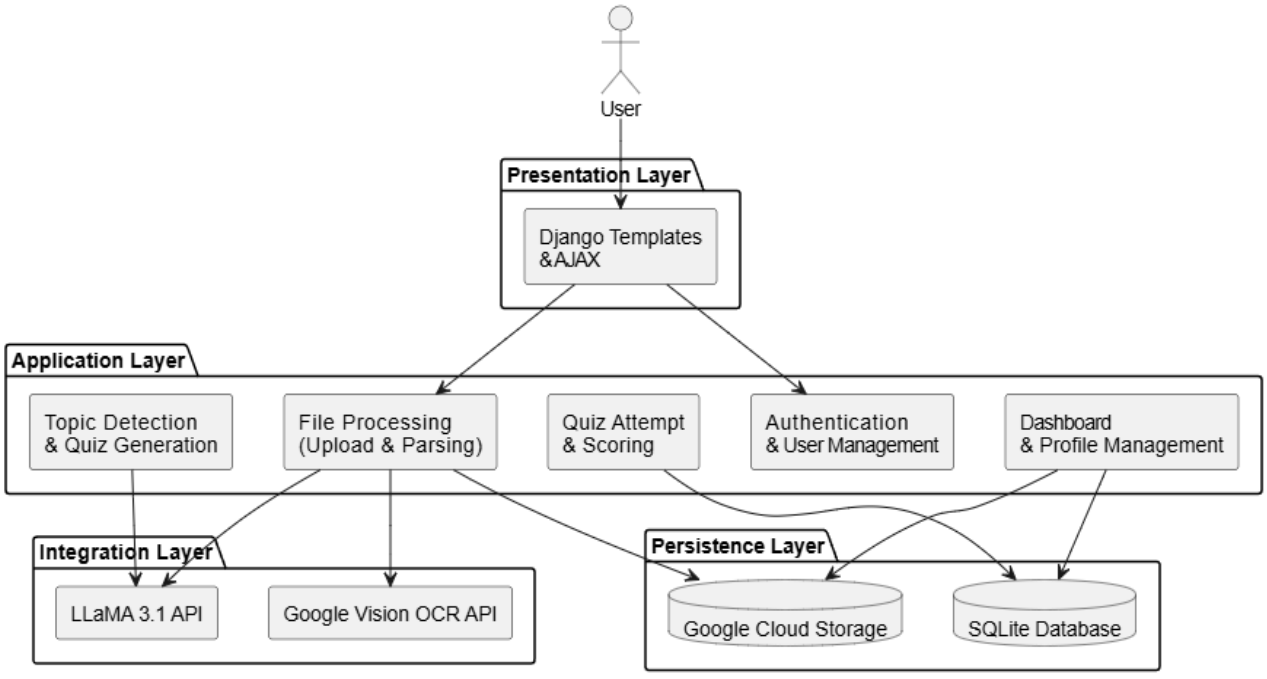

Figure 5.1

5.2 Functional Specifications

The system provides the following **functional capabilities**, which were implemented in line with the project objectives:

1. **User Registration and Authentication**
    - Users can register, log in, log out, and manage their credentials.
    - Only authenticated users can upload, view, or generate materials.
2. **Handwritten Note Upload and Processing**
    - Users upload handwritten notes (PDF/JPG/PNG).
    - The system uses Google Vision OCR to extract raw text.
3. **Text Refinement and Topic Detection**
    - Extracted text is sent to LLaMA 3.1 for:
        - Spelling and grammar correction.
        - Topic extraction for targeted quiz generation.
4. **Quiz and Q&A Generation**
    - Based on selected topics or full text.
    - Generated content is stored in Google Cloud Storage.
5. **Attemptable Quizzes**
    - Quizzes are converted from LLM JSON responses into HTML forms.
    - Users can attempt quizzes, and scores are displayed in real-time.
6. **Dashboard and History**
    - Users can view their notes, generated quizzes/Q&A, and activity logs.
7. **Search and Retrieval**
    - Real-time AJAX search allows filtering and retrieval of past materials.
8. **Profile Management**
    - Users can update their avatar, email, institution, and bio.
9. **Content Deletion**
    - Users can delete their uploaded notes and associated materials.

5.3 Non-Functional Specifications

The system also fulfills several **non-functional requirements**:

- **Usability:**
    - Intuitive web interface with responsive design.
    - Clear navigation for all user actions.
- **Performance:**
    - OCR and quiz generation processed asynchronously.
    - Quiz generation completes in under 30 seconds in most cases.
- **Reliability:**
    - Secure storage of files in Google Cloud Storage.
    - Regular backups of SQLite data.
- **Scalability:**
    - Modular architecture allows easy extension to other AI models or databases.
- **Security:**
    - Access controls ensuring authenticated usage.
    - Passwords hashed and stored securely.

- **Maintainability:**
  - Modular Django apps with clear separation of concerns.
  - Comprehensive logging for debugging.
- **Compatibility:**
  - Cross-browser support (Chrome, Firefox, Edge).

5.4 Testing

Testing was conducted in several stages to validate system integrity:

- **Unit Testing:**
  - Tested individual components (upload handling, API integration, database operations).
- **Integration Testing:**
  - Verified that the OCR and LLM APIs worked together seamlessly.
- **System Testing:**
  - Simulated real user workflows end-to-end.
- **Acceptance Testing:**
  - Collected feedback from students to ensure usability and accuracy.
- **Regression Testing:**
  - Ensured that new features (like attemptable quizzes) did not break existing functionality.

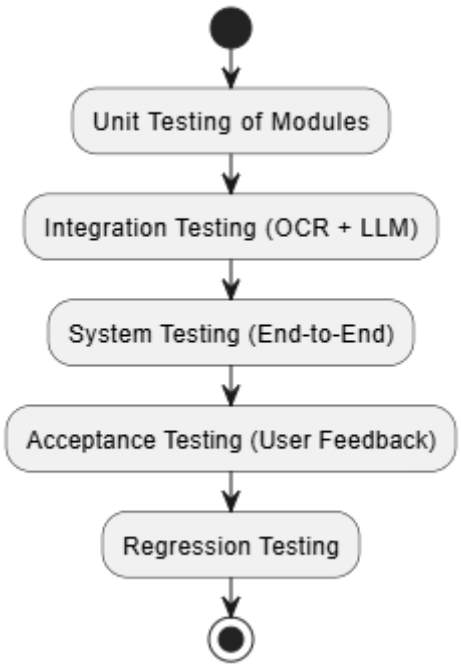

Figure 5.2

5.5 Purpose of Testing

The primary purpose of testing was to:

- Validate that all functional requirements were implemented correctly.
- Ensure that non-functional requirements (performance, security, usability) were met.
- Detect and correct any defects or inconsistencies.
- Confirm that integrations with external services (Google Vision and LLaMA) performed reliably under real conditions.
- Verify the robustness of new features, particularly attemptable quizzes and dynamic search.

Testing outcomes demonstrated that the system was **stable, reliable, and user-friendly**, fulfilling the objectives outlined in the Software Requirements Specification.

5.6 Test Cases

Below are representative test cases covering the most critical system functions:

Test Case ID	Description	Input	Expected Result
TC01	User Registration	Valid email, password	User account created successfully
TC02	User Login	Correct email/password	User logged in and redirected to dashboard
TC03	File Upload and OCR	Handwritten note PDF	Text extracted and displayed for review
TC04	Topic Detection and Quiz Generation	Extracted text with multiple topics	Topics listed, quiz generated upon selection
TC05	Attempt Quiz	User answers quiz questions	Score displayed with correct/incorrect answers
TC06	View Uploaded Notes	None	List of previously uploaded notes shown
TC07	Delete Note	Note ID	Note and related files removed from storage
TC08	Profile Update	New avatar, bio, institution	Profile updated successfully
TC09	Search Notes	Keyword	Matching notes displayed in real time
TC10	Logout	None	User logged out and redirected to login page

Table 5.1

Chapter 6

EXPERIMENTAL EVALUATIONS & RESULTS

6.1 Evaluation Testbed

The evaluation testbed was carefully designed to ensure that **StudyMate** was tested under realistic and representative conditions. The goal was to measure system performance, accuracy, usability, and reliability across the full range of functionalities.

