

INF2007 - Mobile Application Development - Project Design

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Chapter 1

Project Proposal

1.1 Problem Statement

The challenge at hand involves new students at SIT facing a **significant academic leap** from their previous educational experiences. The transition to university life brings forth various obstacles, including *adapting to a different teaching style* and *managing a more demanding workload*. This situation is a common struggle among **freshmen**, impacting their overall learning experience. The goal is to understand and address these challenges effectively by designing supportive educational systems and strategies that aid students in *navigating the complexities of university life*, fostering a *smoother transition*, and enhancing their learning journey.

1.2 Implications

Without proactive measures to support students in their transition to university life, there is a risk of **increased academic stress**, *reduced satisfaction with the learning experience*, and potentially *higher dropout rates*. Recognizing and addressing these challenges is crucial for the overall success and well-being of students, emphasizing the need for institutions to invest in *tailored support systems*, *mentorship programs*, and *teaching methodologies* that facilitate a more seamless adaptation to the demands of higher education.

1.3 Persona

Name	Alex
Age	19
Gender	Male
Program	Computing Science
Location	Singapore Institute of Technology (SIT), Singapore
Background	Alex is the first in his family to step into the realm of higher education. He is enthusiastic about the opportunities that university life offers but is equally apprehensive about the academic hurdles that may come his way.
Goals	Alex aspires to attain a quality education that opens doors to promising career prospects. Additionally, he seeks to establish new connections, make friends, and engage in extracurricular activities for a well-rounded university experience.
Pain points	Alex is concerned about the rigorous academic workload in college, unsure of how to strike a balance between studies and social life. The prospect of making friends and fitting into the university environment adds to his worries.

Other important information	A diligent worker, Alex is determined to succeed in his academic journey. While slightly reserved, he is keen on overcoming shyness to build meaningful connections with his peers.
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1.4 Proposed Solution

Building upon the identified challenges, we propose a multifaceted solution designed to elevate the university experience.

1.4.1 A Peer-to-Peer Learning Platform

Inspired by popular platforms like Reddit and Instagram, our application fosters a forum-like environment where students, like Alex, can:

- Ask questions and seek answers directly from peers.
- Upvote and prioritize valuable responses through a refined voting system.
- Browse a curated feed of questions tailored to their interests.
- Follow specific tags and explore a wider range of inquiries through a dedicated "Explore" page.
- Manage their profiles and interactions effectively.

1.4.2 Technology Stack

This solution leverages a blend of technologies to ensure optimal functionality:

- **Networking:** Robust interactions and information exchange are facilitated through APIs from Firebase and Google AI.
- **Databases:** Secure and efficient data storage and retrieval are achieved using a combination of SQLite (cache) and Firebase databases.
- **Multimedia:** The platform integrates video and photo functionalities, allowing students to capture and share memorable moments, enriching their learning experience.
- **Optical Character Recognition (OCR):** Streamlining academic endeavors, OCR technology converts printed or handwritten text into digital formats, enhancing organization and accessibility of study materials.

1.4.3 Motivation

This project is driven by a commitment to easing the academic transition for new university students. Recognizing the common challenges faced by freshmen, we aim to create a supportive online community where students can learn and grow together. This platform empowers introverted students to voice their questions and fosters a collaborative environment where peers can assist each other during this crucial phase.

Chapter 2

User Stories

2.1 User Story 1: Assistance in Learning

Title: Efficient Assistance for Challenging Concepts

Description: As Alex, I seek a platform to efficiently connect with peers or tutors for assistance in understanding challenging study concepts. The ability to post specific questions, receive timely responses, and engage in meaningful discussions is crucial for overcoming academic hurdles.

2.2 User Story 2: Effective Learning Resources

Title: Comprehensive Learning Resources

Description: In the pursuit of effective learning, I, as Alex, look for a platform with accessible and comprehensive learning resources. A system recognizing diverse learning styles and offering personalized educational tools ensures a more efficient and rewarding academic experience.

2.3 User Story 3: Peer Support Platform

Title: Collaborative Peer Support

Description: As a student like Alex, I value a peer support platform for academic discussions. A space for engaging in meaningful conversations, sharing insights, and collectively tackling challenging topics fosters a sense of community, providing valuable academic assistance and building connections.

