6CS027 – Secure Mobile Application Development

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1. Project Plan for the Development of the App

1.1 Project Overview

- **Project Name:** “Blogger” App
- **Project Description:** An Android app designed for creating, saving, and publishing blog content with fundamental CRUD functionalities. The application enables users to generate fresh blog entries by uploading text and images, check out a overview of all blog entries, modify and remove existing posts, search for particular posts, and distribute posts on other applications.
- **Objective**: To develop a user-friendly mobile app that provides a platform for users to easily manage their blog posts on their Android devices.

1.2 Project Scope

- **Create Blog Posts:** Users can create new blog posts by entering text and uploading images.
- **View Blog Posts:** Users can view a list of all blog posts in a scrollable format.
- **Edit Blog Posts:** Users can update the content of existing blog posts.
- **Delete Blog Posts:** Users can delete unwanted blog posts.
- **Search Functionality:** Users can search for specific blog posts by name or content.
- **Share Blog Posts:** Users can share their blog posts via other apps like email, messaging apps, or social media.

1.3 Timeline & Milestones

- Day one and two:
    - Requirements Collection: Determine the major requirements of the application.
    - Design wireframes and layout for the app as the initial step.

    - Create Project Repository: Start a Git repository to handle the source code.
    - Establish the basic project framework in Android Studio, incorporating essential libraries and dependencies.
- Third and fourth days:
    - Create Simple UI Designs: Build the primary user interface components like the main page, screen for creating blogs, and screen for displaying blog lists.
    - Establish SQLite Database: Create and execute the SQLite database structure for storing blog post information.
    - Performing CRUD Operations: Implement fundamental features for creating, viewing, editing, and removing blog posts.
- Fifth and sixth days:
    - Functionality for uploading images should be added to enable users to include images with their blog posts.
    - Create a search feature that allows users to locate particular blog entries.
- Seventh day:
    - Enable the option for users to share blog posts through other applications by incorporating sharing functionality.
- Eighth day:
    - Testing and Bug Fixing: Perform thorough testing to detect and resolve any bugs, guaranteeing the smooth functioning of the application.
    - Documentation and Final Touches: Finalize the project documentation and make any last changes to the app.

2. Software Design Document (SDD)

2.1 Introduction

The Software Design Document (SDD) is meant to serve as a Blogger App comprehensive guide to all development, detailing all architecture, components, and design decisions made for its application. The document is expected to make sure that even stakeholders have a full understanding on how the system is designed therein, thereby making it easier to develop and maintain in days to come.

Purpose: The primary objective of this paper is to offer a comprehensive design of the Blogger app. This covers the design of user interface (UI), database schema, core functionalities as well as interactions among different components. The document helps

developers on how to construct and bring together different parts of the app in order to have consistency and coherence in the final product through explaining these aspects.

Scope: SDD showcases all aspects of the app's design, from high-level architectural overviews to detailed class and sequence diagrams. This includes:

- **High-level architecture:** Describes the overall structure of the app and its main components.

- **Detailed class diagrams**: Illustrate the relationships and interactions between different classes in the app.

- **Sequence diagrams:** Show the flow of operations and interactions within the app.
- **Database design:** Provides the schema and structure of the SQLite database used for storing blog posts.

- **User interface design:** Outlines the layout and functionality of the app's UI components.

2.2 System Overview

The purpose of the Blogger App is to help users effectively control their blog posts. It has the ability to execute the following tasks:

1. Generate Blog Posts: Users have the ability to compose fresh blog posts by inputting text and uploading images. The application offers an easy-to-use and user-friendly design for making content.
2. See Blog Posts: Users have the ability to view a collection of their blog posts presented in a scrollable layout. Every post is condensed with a heading and a small image.
3. Revise Blog Posts: Users have the ability to revise the content of current blog posts by making changes to text and images as necessary.
4. Remove Blog Posts: Users have the ability to delete blog posts they do not want from their list.
5. Find blog posts by typing keywords or phrases in the search function provided by the app.
6. Users have the ability to distribute their blog posts via various applications like email, messaging apps, or social media using Android Intents for easy content sharing.
7. System Context: The Blogger App is made for use on Android devices, utilizing the platform's features for local storage and integration with other apps.
8. communication. The app interacts with several key components and systems within the device:

9. The application utilizes an SQLite database for storing blog post information directly on the user's device. This guarantees that users are able to reach their content even in offline situations. The structure of the database is created to effectively manage create, read, update, and delete tasks for blog posts, which involve both text and image information.

10. The application makes use of Android Intents for making it easier to share blog posts with other apps on the device. This enables users to effortlessly distribute their content through email, messaging apps, and social media platforms. Using Intents guarantees seamless integration of the app with other services and apps on the Android device.

11. User Interface: The UI is created to offer a user-friendly experience, with easy-to-use navigation and clear, accessible design elements. The key elements of the UI consist of the primary display (which features a list of blog posts), the blog editing/creation display, and the search feature.

