

Project Design Phase - I

Solution Architecture

Date	23 October 2023
Team ID	Team - 590879
Project Name	Owl: A Material Design App
Maximum Marks	4 Marks

Team Members:

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Solution Architecture:

Requirements Elicitation:

Engage in a thorough discovery phase to understand the unique challenges in the educational domain and the specific needs of students, instructors, and administrators.
Gather insights into the course content and the expectations for the learning experience.

Technology Evaluation:

- Choose Kotlin as the primary programming language for Android app development due to its modern features and strong community support.
- Adopt Android Jetpack components to enhance development efficiency, using Navigation for smooth user journeys and View Binding for improved UI development.
- Implement Firebase Authentication to provide various login methods, such as email and password, Google Sign-In, Facebook Login, and Gmail Login, ensuring a secure and user-friendly login experience.
- Utilize SQLite for local data storage to support offline access to course content and Firebase Realtime Database or Firestore for cloud data storage, enabling real-time updates and synchronization.

- Develop server-side components using technologies like Node.js to manage user accounts, user-generated content, and communication between the app and the server.
- Enhance search functionality by integrating a powerful search engine or API like Elasticsearch or Algolia to provide accurate and efficient content discovery.

Architecture Definition:

Create an architectural diagram that visualizes the app's structure, including components like activities, fragments, and data repositories.

Highlight the interactions between components, emphasizing the role of Firebase for authentication and data storage, as well as the server-side components for content management.

Behaviour Specification:

Define how the app will behave, ensuring that users can seamlessly navigate the app, access course content, interact with collaborative learning communities, and access inclusive and accessible content.

Feature Prioritization:

- **User Authentication:** Develop a user authentication system that accommodates multiple login methods for a seamless and secure user experience.
- **Content Creation and Management:** Enable content creators to craft and publish courses and course materials while allowing for multimedia content, such as images and videos.
- **Material Design Styling:** Apply Material Design principles to create an aesthetically pleasing and user-friendly UI.
- **Collaborative Learning Communities:** Provide features that foster interactions and knowledge sharing among users, encouraging a sense of community.
- **Hybrid Business Model:** Develop a hybrid business model that offers free access to basic content and premium features for additional value.
- **Continuous Feedback Mechanisms:** Incorporate feedback mechanisms to gather user input and shape app development according to evolving user needs.
- **Sustainability and Inclusive Content:** Integrate sustainability initiatives and ensure inclusivity in course content, aligning with the brand's attributes.
- **Partnerships with Educational Institutions:** Establish partnerships with recognized educational institutions to enhance the app's credibility and course offerings.

- **Interactive Assessments and Gamification:** Enhance user engagement through interactive assessments and gamification elements.

Development Phases:

Phase 1 (Foundations):

- User authentication and registration, ensuring secure access.
- Initial UI design with Material Design principles.
- Core features for content creation and basic course management.

Phase 2 (Enhancements):

- Advanced content display with Material Design styling.
- Search functionality for easy content discovery.
- User preferences, dark mode support, and accessibility enhancements.
- Privacy policies and content moderation tools to ensure responsible data use.

Phase 3 (Community and Growth):

- Support ticket system for efficient user inquiries and issue resolution.
- Administrative features for user management and content oversight.
- Integration of sustainability initiatives and ethics into content creation and management.
- Gamification elements to motivate and engage users in their learning journey.

Solution Requirements:

- **Data Encryption:** Implement robust data encryption to protect user data at rest and in transit.
- **User Data Privacy Policies:** Develop and communicate clear data privacy policies that define how user data is handled, ensuring transparency and user consent.
- **Content Moderation Tools:** Incorporate content moderation tools to monitor and maintain a respectful and safe learning environment.
- **Compliance with Data Protection Regulations:** Ensure strict compliance with data protection regulations to safeguard user data and privacy.