2.4 User Story 4: Seamless Collaboration

Title: Effortless Topic Following

Description: Recognizing the significance of collaboration in successful learning, I, as Alex, envision a platform that effortlessly connects me with peers. A streamlined system allowing me to follow topics created by other users, engage in discussions, and collaboratively explore diverse subjects ensures a collective learning journey and establishes connections with fellow students.

2.5 User Story 5: Time Management Tool

Title: Effective Time Management

Description: Recognizing the challenges of managing time effectively, I, as Alex, require a dedicated time management tool. This tool, featuring task tracking, study logs, and personalized study plans, significantly contributes to balancing academic responsibilities, extracurricular activities, and personal time.

Chapter 3

UI Prototypes

3.1 Prototype 1

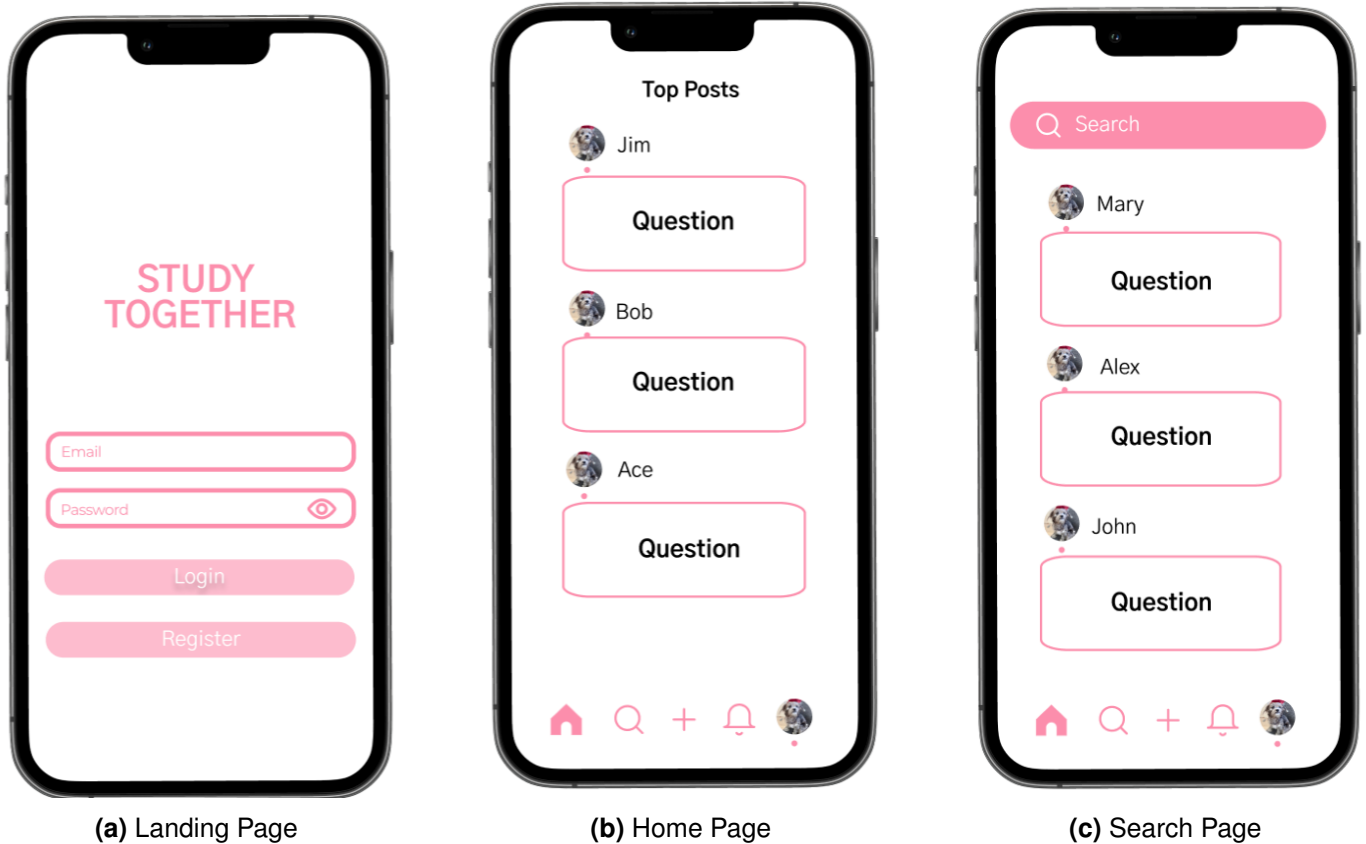
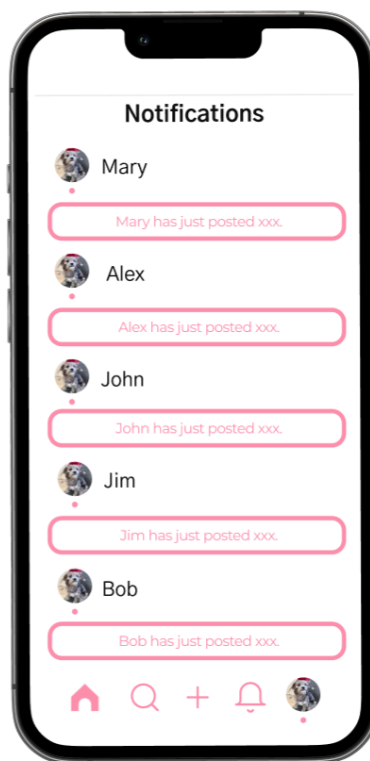


