



CAPSTONE PROJECT REPORT

Report 1 – Project Introduction

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I. Record of Changes

Date	A* M, D	In charge	Change Description
13/09/2024	A	AnhLQH	Project introduction – Overview, Project Background, Business Opportunity.
14/09/2024	A	AnhLQH	Project introduction – Existing system, Project Scope & Limitations
16/09/2024	M	AnhLQH	Project introduction - Project Scope & Limitations
18/09/2024	M	AnhLQH	Project introduction - Project Scope & Limitations
18/10/2024	M	NamDD	Project introduction - Project Scope & Limitations
19/10/2024	M	DuyPA	Project Information
19/10/2024	M	DucLM	Project Team
20/10/2024	M	AnhND	Product Background and Business Opportunity

*A - Added M - Modified D - Deleted

II. Project Introduction

1. Overview

1.1 Project Information

- Project name: **AskBEAN**
- Vietnamese name: **Web hỗ trợ ôn tập kiến thức thông minh**
- Project code: **ABEAN**
- Group name: **SEP490-G79**
- Software type: **Website**

1.2 Project Team

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2. Product Background

In recent years, the education landscape has seen a growing demand for smarter, more efficient study tools that leverage technology to aid in student learning and exam preparation. Traditional methods of review and self-assessment, such as manual quizzes and studying from textbooks, are often time-consuming and lack personalised feedback. As a result, many students struggle to identify their weak areas and effectively prepare for exams.

Recognizing this gap, a group of educators and students proposed the idea of creating an AI-powered platform tailored specifically not only to help students review through quizzes, but also point out the weakness the students had as well as giving advice. The platform is designed to automate the generation of quizzes based on the study materials provided by the students, analyse their mistakes, and offer targeted feedback to address areas of knowledge deficiency. This innovation is intended to streamline the revision process and offer a personalised learning experience, enhancing both the efficiency and effectiveness of study sessions.

The main target users of this platform are students and any learners, who often face challenges in managing their study workload, especially during exam periods. By integrating AI, the platform aims to reduce the time spent on creating review materials while ensuring that students receive the guidance they need to succeed academically.

3. Existing Solutions

3.1 Remind

- **Description:** Remind is an online private mobile messaging platform that aims to help teachers, **Link:** <https://quizlet.com>
- **Actors:** Students, teachers.
- **Features:**
 - User-created flashcards and quizzes.
 - Multiple study modes: flashcards, learn, write, match, and test.
 - Pre-made study sets.
- **Pros:**
 - Easy to use and highly customizable.
 - A large collection of pre-made study materials.
 - Multiple interactive modes to engage users.
- **Cons:**
 - No AI-powered quiz generation based on study materials input.
 - Lacks detailed analysis of user mistakes.
 - Limited to user-created content, not fully adaptive.

3.2 Kahoot!

- **Description:** Kahoot! is a game-based learning platform that allows users to create and participate in quizzes in a fun, interactive format, often used in group settings.
- **Link:** <https://kahoot.com>
- **Actors:** Students, teachers, organizations.
- **Features:**
 - Game-based quizzes that promote engagement.
 - Real-time participation in group settings.
 - Multiple question types (e.g., multiple choice, true/false).
- **Pros:**
 - Highly engaging and fun for group learning.
 - Real-time interaction and participation.
 - Suitable for classroom use.
- **Cons:**
 - Focuses on group quizzes, not individual learning.
 - No AI analysis or personalized quiz generation.
 - Lacks feedback on individual mistakes.

3.3 Duolingo

- **Description:** Duolingo is a language learning app that uses gamification to teach various languages. It adapts lessons based on user performance and provides personalized feedback.
- **Link:** <https://www.duolingo.com>
- **Actors:** Language learners.
- **Features:**
 - AI-driven adaptive lessons.
 - Personalized feedback based on user performance.
 - Progress tracking and streaks to motivate users.
- **Pros:**

- Engaging and personalized lessons.
- Adapts to user performance to focus on weak areas.
- Continuous feedback and progress tracking.
- **Cons:**
 - Limited to language learning.
 - Not suitable for non-language subjects.
 - Lacks the flexibility to input custom syllabi for quiz generation.

4. Business Opportunity

The rise of technology in education has opened up significant opportunities for innovation, particularly in the realm of student learning and exam preparation. Traditional methods, such as studying from textbooks and attending review sessions, are often inefficient and lack the personalised touch that many students need to succeed. As a result, there is a growing demand for tools that can assist students in reviewing material, identifying weaknesses, and receiving tailored feedback to improve.