Key Stakeholders in the Solution Approach:

- **End Users:** Students and learners using the "Owl-M" app for accessing courses and learning materials. Their experience and engagement are central to the success of the app.
- **Content Creators:** Instructors and course authors who create and publish educational content on the platform. They need user-friendly tools for content creation and management.
- **Administrators:** App administrators responsible for managing user accounts, content moderation, and maintaining the app's ethical and inclusive standards.
- **Customer Care Executives:** Support staff who handle user inquiries and support tickets, ensuring timely issue resolution and a positive user experience.
- **Developers:** The development team responsible for building and maintaining the app. They need to implement the chosen technologies and features effectively.
- **Educational Institutions:** Partner institutions that collaborate with "Owl-M" to offer recognized qualifications and enhance the app's credibility.
- **Regulatory Bodies:** Government agencies or bodies that oversee data protection and privacy regulations. Compliance with these regulations is essential.

Solution Architecture Diagram:

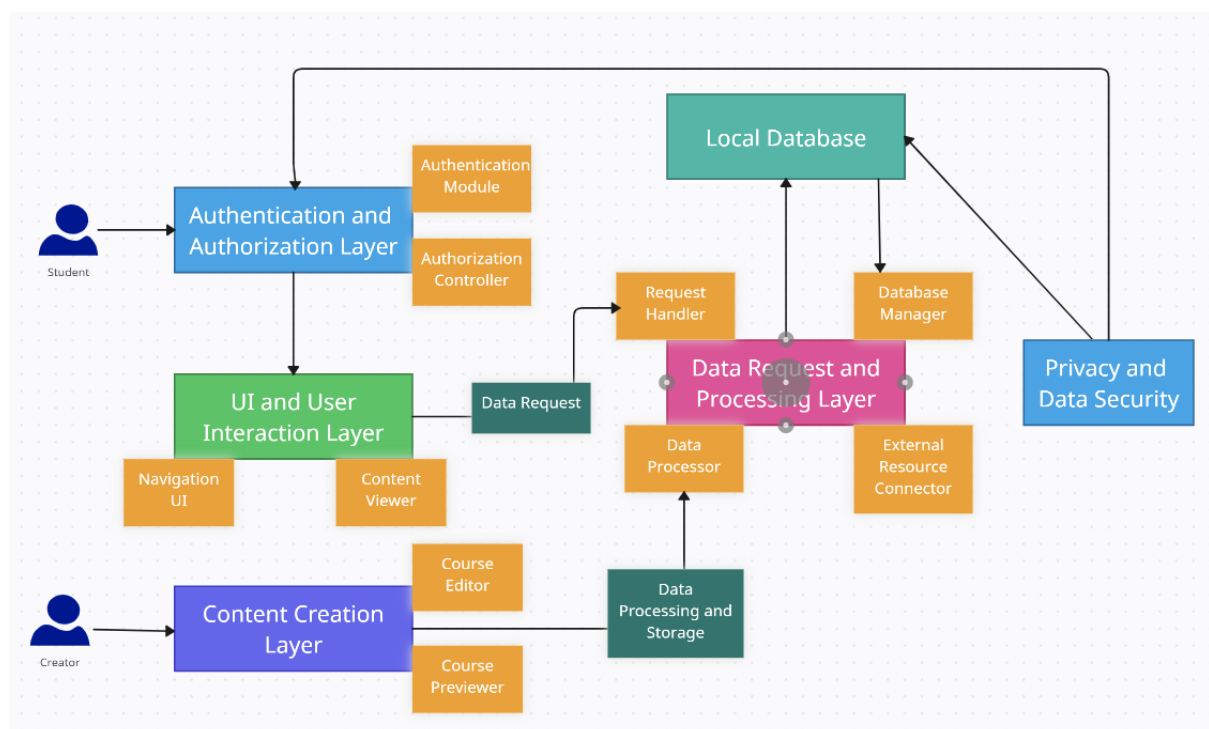


Figure 1: Architecture and data flow of the owl-m educational app