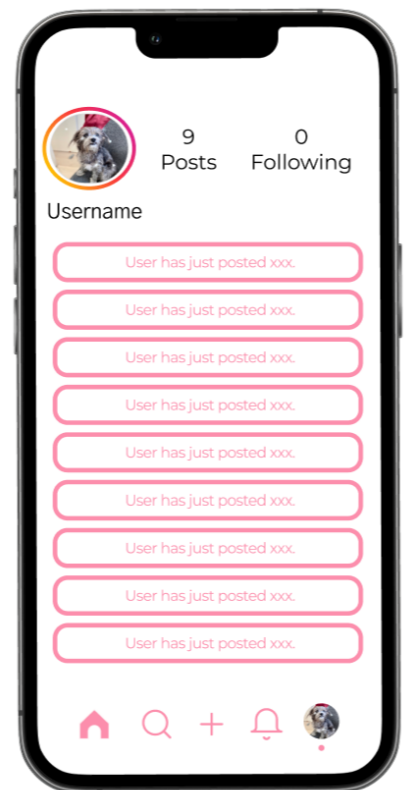
Figure 3.1: Key screens of Prototype 1, showcasing various UI elements and interactions for the mobile app.



(a) Upload Page



(b) Notification Page



(c) Profile Page

Figure 3.2: Key screens of Prototype 1, showcasing various UI elements and interactions for the mobile app.

Chapter 4

Backlogs

4.1 Product Backlog

Product Backlog

ID	User Story	Priority
1	Efficient Assistance for Challenging Concepts: Users can post questions and receive timely responses, facilitating efficient learning support.	High
2	Comprehensive Learning Resources: The platform provides accessible and personalized learning resources, catering to diverse learning styles.	High
3	Sign-in Functionality: Users should be able to sign in to the platform securely.	High
4	Account Creation Feature: A user-friendly process for creating new accounts.	Medium
5	Password Reset Capability: Users should have the option to reset their passwords.	Low
6	User Profile Management: Users can edit and manage their profiles, enhancing personalization.	Medium
7	Notification System: Implement a notification system to alert users about responses, updates, and relevant information.	Medium
8	Voting Mechanism: Introduce a sophisticated voting system for assessing and prioritizing responses.	High
9	Tag Subscription (Following): Users can subscribe to specific tags for a personalized feed of questions.	Medium
10	Explore Page: A curated page showcasing a collection of questions for users to explore.	Low
11	Camera Functionality: Integration of video and picture capabilities for visual content sharing.	Medium
12	OCR Integration: Implement Optical Character Recognition (OCR) for efficient conversion of printed or handwritten text into digital content.	Low

4.2 Sprint Backlog

Sprint Backlog - Sprint 1

ID	Task	Estimate (hours)
1	Implement sign-in functionality	8
2	Design user registration form	5
3	Set up password reset functionality	3
6	Sign-in Functionality: Users should be able to sign in to the platform securely.	8
7	Account Creation Feature: A user-friendly process for creating new accounts.	6