Currently, many educational platforms offer quizzes, but they are typically generic and do not provide customized analysis or advice based on individual performance. Moreover, creating personalised quizzes or study guides manually is time-consuming and often fails to target areas where students are struggling the most. This creates a gap in the market for a solution that can automatically generate quizzes based on a specific study material, analyse student mistakes, and offer personalised advice.

Our proposed AI-powered quiz platform directly addresses these challenges by automating the quiz creation process, providing detailed error analysis, and offering advice to help students improve in areas where they lack understanding. The platform leverages artificial intelligence to create an adaptive learning environment, enabling students to focus on their weak points efficiently.

The product will compete in the growing market of EdTech solutions, where the demand for smarter, more personalized study tools is increasing. Existing products in the market often focus on providing general content or fixed quizzes without personalization. Our platform differentiates itself by offering dynamic quiz generation based on user input, AI-driven mistake analysis, and tailored guidance - an approach that aligns with current trends in personalized and adaptive learning solutions.

By solving the problem of inefficient study methods and providing a more focused, personalized learning experience, our platform not only enhances student preparation but also fits into the broader trend of integrating AI into education. This strategic direction positions the product to meet both current and future market demands.

5. Software Product Vision

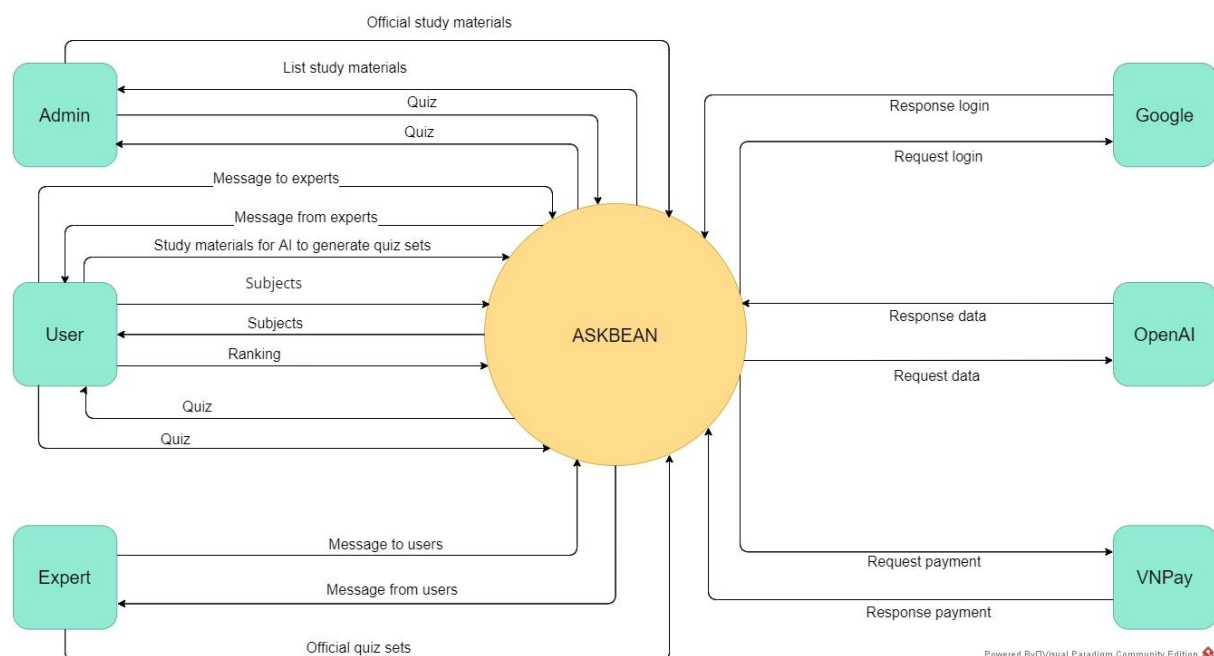
For students seeking a more efficient and personalized way to prepare for exams, our AI-Powered Quiz Platform is an online and AI-driven solution that automates quiz generation,

grades exams, analyses user mistakes, and provides targeted advice based on their study materials. Furthermore, our system utilizes two machine learning models, SBERT and mBART-50, to check, eliminate duplicate contents and even grade essay questions helping users achieve higher efficiency. Unlike existing quiz platforms that offer static content and generic feedback, our system enables students to input their specific course materials, receive dynamically generated quizzes, and get personalized insights to improve weak areas.

