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

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3) Project Advisor (Name, Email Address)

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4) Project Co-Advisor Name (Optional)

Sir Waqar Ashiq

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.