Sprint Backlog - Sprint 2

ID	Task	Estimate (hours)
4	User Profile Management: Implement user profile editing and management features	10
5	Notification System: Develop a system to alert users about responses and updates	8
11	Voting Mechanism: Integrate a sophisticated voting system for assessing and prioritizing responses	12
12	Tag Subscription (Following): Implement the feature allowing users to subscribe to specific tags	9

Sprint Backlog - Sprint 3

ID	Task	Estimate (hours)
8	Explore Page: Develop a curated page showcasing a collection of questions for users to explore	6
9	Camera Functionality: Integrate video and picture capabilities for visual content sharing	8
10	OCR Integration: Implement Optical Character Recognition (OCR) for efficient text conversion	10
13	Explore Page: A curated page showcasing a collection of questions for users to explore.	6
14	Camera Functionality: Integration of video and picture capabilities for visual content sharing.	8
15	OCR Integration: Implement Optical Character Recognition (OCR) for efficient conversion of printed or handwritten text into digital content.	10

Chapter 5

Software Architecture

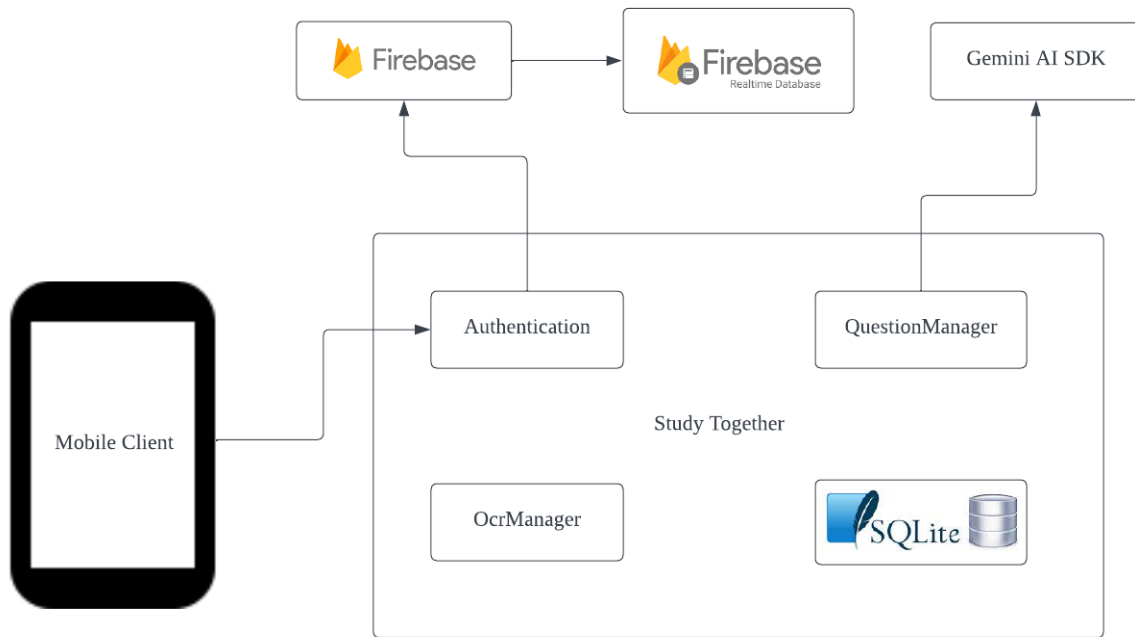


Figure 5.1: Initial Software Architecture

The diagram illustrates the software architecture designed for our Android application "Study Together." The application leverages the Firebase SDK to access its Authentication and Database services. Additionally, it utilizes a SQLite database to establish and maintain a local cache derived from the Firebase Database, enhancing the overall performance of the application.

The core of our application is the QuestionManager Package, which encapsulates the core functionality related to questions and answers within the program. This component integrates with Google's Gemini AI API to generate potential answers for user queries and also contains functionality for other users to upload and vote on recommended answers. Moreover, an OcrManager component is incorporated, featuring an Optical Character Recognition (OCR) library. This facilitates the extraction of text or questions from images captured by the camera, enabling users to upload questions seamlessly.