Architecture of the system:

1. Presentation Layer encompasses user interface elements such as activities and fragments responsible for managing user input and showing information.
2. Business Logic Layer: Includes the fundamental operations of the application like making, modifying, removing, and distributing blog posts. This layer communicates with both the presentation layer and the data layer.
3. Data Layer: Handles storage and retrieval of data. It consists of the SQLite database and the DatabaseHelper class that executes CRUD operations.
4. The app relies on various Android libraries and SDKs for tasks like managing images, databases, and user interface elements.

3. System Architecture

3.1 Architecture Diagram

The following architectural diagram gives a summary of essential app elements and how they interact with each other.

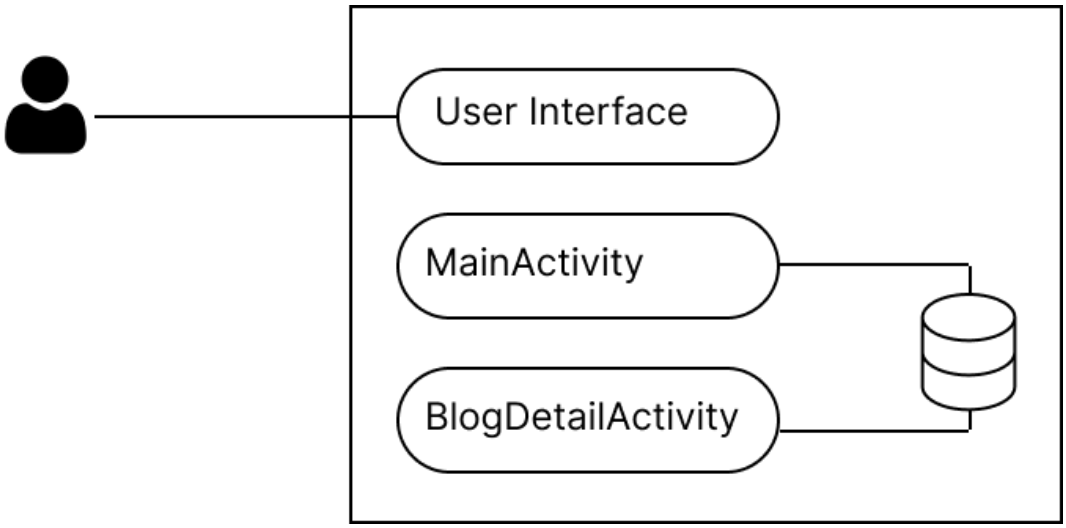

Figure 1.1 Architecture diagram

3.2 Use Case Diagram

The following displays the user and user roles available within the app.