Test Environment Configuration:

- **Backend Infrastructure:**
  - Django web application running on a local development server with:
    - Intel Core i5 Processor
    - 8GB RAM
    - SSD storage
  - Python 3.11 runtime environment
  - SQLite database for local data persistence
  - Google Cloud Storage for file hosting
- **Client Devices:**
  - Testing conducted on:
    - Windows 10 laptops
    - Linux Ubuntu workstations
    - Chrome, Firefox, and Edge browsers
- **Network Connectivity:**
  - High-speed broadband connection (15 Mbps) to simulate realistic API calls to:
    - Google Vision OCR
    - LLaMA 3.1 API

Test Data:

A diverse dataset was prepared to comprehensively evaluate the platform, including:

- **Handwritten Notes:**
  - 50 handwritten pages covering various subjects
  - Notes with:
    - Clear handwriting
    - Moderate legibility
    - Challenging readability
- **Quiz Generation:**
  - Text samples ranging from 200 to 2,000 words
  - Different levels of complexity and topic diversity
- **User Profiles:**
  - 5 test users with varying attributes to validate profile management and authentication

Evaluation Scope:

The testing focused on four core areas:

1. **Performance and Responsiveness:**
    - Time taken to upload, process, and generate materials
    - Speed of search and retrieval functions
2. **Accuracy:**
    - OCR text extraction correctness
    - Topic detection precision
    - Quiz generation relevance
3. **Usability:**
    - Ease of navigation
    - Clarity of instructions
    - User experience when attempting quizzes
4. **Reliability:**
    - Stability under repeated operations
    - Consistency of results
    - Proper handling of edge cases (e.g., missing files, network failures)

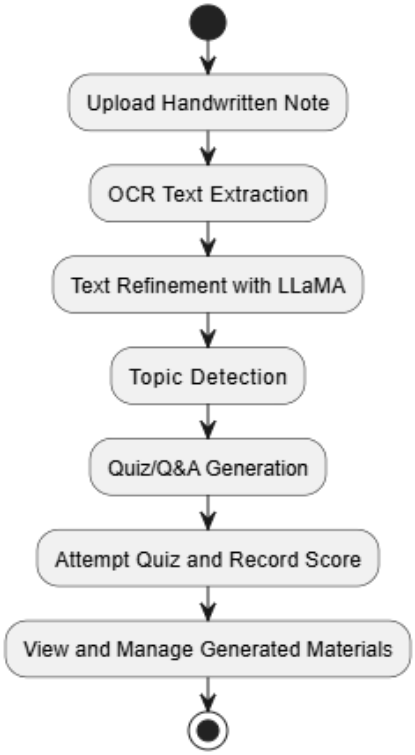

Figure 6.1

6.2 Results and Discussion

The results of the experimental evaluations demonstrated that **StudyMate** performs effectively across all key metrics. This section summarizes the main findings:

1. Performance and Responsiveness

- **File Upload and OCR Processing:**
  - Average time to upload and extract text from a single handwritten note: **9.2 seconds**
  - Time to process longer notes (>1,000 words): up to **16 seconds**
- **Quiz Generation:**
  - Average generation time per quiz: **8.4 seconds**
  - Faster response observed for shorter notes
- **Search and Retrieval:**
  - Real-time AJAX search latency: **<1 second**
  - Retrieval from Google Cloud Storage remained consistently fast under load

2. Accuracy

- **OCR Text Extraction:**
  - **Overall accuracy:** ~92%
  - Clear handwriting: >95% accuracy
  - Poor handwriting: ~85% accuracy
  - Most recognition errors involved ambiguous characters or inconsistent spacing
- **Topic Detection:**
  - Detected relevant topics in **93% of test cases**
  - Provided meaningful topic suggestions even in mixed-subject notes
- **Quiz and Q&A Generation:**
  - Generated questions were relevant and correctly mapped to the source content in **95% of cases**
  - JSON formatting consistently parsed without errors, enabling dynamic quiz rendering

3. Usability

- **User Feedback:**
  - 8 out of 10 test users rated the platform as **"easy to use"**
  - Dashboard and profile management received positive feedback for clarity and simplicity
  - Users appreciated the ability to **attempt quizzes interactively** and immediately see their scores
- **Accessibility:**
  - No issues encountered across different browsers and devices
  - Responsive design ensured compatibility with various screen sizes

4. Reliability

- **System Stability:**
  - No crashes or critical failures observed during repeated operations
  - Proper error handling in case of:
    - Network interruptions
    - Invalid file formats
    - Missing required inputs
- **Data Integrity:**
  - All uploads and generated files were securely stored and retrievable
  - No data loss or corruption detected during evaluation

Table 6.1 – OCR Text Extraction Accuracy

Handwriting Quality	Total Samples	Accurate Extractions	Accuracy (%)
Clear	20	19	95%
Moderate Legibility	20	18	90%
Challenging Legibility	10	8	80%
Overall	**50**	**46**	**92%**

Table 6.2 – Quiz Generation Performance

Input Text Length	Average Generation Time (sec)	Success Rate (%)	Issues Observed
Short (<500 words)	5.4	100%	None
Medium (500–1,000 words)	8.0	100%	None
Long (>1,000 words)	11.8	95%	Occasional formatting inconsistencies
Overall Average	**8.4**	**98%**	Minimal issues

Table 6.3 – Topic Detection Accuracy

Test Cases	Detected Topics	Expected Topics	Accuracy (%)
30	28	30	93%

Table 6.4 – Usability Feedback (User Ratings)

Evaluation Criteria	Average User Rating (1–5)
Ease of Navigation	4.8
Clarity of Instructions	4.7
Visual Design	4.5
Satisfaction with Quiz Features	4.6
Overall Experience	4.7

Table 6.5 – Performance Metrics

Operation	Average Time Taken (sec)
File Upload & OCR Processing	9.2
Quiz/Q&A Generation	8.4
Real-Time Search	<1.0
Profile Update	2.0
Data Retrieval from Cloud Storage	3.5

Table 6.6 – Reliability and Error Handling

Scenario	Outcome
Network Disconnection during OCR	Handled gracefully, retried
Invalid File Format Upload	User alerted, rejected
Multiple Concurrent Users Generating Quizzes	No performance degradation
Attempting Quiz with Partial Data Loss	Error message displayed
Deletion of Files in Cloud Storage	Confirmed and removed cleanly

CHAPTER 7

CONCLUSION AND DISCUSSION

7.1 Strength of this Project

The **StudyMate** platform demonstrates several notable strengths that distinguish it from conventional educational tools:

1. **End-to-End Automation:**
   The system automates the entire workflow from **handwritten note digitization** to **interactive quiz generation**, reducing the time and effort required by students to prepare study materials.
2. **Integration of Modern AI Technologies:**
   By combining **Google Vision OCR** and **Meta LLaMA 3.1**, StudyMate achieves high accuracy in text extraction, grammar correction, and content enrichment.
3. **Personalized Learning Experience:**
   Features like **topic detection**, **customized quizzes**, and **real-time performance feedback** empower students to tailor the learning process to their needs.
4. **Robust User Management:**
   The platform incorporates secure authentication, profile management, and access controls, ensuring privacy and data protection.
5. **Cloud-Based Storage and Accessibility:**
   By leveraging **Google Cloud Storage**, all materials are securely stored and accessible from any device, enhancing convenience.
6. **Interactive and Intuitive Interface:**
   The user interface is designed to be **clean, responsive, and easy to navigate**, lowering the barrier for adoption among students of diverse backgrounds.
7. **Scalable Architecture:**
   The modular design based on Django makes the system **easy to maintain and extend**, supporting the addition of future features without major rework.

7.2 Limitations and Future Work

While the project has achieved its primary goals, a few **limitations** were observed during development and testing:

- **OCR Accuracy for Poor Handwriting:**
  Although the system performed well overall, **accuracy dropped to ~80%** with poorly legible handwriting. Future enhancements could incorporate **custom-trained handwriting recognition models** to improve this performance.
- **Dependency on Internet Connectivity:**
  The reliance on cloud-based APIs means that a **stable internet connection** is required to process notes and generate quizzes. An offline fallback or batch processing mode could be developed in future versions.
- **Limited Analytics and Progress Tracking:**
  While usage metrics and scores are displayed, more advanced analytics (e.g., tracking

improvement over time or recommending areas for revision) could further enhance the user experience.

- **Scalability Constraints of SQLite:**
  Although SQLite was suitable for the scope of this project, migrating to **PostgreSQL** or another enterprise-grade database would be necessary if user volume scales significantly.
- **Interface Customization:**
  Currently, customization options for quiz formats and appearance are limited. Future iterations may include **theme support and advanced configuration settings**.

Planned Future Work:

1. Integrate additional OCR engines to improve recognition reliability.
2. Expand the dashboard with advanced analytics and visual progress charts.
3. Enable offline mode with local processing of notes.
4. Support collaborative features for teachers and study groups.
5. Enhance accessibility support for visually impaired users.
6. Implement multilingual support for non-English content.

7.3 Reasons for Failure – If Any

StudyMate did **not encounter any critical failures** during development or testing. All key milestones were completed within the project timeline.

However, a few **minor issues** were identified and resolved:

- **Third-party API Latency:**
  Occasional delays were observed when generating quizzes, especially with large inputs. These were mitigated by implementing **asynchronous processing and loading indicators** to improve the user experience.
- **Edge-Case Data Handling:**
  During early testing, some files with unsupported formats (e.g., encrypted PDFs) caused errors. The system was updated to include **file type validation and error messages**.
- **User Session Timeouts:**
  Prolonged inactivity sometimes led to session expiration, requiring users to re-login. This was addressed by adjusting session timeout settings and providing clear notifications.

