National University of Computer and Emerging Sciences Islamabad, Pakistan

Department of AI/DS

EDBOT

Smart Learning Content Creator

Supervised by

Dr. Asif Muhammad

Project Team

Dawood Tanvir 21i-1665, Duaa Fatima 21i-1667
Syeda Mahum Raza 21i-1662

Table of Contents

Chapter 1

1.1 Introduction

This proposal outlines the vision, goals, and technical roadmap for building an AI-powered system designed to simplify and automate the creation of educational content and assessments. It explains the problem we're addressing, the tools and techniques we'll employ, and the outcomes we aim to achieve. The goal is to ensure that all stakeholders clearly understand the project's purpose and have a well-defined plan to guide its success from start to finish.

1.2 Problem Statement

Learners often face challenges when they don’t receive personalized learning experiences or timely feedback. When assessments aren’t tailored to their skill level, they might end up with tasks that are either too easy or too hard, making learning frustrating and less effective. This can leave them without the right balance of challenge and support when they need it most. Delayed feedback only makes things worse, leaving students unsure of their progress and where to improve. As a result, they can feel stuck, leading to even more frustration.

1.3 Motivation

Our motivation for addressing this problem comes from our own experiences as students, where we've often struggled with preparing for exams and keeping up with course material. We know firsthand how hard it can be to find reliable study resources, get timely feedback, and access personalized content that truly fits our learning needs. The lack of tailored resources and high-quality materials often makes understanding complex concepts and performing well on exams even more difficult. With this system, we aim to tackle these challenges by offering automated, high-quality slides and adaptive assessments to make learning easier and enhance the overall student experience.

1.4 Problem Solution

This software is designed to simplify learning by automating the creation of educational materials. It generates PowerPoint slides with relevant content and

images, providing learners with well-organized, informative study resources. It also creates personalized quizzes with different levels of difficulty and gives timely feedback, helping learners track their progress and focus on areas that need improvement. By automating these tasks, the software saves time and boosts productivity, allowing students to spend more time understanding complex concepts and achieving their academic goals.

1.5 Features

- **Adaptive Assessment Generation:** The system will generate various types of assessments, including multiple-choice questions (MCQs), true/false questions, and short answer questions, tailored to the content and the learner's needs. This ensures that assessments are relevant and appropriately challenging across different difficulty levels.

- **Appropriate Image Generation:** The system will generate images corresponding to the content in the slides for better learning experience.

- **Intelligent Difficulty Levels**: Assessment difficulty will automatically adapt based on how well the learner is performing. If the learner excels, the system will increase the difficulty; if they struggle, it will lower the difficulty. This ensures that the assessments remain challenging but achievable, providing a personalized and effective learning experience.

- **Threshold-Based Grading System:** The software will include an automated grading system that evaluates student responses and provides personalized feedback based on performance. Using threshold-based criteria ensures that feedback is constructive and tailored to individual needs.

- **Multi-Format Export Options:** Users can export content in various formats, such as PDF, PPTX, and DOCX, making it easier to share and integrate materials across different platforms.

- **Instant AI-Generated Feedback:** Learners will receive immediate, AI-driven feedback on their assessments, helping them quickly understand their performance and areas where they can improve. This real-time feedback supports continuous learning and timely intervention.

1.6 Stake Holders

Stakeholders include:

1.7 Tools and Technologies

- ReactJS
- ExpressJS
- MongoDB
- NodeJS
- Python
- Visual Studio Code
- Natural Language Processing
- LLM Training

1.8 Work Division

For each module and respective feature, assigned responsibility to a team member

Table 1.1: Work Division Table

Member	Responsibility	Skills needed
Dawood Tanvir	- Adaptive Assessment Generation - Smart Difficulty Adjustment	NLP, AI-based personalization, machine learning
Duaa Fatima	- Relevant Image Generation - Flexible Export Options	Image generation models, computer vision, file export integration
Mahum Raza	- Threshold-Based Grading System - Instant AI-Generated Feedback	Data analysis, automated grading, AI-driven feedback systems
All Team Members	• Participate in testing and quality assurance across the platform.	Web dev, testing

	• Collaborate on project documentation and user tutorials. • Ensure integration between models, UI, and backend.	

1.9 TimeLine

Table 1.2: Project Timeline

Iteration#	Time Frame	Tasks/Modules
1	Aug 2024 - Oct 2024	Data Collection, Cleaning & DB
2	Nov 2024	Data Annotation & Organization
3	Dec 2024 - Jan 2025	Content Generation Model Development
4	Jan 2025 – Feb 2025	Image Generation and Assessment Generation
5	Feb 2025	Grading & Feedback System Development
6	Mar 2025 - July 2025	System Integration & Testing
7	Apr 2025	Deployment & User Feedback
8	Ongoing	Post-Deployment Support & Continuous Improvement

1.10 Project Workflow

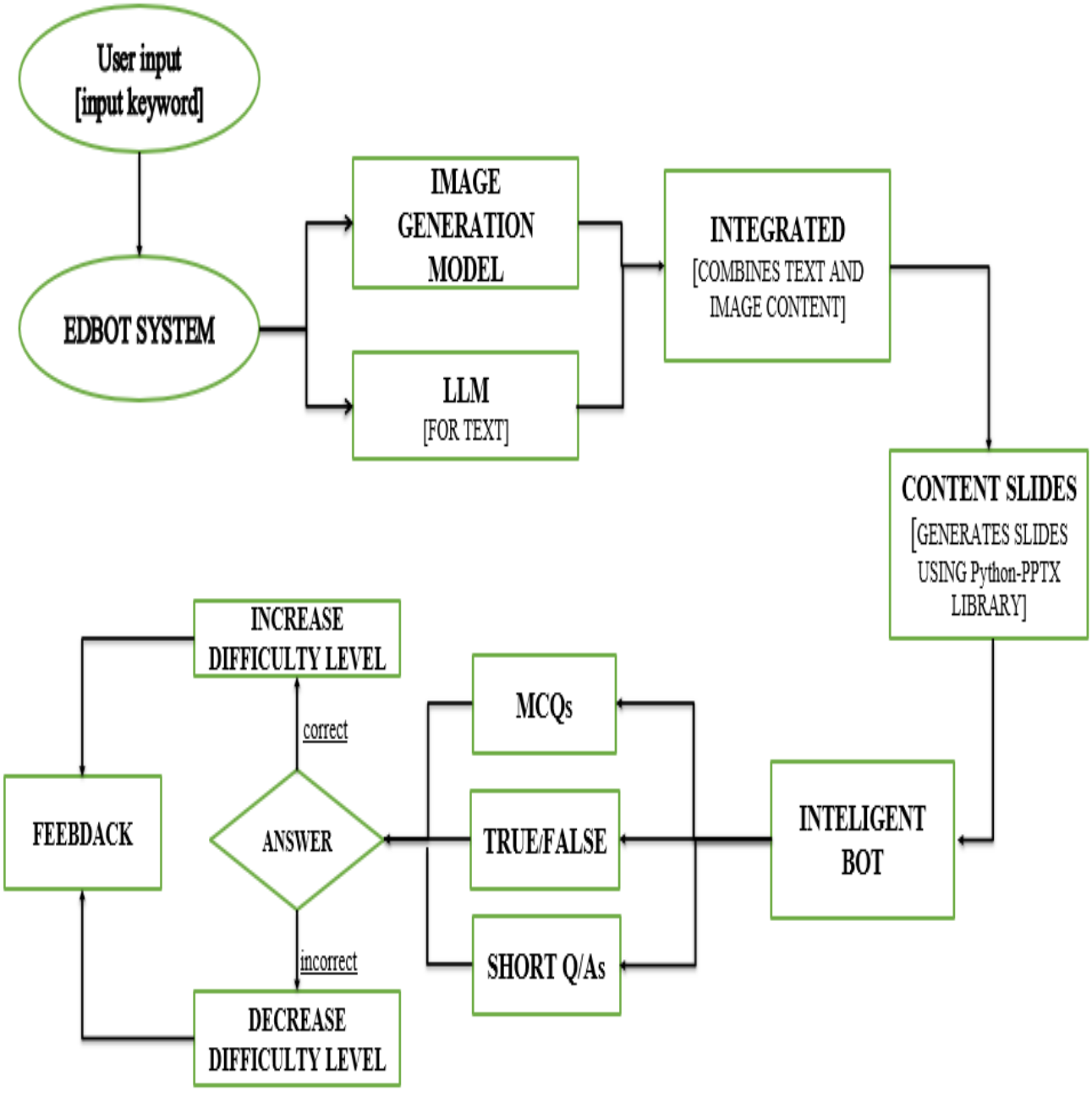
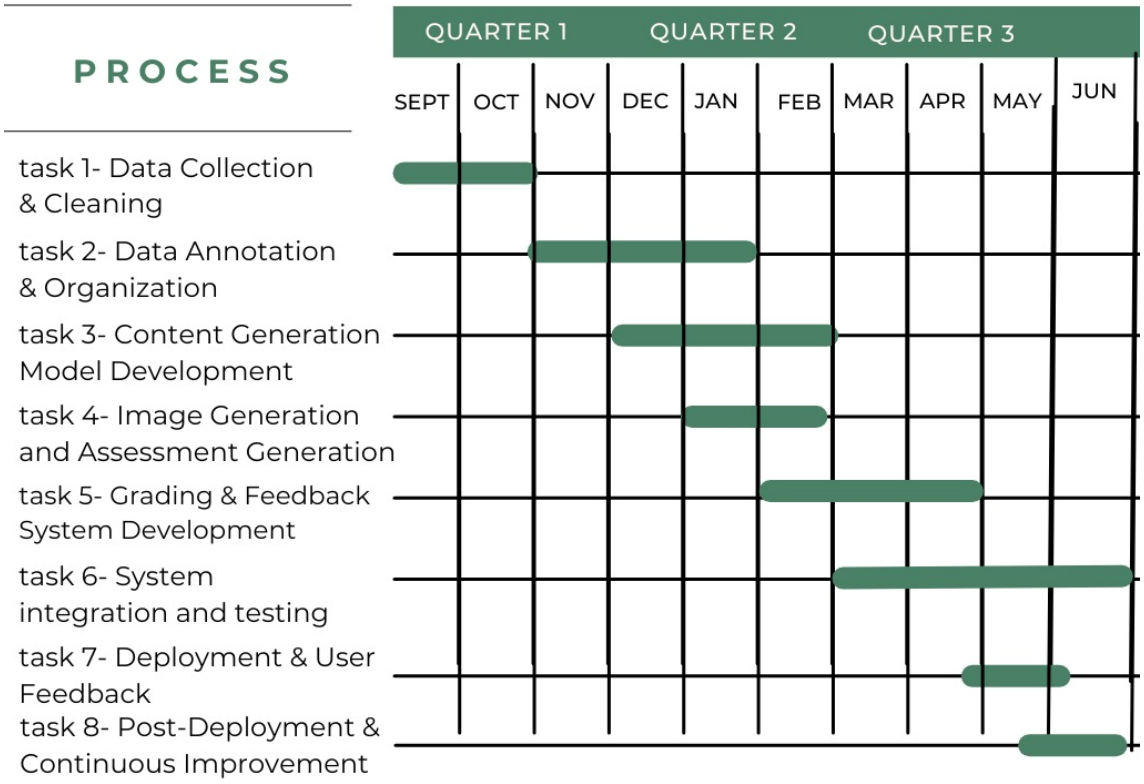


Figure 1.1: Flowchart

1.11 Gantt Chart



Represents the timeline of the project

Figure 1.2: Gantt Chart

1.12 Conclusion

EDBOT is transforming how educational content and assessments are created by automating the process of generating slides and adaptive tests. It uses AI to enhance the learning experience with personalized content, real-time feedback, and easy integration with Learning Management Systems. By simplifying content creation and grading, EDBOT helps educators provide high-quality, customized materials, making learning more effective and personalized for students.