The platform will empower students to focus on the areas that need the most attention, ultimately enhancing their study efficiency and boosting exam performance. It will revolutionize the way students interact with their study materials by offering a tailored learning experience, integrating AI to guide users through a smarter, more effective review process. Our vision is to create a world where students are no longer overwhelmed by exam preparation but instead can confidently approach their studies with the support of cutting-edge AI technology.

6. Project Scope & Limitations

The scope of this project is to develop an AI-powered quiz platform designed for students from elementary to high school who want to review and prepare for exams based on syllabi provided by their teachers. The platform will enable users to input their specific course outlines, after which the system will generate quizzes tailored to the subject matter. In addition, it will analyse incorrect answers, grading essays and provide personalized advice on areas of weakness to enhance the learning experience.



6.1 Major Features

FE-01: AI-generated quizzes based on study materials provided by users, tailored to the subject matter and difficulty level.

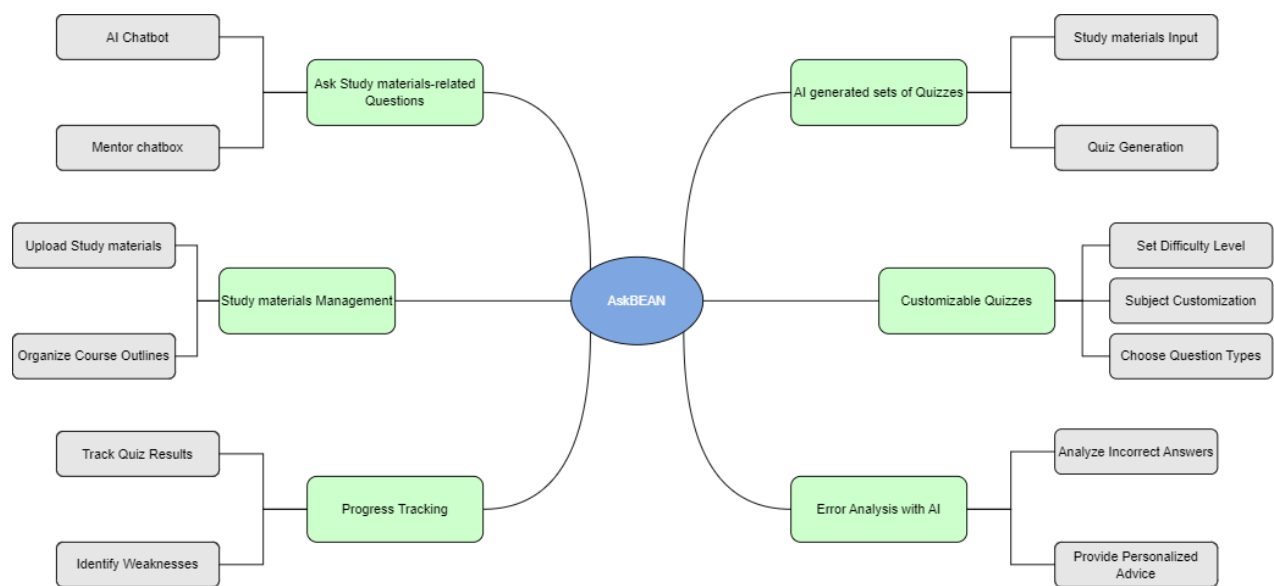
FE-02: Error analysis of student responses, highlighting areas of weakness and providing personalized advice for improvement.

FE-03: AI-powered chatbot that allows users to ask questions regarding specific topics within their study materials for instant guidance.

FE-04: Progress tracking system that monitors quiz results over time, enabling students to identify trends in their performance and focus on weak areas.

FE-05: Study materials management feature, allowing users to upload, edit, and organize course outlines for quiz generation.

FE-06: Customizable quiz difficulty settings and question types (multiple choice, fill-in-the-blank, etc.) to suit different learning needs.



6.2 Limitations & Exclusions

LI-01: Advanced multimedia content (e.g., video-based quizzes) will not be supported in the initial release, limiting content to images.

LI-02: The system may contain wrong or inaccurate information.

LI-03: The system may produce unrelated information.

LI-04: The UX of the system seems to be hard to use for the first time.