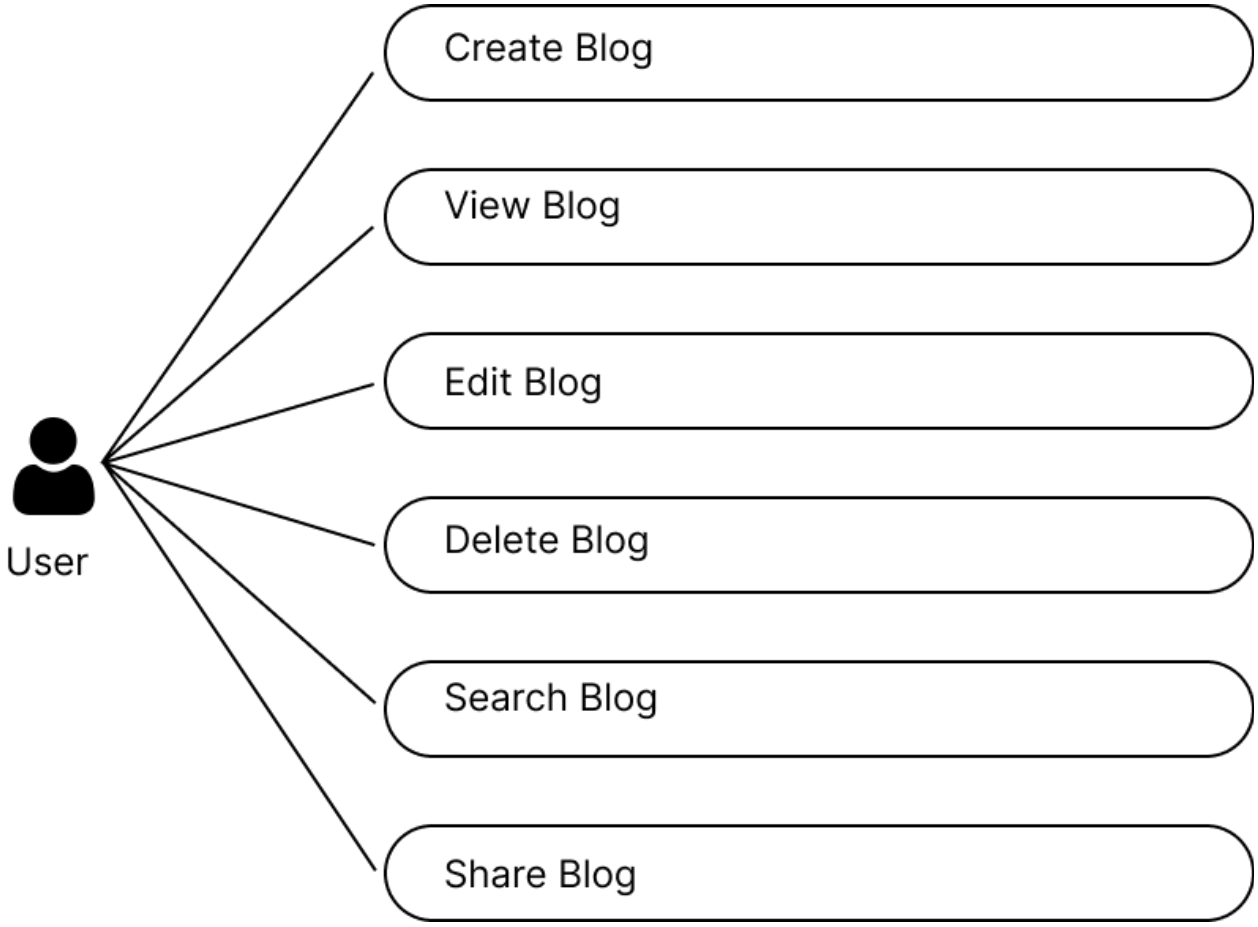

Figure 1.2 Use case diagram

3.3 Class Diagram

The class diagram details the Blogger App's components interaction, ensuring a structured and manageable codebase.

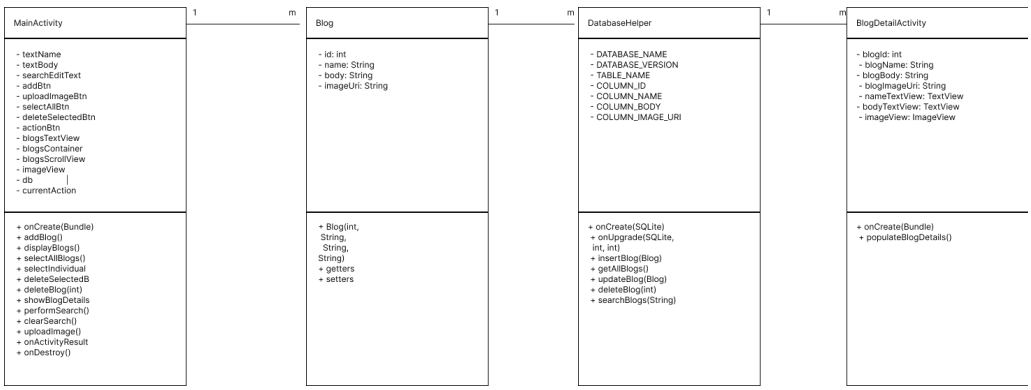

Figure 1.3 Class diagram

3.4 User Interface

- Main Display:This serves as the main hub of the application where users can view a summary of their blog posts.
- Characteristics:List of Blogs: Shows a scrolling list of blog entries, each presenting a title, excerpt of the content, and a small image.
- New Blog Button: Positioned in a prominent location, this button directs the user to the Blog Creation Screen.
- Search Bar: Located at the top, enabling users to search for particular blog posts efficiently using keywords.
- Select All Button: Allows users to choose all blog posts simultaneously for mass deletion.
- Button for Deleting Selected Items: Makes it easier to remove selected blog posts.
- Screen for creating a blog: This screen enables users to generate a fresh blog entry.
    - Characteristics:
        - Title Input Field: A field where the blog title can be typed in.
        - Input Field Content: A spacious text area designed for composing blog content, enabling input across multiple lines.
        - Thumbnail Image Upload Button: A feature for uploading a small image for the blog, which triggers the device's image picker.
        - Save Button: Stores the newly created blog post in the database.
- Screen for viewing individual blog posts.
- Description: Offers a detailed look at one specific blog entry.
- Characteristics:
    - Title Presentation: Displays the blog's title prominently.
    - Display of all the blog content in its entirety.
    - Image Display: Displays the image that has been uploaded, if there is one.
    - Edit Button: Takes you to a page where you can modify the blog post.
    - Delete Button: Removes the blog post once the user confirms.
- Screen for searching:
    - Description: Permits users to search for particular blog entries.
    - Characteristics:
        - Search Bar: An input field for users to enter keywords and search for blog posts.
        - Results of the search: A dynamic display of blog posts that match the search criteria, updating as the user types.

4.Implementation

- **Main class:**

    - Function: Serves as the main coordinator for user engagements concerning blog administration.
    - Operations:
        - Creating a blog: Offers a platform to enter fresh blog information and store it in the database.
        - Show Blogs: Fetches and exhibits all blog entries stored in the database.
        - Remove Blog Posts: Enables the removal of chosen blogs, with corresponding modifications made to the user interface and database.
        - Interacting with the database involves utilizing DatabaseHelper to execute CRUD actions on the blog database.
        - Image Upload: Implements the process of uploading images and showing them on screen.
        - Activity that displays detailed information from a blog.
- Role: Responsible for overseeing the in-depth examination and modification of a particular blog entry.
    - Roles:
        - