



University of
Management and
Technology

Final Year Project Proposal

Department of Software Engineering

School of Systems and Technology

1) Project Title

Adaptive E Learning with AI

2) Names and IDs of Students

- 1) Babar Azam F2021065140
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- 3) Leo Messi F2021065130
- 4) Ben Stokes F2021065112

3) Project Advisor (Name, Email Address)

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4) Project Co-Advisor Name (Optional)

Sir Lewis Hamilton

5) Project Description (Brief Introduction)

Overview of Topic/Domain

Domain: Education Technology (EdTech)

- Focuses on leveraging technology to enhance learning experiences.
- Aims to make education more accessible, personalized, and effective.
- Integrates AI to transform traditional teaching methods.
- Enables dynamic, data-driven educational solutions.

Project Description

Problem Statement:

- Lack of Personalized Learning: Students often face generic content that doesn't match their learning pace or needs.
- Time-Consuming Assessment Creation: Educators spend significant time creating quizzes and tests.
- Enhanced Accessibility: Learning materials are not always available or adaptable for diverse audiences.
- Inconsistent Content Quality: Educational resources often lack standardization and relevance.

Solution to Explore

1) AI-Driven Question Generation:

Allow users to upload their own study materials (e.g., PDFs, text files).
Automatically generate relevant questions from the uploaded content.

2) Dynamic Content Personalization:

Analyze learners' performance. Adapt the difficulty level of study materials in real-time to suit individual needs.

Expected Results and Product

- Upload Study Material: Seamless upload of PDFs, text files, or notes for content analysis.
- AI-Powered Question Generation: Instant quiz creation from user-provided study materials.
- Dynamic Difficulty Adjustment: Real-time adjustment of question difficulty based on student responses, ensuring an optimal learning curve.
- Progress Tracking: A comprehensive analytics dashboard for students and educators to monitor progress and performance.
- Deployment-Ready Solution: Fully containerized backend and frontend for streamlined cloud deployment.

6) Major Features/Requirements/Objectives (Tentative)

Functional Requirements

- 1) User Authentication and Authorization
- 2) Ability to Upload Study Material
- 3) Content Parsing and Extraction

- 4) AI-Powered Question Generation
- 5) Progress Tracking
- 6) Adaptive Learning Path
- 7) Adaptive Difficulty Based on Answers

Non-Functional Requirements

- 1) Reliability
- 2) Security
- 3) Usability
- 4) Portability
- 5) Performance

7) Artificial Intelligence Features/ Requirements/ Objectives (Tentative)

- 1) Machine Learning (ML)
- 2) Natural Language Processing (NLP)
- 3) Large Language Models (LLMs)
- 4) Retrieval Augmented Generation (RAG)
- 5) Optical Character Recognition (OCR)

8) Research related Projects Features/ Requirements/ Objectives (Tentative) (Optional)

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9) Target Users/Beneficiaries of the Proposed System

- Educators/Teachers
- Students/Learners
- Educational Institutions

10) Tools/Technologies (Tentative Listing)

- Django
- Django Rest Framework
- FAST API
- PostgreSQL
- Chroma, Pinecone (Vector DB)
- Redis
- React
- Docker
- CI / CD Pipelines
- LLM'S

11) Cloud Platform Being Used (Tentative Listing)

- Microsoft Azure
- Digital Ocean

12) External Collaboration/Funding (if any) + Paid or Unpaid (Confirmed or Expected)

None currently.