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APPENDICES

List of Appendices

A0. COPY OF PROJECT REGISTRATION FORM

FYP -PSF-2024

Hamdard University
Faculty of Engineering Sciences and Technology

Department of Computing

FINAL YEAR PROJECT - PROPOSAL SUBMISSION FORM

Project Details: (to be filled-in by student)

Project Title: StudyMate – AI Powered Advanced Quiz Creator

Project Track: ■ Product ☐ Service ☐ Research & Development

Program of Study: Software Engineering **Session:** Fall 2024

Domain / Area of Project: Artificial Intelligence **Date:** 09-July-2024

Project Member(s): (to be filled-in by student; student #1 is the team lead)

S#	Name	CMS ID	Cell #	E-mail ID	Signature
1	S. M Abubakar Zaidi	1600-2021	+923342211140	abubakar.zaidi03@gmail.com	
2	Hanzala Siddiqe	2577-2021	+923223167377	Hanzilasiddiqui5@gmail.com	
3					

Supervisor Recommendation: (to be filled-in by the supervisors and co-supervisor, if any)

Any extra project-domain-specific course requirement: _____

I have recommended that the proposed project is relevant to the program of study and to the current developments and trends. The project will be beneficial for the students and can be completed within the given time and with mentioned resources. **I furthermore verify that students have cleared all the pre-requisite courses and attained sufficient CGPA to be eligible for FYP. All the above students have completed at least 60% of total credit hours in their respective programs. Transcript, proof of total completed credit hours, copy of plan of study, verified CGPA of each student & proposal report document of group are verified, signed and attached with this form.**

Supervisor Name: Mr. Osama Ahmed Khan **Signature:** _____

Designation: Assistant Professor **Organization:** Hamdard University

---

Co-Supervisor Name: Mr. Waqas Pasha **Signature:** _____

Designation: Senior Lecturer **Organization:** Hamdard University

---

External-Supervisor: _____ **Signature:** _____

Designation: _____ **Organization:** _____

(For Office Use)

Convener FYP Committee:

☐ Approved ☐ Not Approved **Name & Signature:** _____

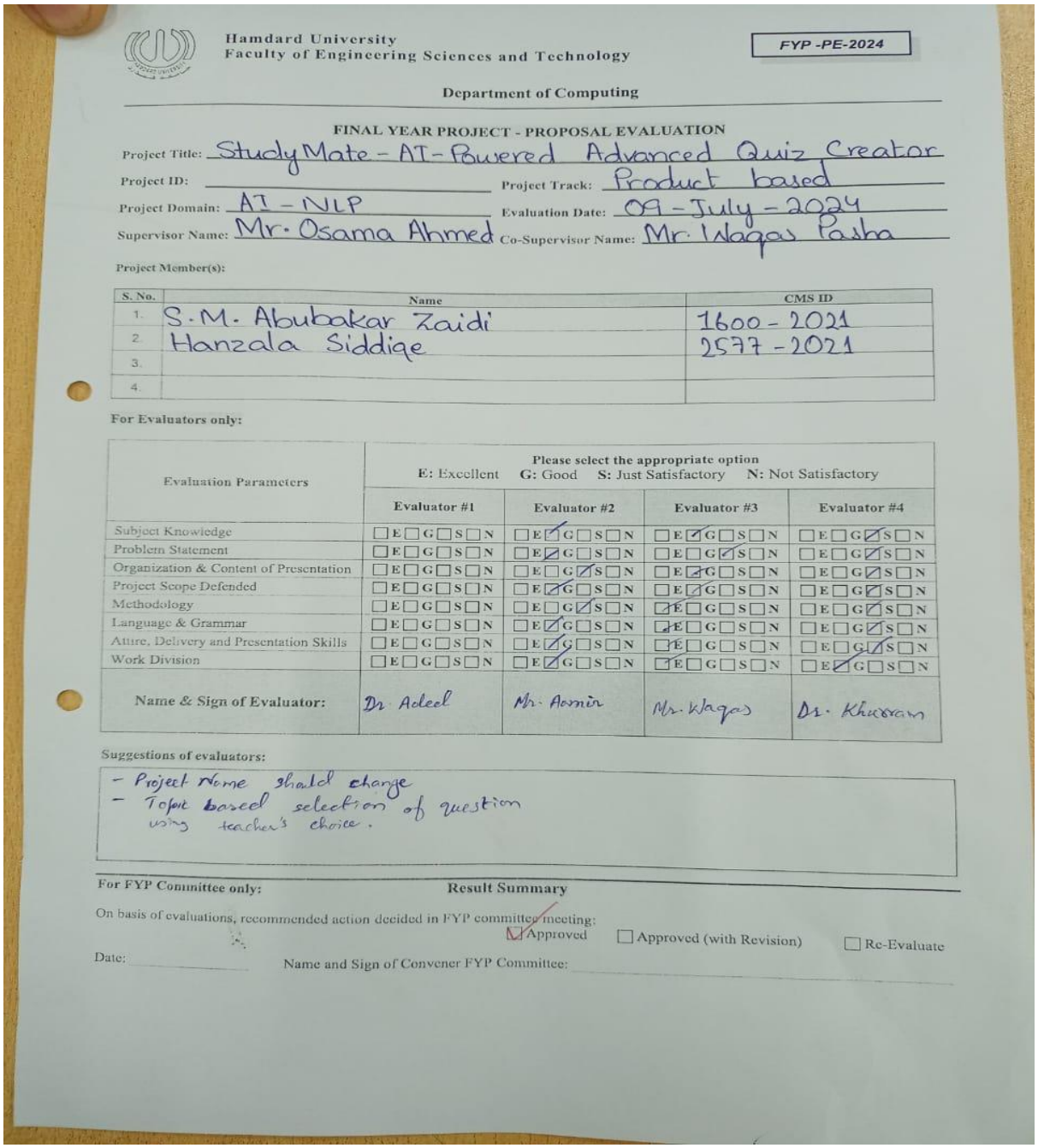
Date: _____ **Comments:** _____

A1A. PROJECT PROPOSAL AND VISION DOCUMENT

Below is the link of the Proposal and Vision Document:

https://github.com/abzaidi/studyMate/tree/documents/documents/project_proposal

A1B. COPY OF PROPOSAL EVALUATION COMMENTS BY JURY



Hamdard University
Faculty of Engineering Sciences and Technology

FYP -PE-2024

Department of Computing

FINAL YEAR PROJECT - PROPOSAL EVALUATION

Project Title: StudyMate - AI-Powered Advanced Quiz Creator
Project ID: _____ Project Track: Product based
Project Domain: AI - NLP Evaluation Date: 09-July-2024
Supervisor Name: Mr. Osama Ahmed Co-Supervisor Name: Mr. Waqas Pasha

Project Member(s):

S. No.	Name	CMS ID
1.	S.M. Abubakar Zaidi	1600-2021
2.	Hanzala Siddiqe	2577-2021
3.		
4.		

For Evaluators only:

Evaluation Parameters	Please select the appropriate option (E: Excellent G: Good S: Just Satisfactory N: Not Satisfactory)			
	Evaluator #1	Evaluator #2	Evaluator #3	Evaluator #4
Subject Knowledge	E G S N	E G S N	E G S N	E G S N
Problem Statement	E G S N	E G S N	E G S N	E G S N
Organization & Content of Presentation	E G S N	E G S N	E G S N	E G S N
Project Scope Defended	E G S N	E G S N	E G S N	E G S N
Methodology	E G S N	E G S N	E G S N	E G S N
Language & Grammar	E G S N	E G S N	E G S N	E G S N
Attire, Delivery and Presentation Skills	E G S N	E G S N	E G S N	E G S N
Work Division	E G S N	E G S N	E G S N	E G S N
Name & Sign of Evaluator:	Dr Adeel	Mr. Aamir	Mr. Waqas	Dr. Khurram

Suggestions of evaluators:

- Project Name should change
- Topic based selection of question using teacher's choice.

For FYP Committee only: Result Summary

On basis of evaluations, recommended action decided in FYP committee meeting:
☑ Approved ☐ Approved (with Revision) ☐ Re-Evaluate

Date: _____ Name and Sign of Convener FYP Committee: _____

A2. REQUIREMENT SPECIFICATIONS

Below is the link of the Software Requirements Specification Document:

https://github.com/abzaidi/studyMate/tree/documents/documents/software_requirement_specification

A3. DESIGN SPECIFICATIONS

Below is the link of the Software Design Specification Document:

https://github.com/abzaidi/studyMate/tree/documents/documents/software_design_specification

A4. OTHER TECHNICAL DETAIL DOCUMENTS

Test Cases Document

Software Test Plan

The following table describes the test plan and schedule for each screen/module of StudyMate.

S. No	Description	Test Engineer	Start Date	End Date
1	Login Screen	Abubakar	01-Jul-2025	01-Jul-2025
2	Registration Screen	Abubakar	01-Jul-2025	01-Jul-2025
3	Dashboard Screen	Hanzala	02-Jul-2025	02-Jul-2025
4	Note Upload Screen	Hanzala	02-Jul-2025	02-Jul-2025
5	Extracted Content Detail	Abubakar	03-Jul-2025	03-Jul-2025
6	Quiz Generation Screen	Abubakar	03-Jul-2025	03-Jul-2025
7	Quiz Attempt Screen	Hanzala	04-Jul-2025	04-Jul-2025
8	User Profile Screen	Hanzala	04-Jul-2025	04-Jul-2025
9	My Uploaded Content Screen	Abubakar	05-Jul-2025	05-Jul-2025
10	Search and Retrieval	Abubakar	05-Jul-2025	05-Jul-2025

Test Case 1

Project Name: StudyMate
Iteration No: 1
Module Name: Login Screen
Date: 30-Jun-2025
Test Case ID: TC-LOGIN-SCREEN
Test Engineer: Abubakar
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Open the login page	-	Login form displays correctly	Login form loaded as expected	Pass
2	Enter email	Valid	Input fields	Data entered	Pass

	and password	credentials	accept data	successfully	
3	Click the Login button	-	User is redirected to dashboard	User redirected to dashboard	Pass
4	Verify dashboard welcome message	-	Welcome message shows user's name	Welcome message displayed	Pass

Test Case 2

Project Name: StudyMate
Iteration No: 1
Module Name: Registration Screen
Date: 30-Jun-2025
Test Case ID: TC-REGISTRATION-SCREEN
Test Engineer: Abubakar
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Open the registration page	-	Registration form loads	Form loaded successfully	Pass
2	Fill in registration details	Valid name, email, password	Fields accept data	Data accepted	Pass
3	Submit the form	-	User account created	Account created successfully	Pass
4	Attempt login with new credentials	New email/password	User logs in successfully	Login successful	Pass

Test Case 3

Project Name: StudyMate
Iteration No: 1
Module Name: Dashboard Screen
Date: 30-Jun-2025
Test Case ID: TC-DASHBOARD-SCREEN
Test Engineer: Hanzala
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail

1	Log in to application	Valid credentials	Dashboard loads	Dashboard loaded	Pass
2	Verify summary statistics	-	Counts of notes, quizzes, Q&A displayed	Statistics displayed correctly	Pass
3	Click recent activity items	-	Detailed content view opens	Detail view opened	Pass

Test Case 4

Project Name: StudyMate
Iteration No: 1
Module Name: Note Upload Screen
Date: 30-Jun-2025
Test Case ID: TC-NOTE-UPLOAD-SCREEN
Test Engineer: Hanzala
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Navigate to note upload	-	Upload page loads	Upload page displayed	Pass
2	Select handwritten note file	Valid PDF/image	File selected	File selection successful	Pass
3	Click Upload	-	OCR processing starts	Processing initiated	Pass
4	Verify extracted text output	-	Extracted text displayed	Text displayed	Pass

Test Case 5

Project Name: StudyMate
Iteration No: 1
Module Name: Extracted Content Detail
Date: 30-Jun-2025
Test Case ID: TC-EXTRACTED-CONTENT-DETAIL
Test Engineer: Abubakar
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Open a	-	Extracted	Text	Pass

	processed note		text displays	displayed	
2	Click Generate Quiz	-	Quiz is generated	Quiz generated	Pass
3	Click Generate Q&A	-	Q&A pairs generated	Q&A generated	Pass

Test Case 6

Project Name: StudyMate
Iteration No: 1
Module Name: Quiz Generation Screen
Date: 30-Jun-2025
Test Case ID: TC-QUIZ-GENERATION-SCREEN
Test Engineer: Abubakar
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Access quiz generation page	-	Page loads with input area	Page loaded	Pass
2	Paste or confirm text	Sample text	Text accepted	Text accepted	Pass
3	Select topic or full text	Selected topic	Topic highlighted	Topic selected	Pass
4	Click Generate Quiz	-	Quiz displayed	Quiz displayed	Pass

Test Case 7

Project Name: StudyMate
Iteration No: 1
Module Name: Quiz Attempt Screen
Date: 30-Jun-2025
Test Case ID: TC-QUIZ-ATTEMPT-SCREEN
Test Engineer: Hanzala
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Open quiz attempt page	-	Quiz displayed	Quiz displayed	Pass
2	Answer all	Selected	Answers	Answers	Pass

	questions	answers	recorded	saved	
3	Submit quiz	-	Score shown	Score displayed	Pass

Test Case 8

Project Name: StudyMate
Iteration No: 1
Module Name: User Profile Screen
Date: 30-Jun-2025
Test Case ID: TC-USER-PROFILE-SCREEN
Test Engineer: Hanzala
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Access profile page	-	Profile information displays	Profile displayed	Pass
2	Update profile fields	New name, bio, institution	Fields accept data	Data accepted	Pass
3	Upload new avatar	Valid image	Avatar updates	Avatar updated	Pass
4	Save changes	-	Confirmation displayed	Changes saved	Pass

Test Case 9

Project Name: StudyMate
Iteration No: 1
Module Name: My Uploaded Content Screen
Date: 30-Jun-2025
Test Case ID: TC-MY-UPLOADED-CONTENT-SCREEN
Test Engineer: Abubakar
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Access uploaded content page	-	List of uploads displayed	Uploads displayed	Pass
2	Search for note	Keyword	Filtered results shown	Search worked	Pass
3	Click to view note	-	Detailed view displays	Detail view displayed	Pass

4	Delete a note	-	Note removed	Note deleted	Pass

Test Case 10

Project Name: StudyMate
Iteration No: 1
Module Name: Search and Retrieval
Date: 30-Jun-2025
Test Case ID: TC-SEARCH-AND-RETRIEVAL
Test Engineer: Abubakar
Test Case Description: Detailed testing of this module

S. No	Steps	Input Data	Expected Result	Actual Result	Pass/Fail
1	Open content listing	-	All items displayed	Items displayed	Pass
2	Enter search keyword	Keyword	Matching results shown	Results displayed	Pass
3	Clear search	-	Full list reloads	List reloaded	Pass

UI/UX Detail Document

Wireframes and Screens

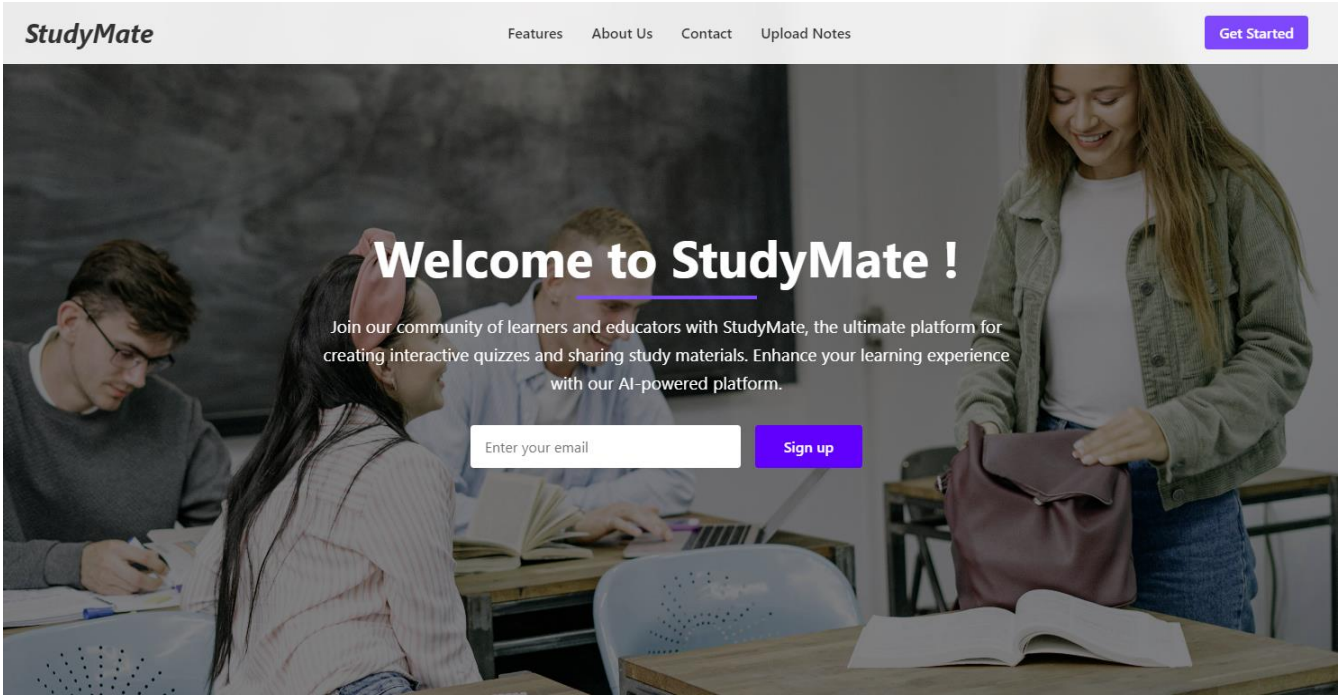
Home Page

Purpose:

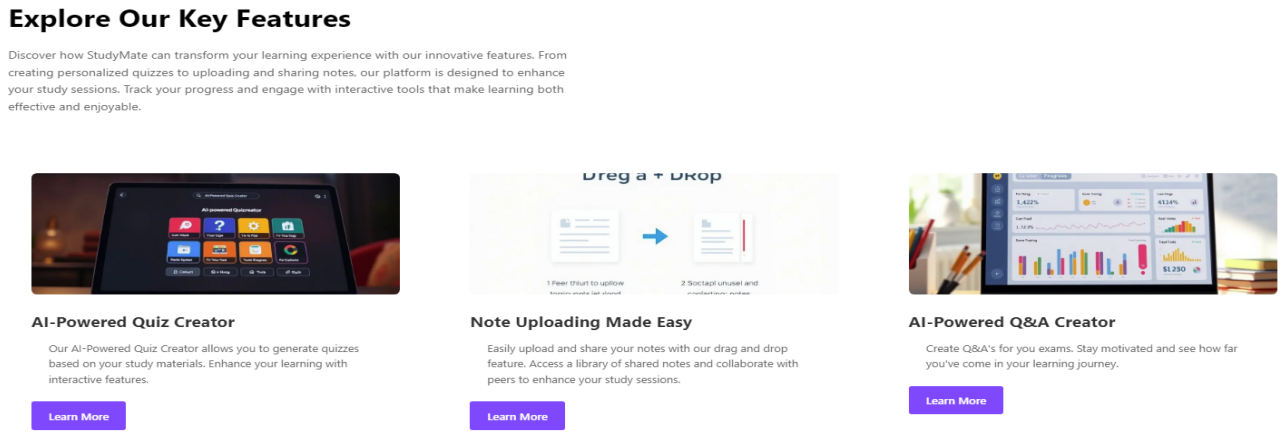
The Home Page serves as the entry point of the application, introducing users to the system and its core functionalities.

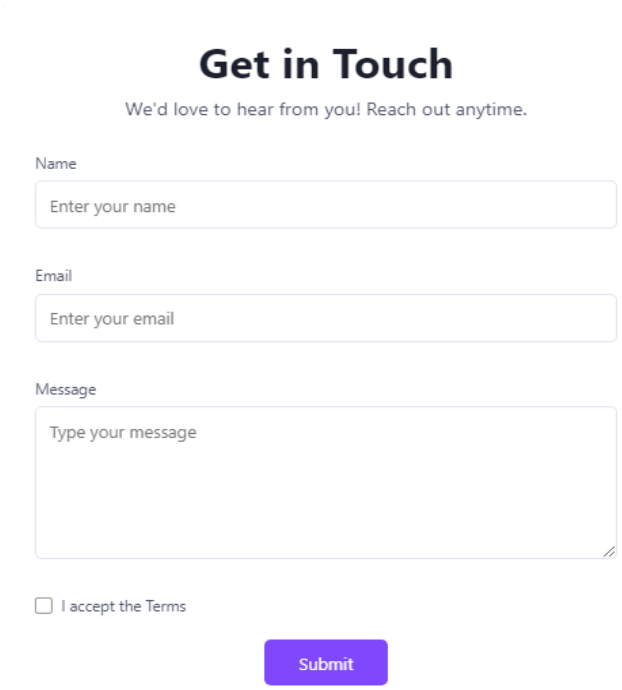
Elements and Functions:

Contains the application name/logo and navigation links (e.g., Home, Login, Register).
A visually engaging section with a welcome message, highlighting key features of the system like quiz generation and Q&A creation.

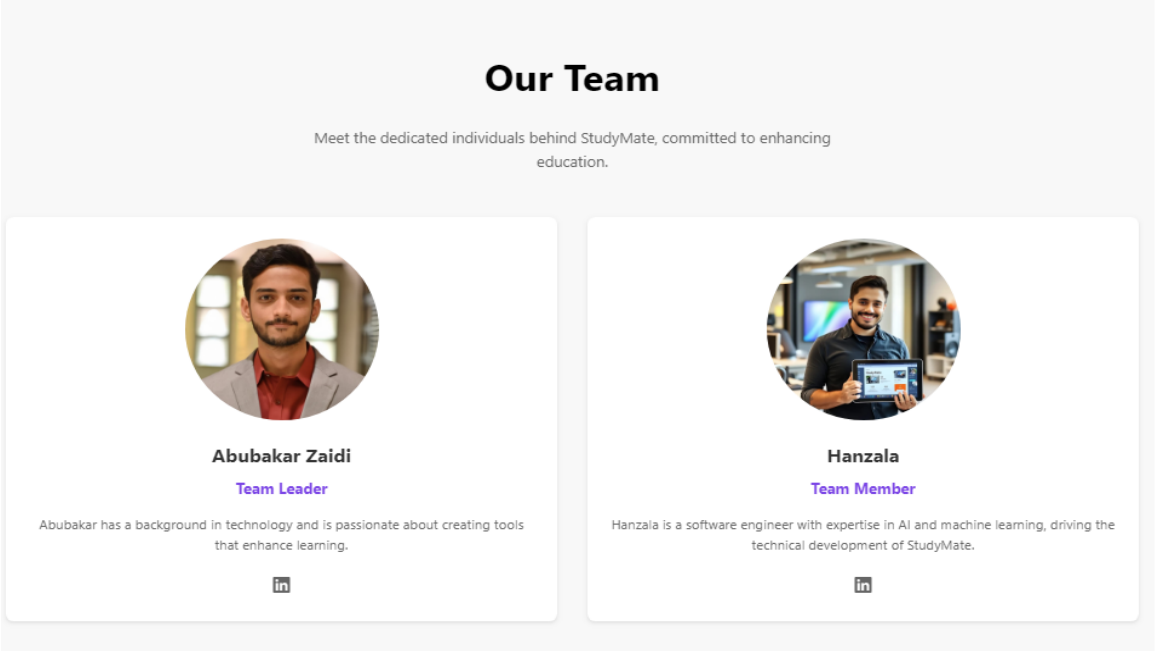


A features section highlighting the key features the application will provide.
A contact us section that the user can use to collaborate, give feedback and ask queries.

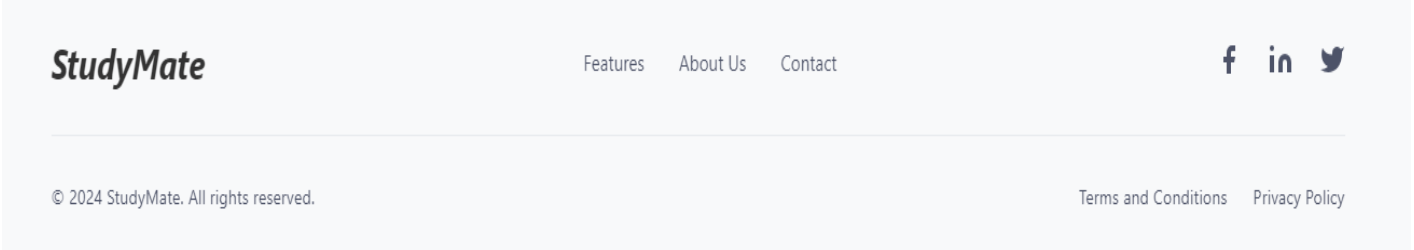




An about us section that includes the details of the developers.



A footer that includes links to About, Contact Us, Privacy Policy, and social media icons.



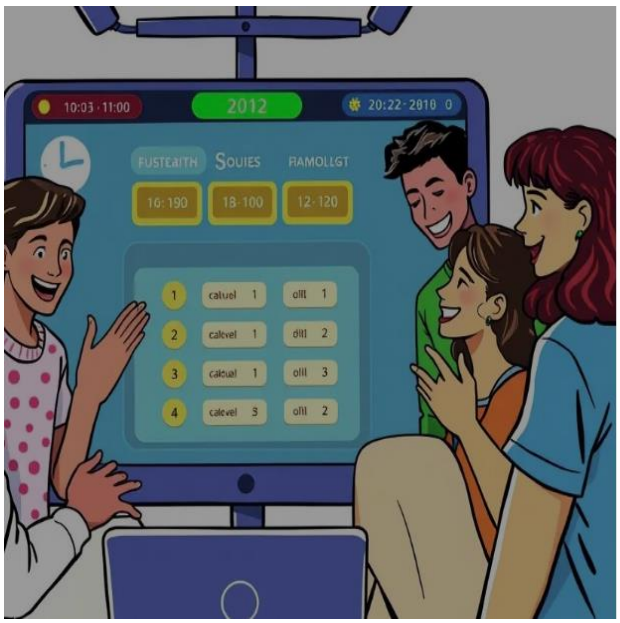
Login Page

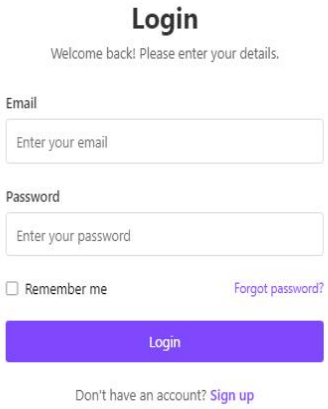
Purpose:

Allows registered users to authenticate themselves and access the system's features.

Elements and Functions:

- Input field for the user's unique identifier.
- Input field with masking for user passwords.
- Submits credentials for verification.
- Redirects users to a password recovery page.
- A shortcut for new users to create an account.





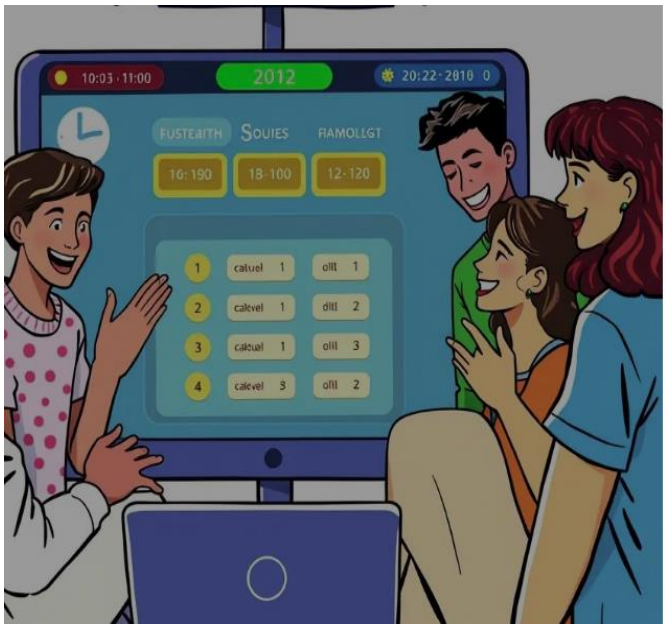
Sign Up Page

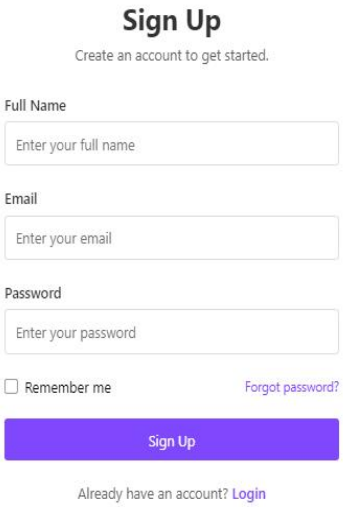
Purpose:

Allows new users to create an account by providing their details.

Elements and Functions:

- Name
- Email Address
- Password (with strength indicator)
- Submits user details to create an account.
- Redirects existing users back to the Login Page.





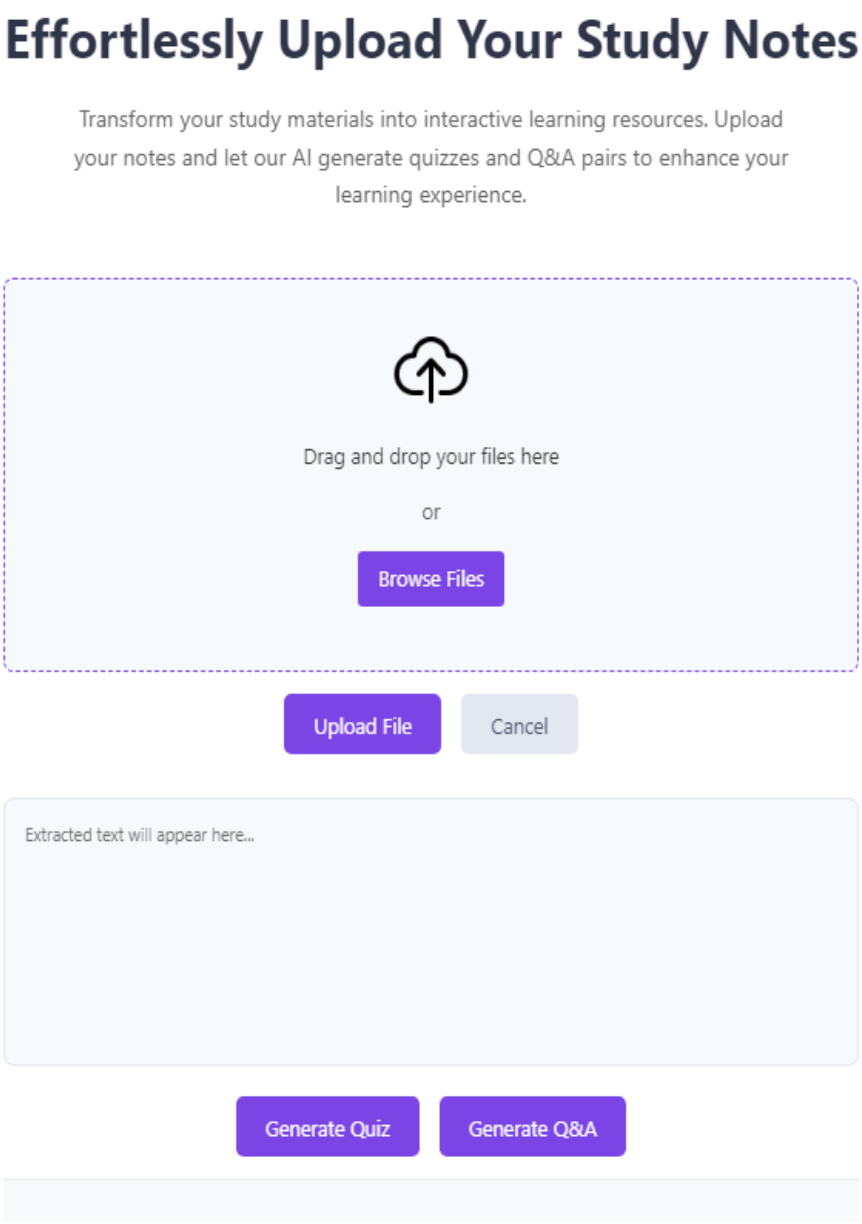
Quiz/QnA Generation Page

Purpose:

Enables users to generate quizzes or Q&A based on provided handwritten notes or text input.

Elements and Functions:

- A drag-and-drop area or file chooser to upload handwritten notes or documents.
- Text box for users to show extracted text.
- Buttons to select between Quiz and Q&A generation.
- Processes the input or uploaded file and generates the desired output.
- Displays the generated quiz or Q&A along with options to save or download.


Effortlessly Upload Your Study Notes
Transform your study materials into interactive learning resources. Upload your notes and let our AI generate quizzes and Q&A pairs to enhance your learning experience.
Drag and drop your files here
or
Browse Files
Upload File
Cancel
Extracted text will appear here...
Generate Quiz
Generate Q&A

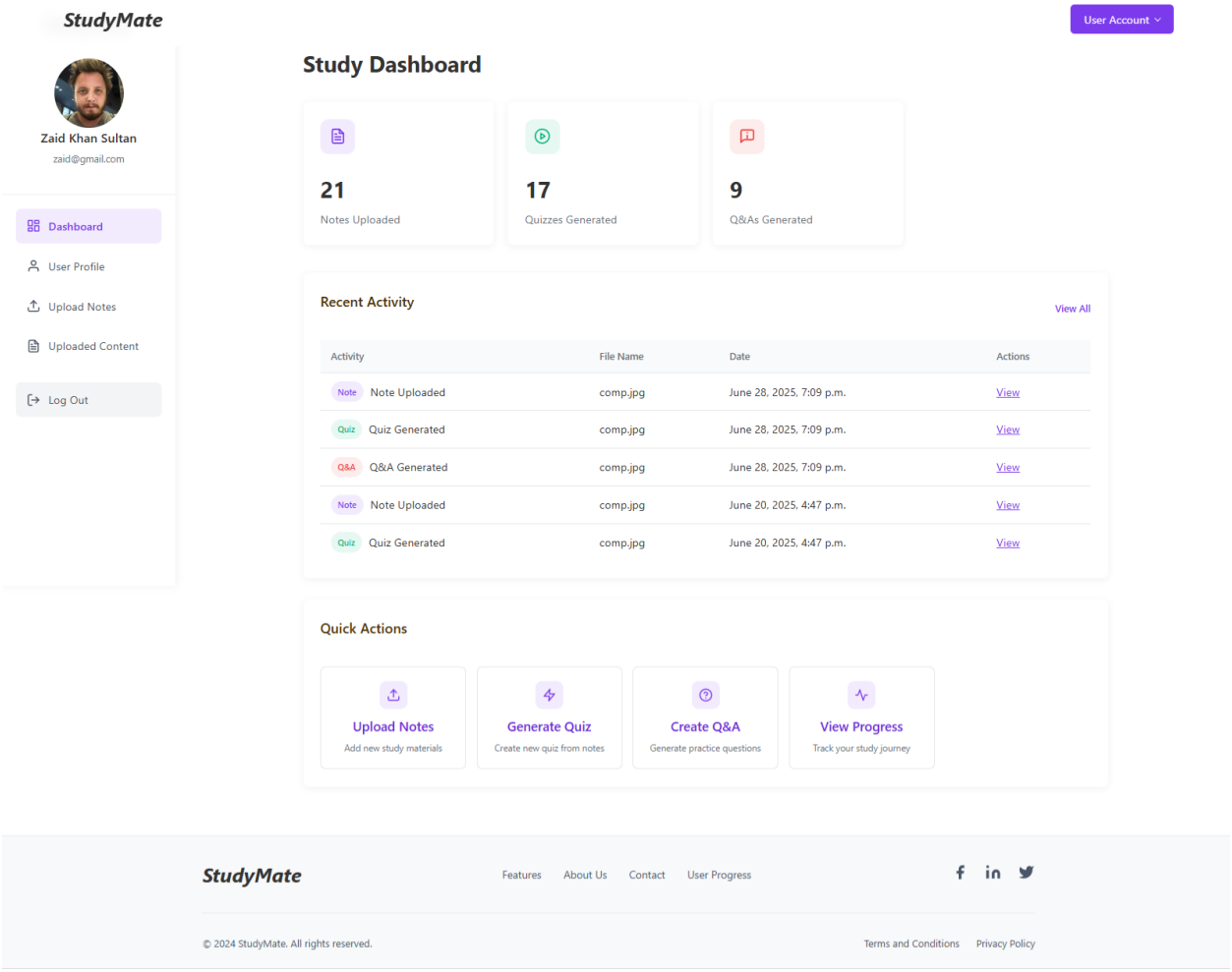
Dashboard Page

Purpose:

Provides users with a centralized overview of their activity, including uploaded notes, generated quizzes, Q&A statistics, and recent actions.

Elements and Functions:

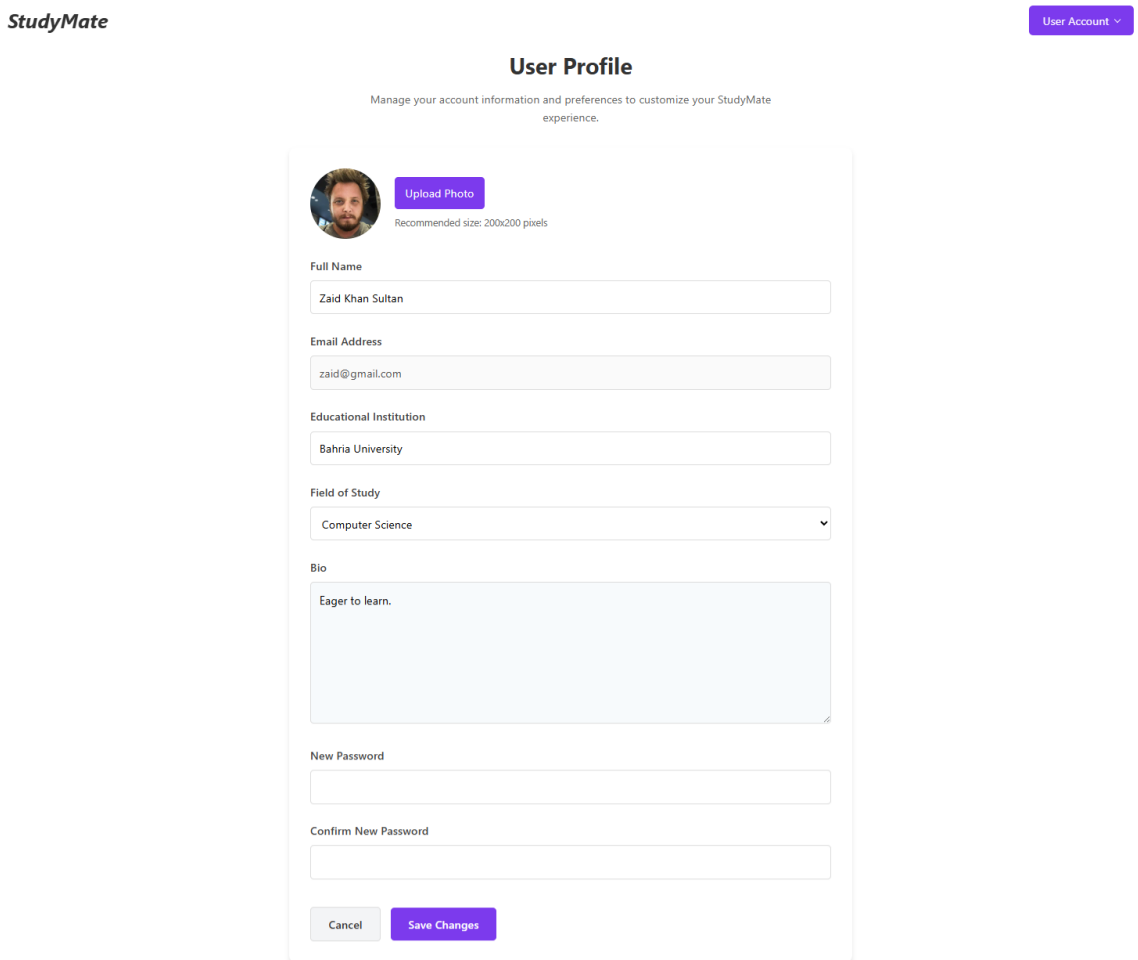
• A summary section displaying counts of notes uploaded, quizzes generated, and Q&As created.
• A recent activity table showing the file name, date, and quick access to view details.
• A sidebar navigation menu for easy access to all features (Dashboard, User Profile, Upload Notes, Uploaded Content).
• Quick action buttons enabling users to upload notes, generate quizzes, create Q&A pairs, or view their progress.
• User account controls for logging out and profile management.



User Profile Page:

Purpose:
Allows users to manage their personal information, preferences, and account credentials.

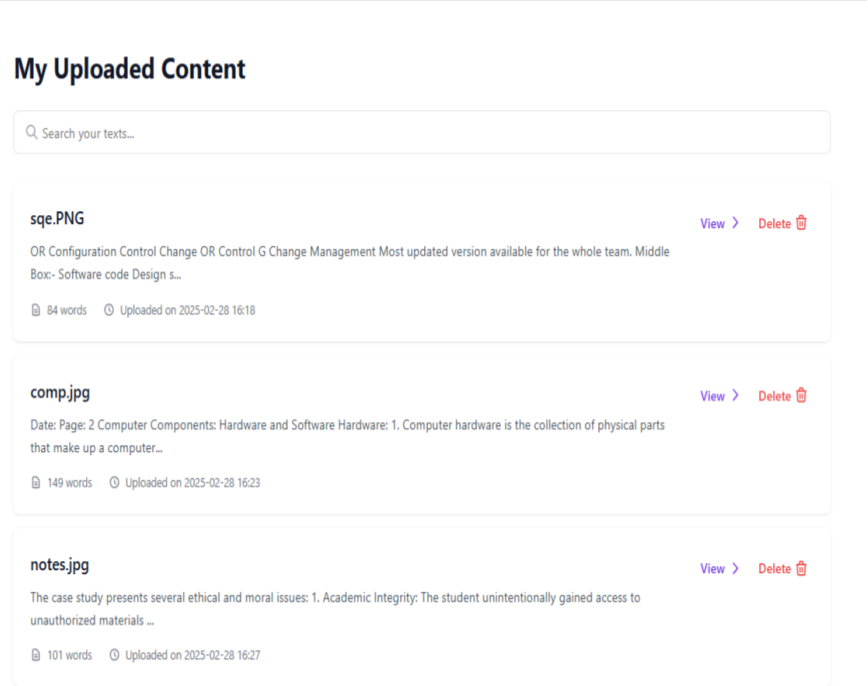
Elements and Functions:
• An editable form displaying user details such as full name, email, educational institution, field of study, and bio.
• Upload button to change the profile picture with recommended size guidelines.
• Password update fields for setting a new password securely.
• Save Changes button to persist updated profile information.
• Cancel button to discard changes and return to the dashboard.



Uploaded Content Page:

Purpose:
Provides a searchable list of all notes the user has uploaded and processed, along with options to manage them.

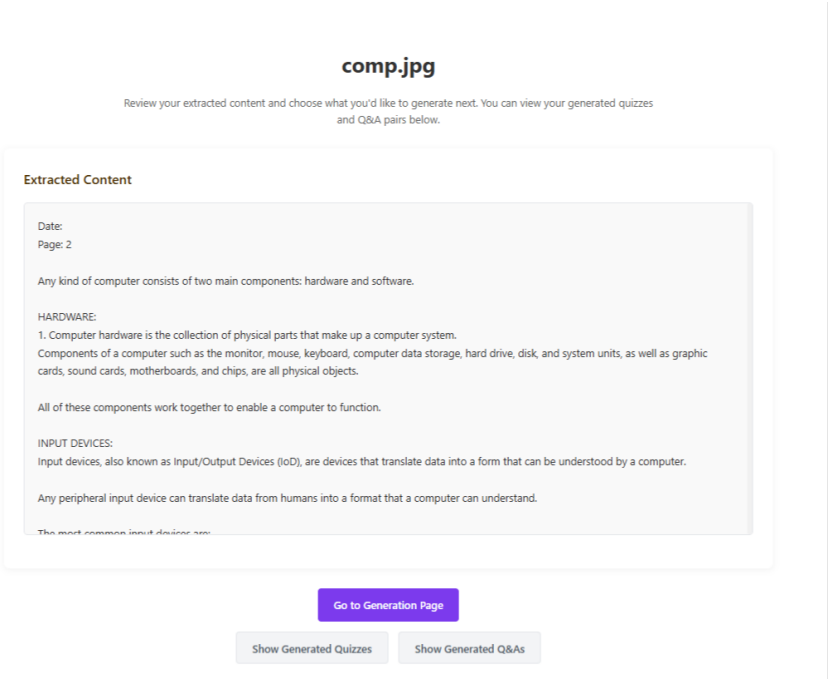
Elements and Functions:
• A search bar to filter uploaded content by keywords or titles in real-time.
• A list displaying each uploaded file with a snippet of extracted text, word count, and upload date.
• Action buttons to view the detailed page for each file or delete it permanently.
• Clear icons and labels to improve usability and navigation.



Uploaded Content Detail Page:

Purpose:
Displays the full extracted text from a selected note and provides options to generate quizzes or Q&A content.

Elements and Functions:
• A text panel showing the extracted content with formatting preserved.
• Buttons to generate quizzes or Q&A pairs from the text.
• Options to view already generated quizzes and Q&A materials for the note.
• A link or button to navigate back to the main generation page if needed.
• Clear labels and instructions guiding the user through next steps.



Coding Standards Document

Below is the link of the Coding Standards Document:

https://github.com/abzaidi/studyMate/tree/documents/documents/extra_documents

Project Policy Document

Below is the link of the Project Policy Document:

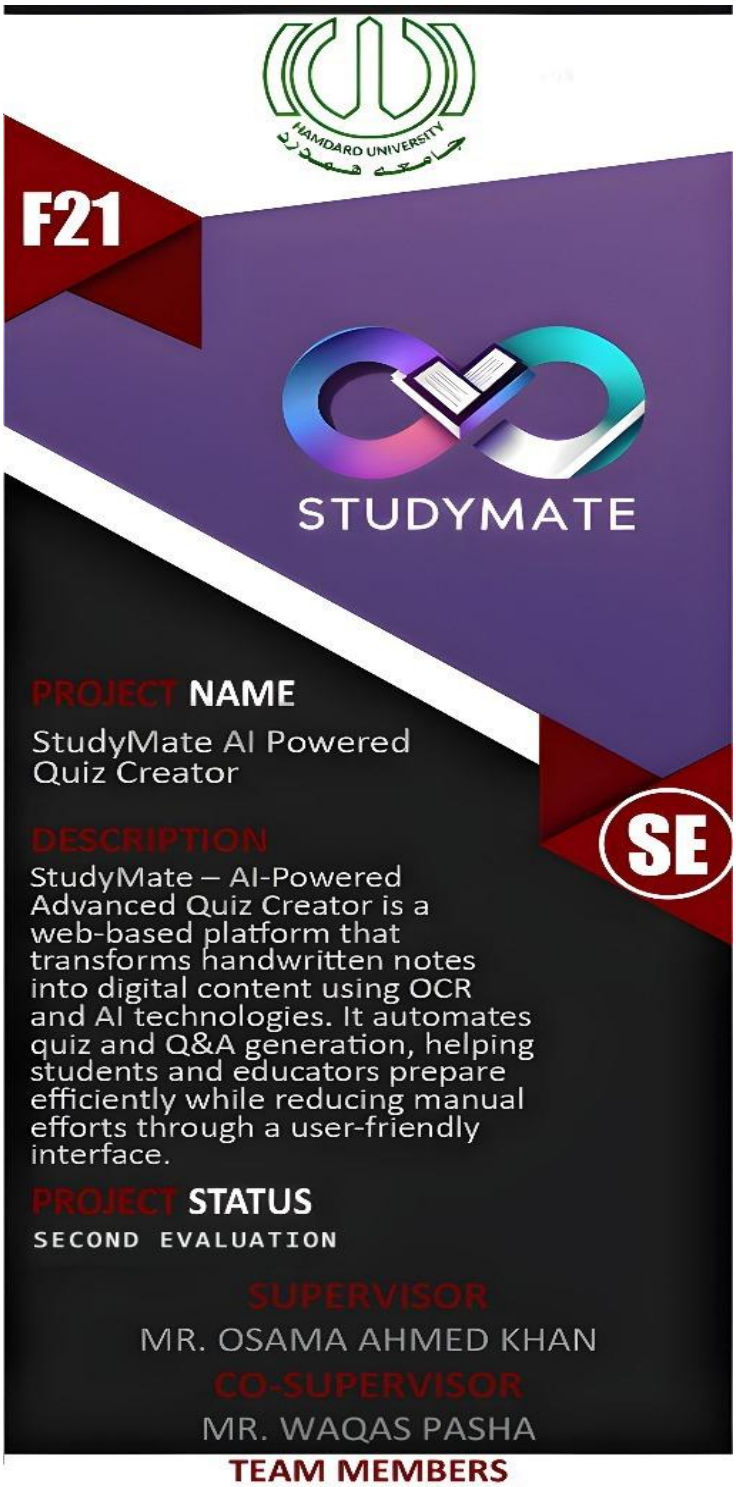
https://github.com/abzaidi/studyMate/tree/documents/documents/extra_documents

User Manual Document

Below is the link of the User Manual Document:

https://github.com/abzaidi/studyMate/tree/documents/documents/extra_documents

A5. FLYER & POSTER DESIGN



COPY OF EVALUATION COMMENTS BY JURY FOR PROJECT – I END SEMESTER EVALUATION

Saeed Ahmed
Aamir Hussain
Aijaz Ali
Umer Farooq

Normal
Satisfactory
Acheive what you have write in project.
Need to add, Some Literature review, As student used pre-trained model for the evaluation of the system, need to design custom dataset and train their model instead using the pretrained model

A7. MEETINGS' MINUTES & Sign-Off Sheet

Below is the link to all the minutes of meetings for FYP-1 and FYP-2

https://drive.google.com/drive/u/1/folders/1jj0e8tRTaFZ-nLx0eFTSwgdhyzipXTzn

A8. DOCUMENT CHANGE RECORD

Date	Version	Author	Change Details
10/09/2024	1.0	Hanzala	Prepared Draft of Report
20/12/2024	1.1	Abubakar	Complete first 3 chapters
29/06/2025	2.0	Abubakar	Finalize document

A9. PROJECT PROGRESS

FYP-1

FYP Fortnightly Sign-Up Sheet

Course: ~~FYP-1~~ • FYP-2 Project Code: FYP-037/FL24 Project Name: StudyMate - AI Powered Quiz Creator
Group Members Names & Reg#: S.M Abubakar Zaidi Hanzala Siddiqa
Supervisor Name: Ms. Osama Ahmed Khan Co-Supervisor's Name: Mr. Waqas Pasha

Meeting #	Date	Agenda (Brief Statement)	Attended By (Student's Name only)	Supervisor's Sign	Co-supervisor's Sign	FYP Officer's Sign
1	11-09-24	Discuss preparation and gathering of datasets	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		19/9/24
2	26-9-24	Choosing the best model to work on our dataset.	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		26/9/24.
3	10-10-24	Generate quizzes based on text extracted	Abubakar Zaidi Hanzala siddiqa	Sajma A. Khan		10/9/24.
4	24-10-24	Creating frontend and short Q/n/A for the project.	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		24/10/24.
5	7-11-24	Discuss choosing the best backend framework	Abubakar Zaidi Hanzala siddiqa	Sajma A. Khan		4/Nov/24
6	18-11-24	Discuss using Django as a backend framework	Abubakar Zaidi Hanzala siddiqa	Sajma A. Khan		19/11/24
7	11-12-24	Integration of quiz & q/n/a modules in Django.	Abubakar Zaidi Hanzala siddiqa	Sajma A. Khan		11/12/24
8	19-12-24	Integration of frontend templates to Django webpages	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		
9	14-01/25	Prepare documentations	Abubakar zaidi Hanzala Siddiqa	Sajma A. Khan		

FYP-2

FYP Fortnightly Sign-off Sheet

Course: ☐ FYP-1 ☑ FYP-2 Project Code: FYP-037/FL24 Project Name: StudyMate - AI Powered Quiz Creator
Group Members Names & Reg#: S.M Abubakar Zaidi Hanzala Siddiqa
Supervisor Name: Ms. Osama Ahmed Co-Supervisor's Name: Mr. Waqas Pasha External Supervisor:

Meeting #	Date	Agenda (Brief Statement)	Attended By (Student's Name only)	Supervisor's Sign	Co-supervisor's Sign	FYP Officer's Sign
1	17/2/25	Implement user authentication and discuss next steps	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		17/2/25
2	26/2/25	Store notes and other content to google cloud.	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		26/2/25
3	12/3/25	Store generated materials along with notes.	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		12/3/25
4	7/4/25	Show flash messages whenever a user login/logout	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		7/4/25
5	14/4/25	Topic based material generation based on notes	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		14/4/25
6	29/4/25	Create dashboard and get LLM response in JSON	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		29/4/25
7	12/5/25	Implement attempt quiz functionality and improve styling	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		12/5/25
8	1/7/25	Prepare documentation SRS, SDS, Report etc	Abubakar Zaidi Hanzala Siddiqa	Sajma A. Khan		
9						

StudyMate Report V2.0 (revised).pdf

ORIGINALITY REPORT

17%	10%	1%	16%
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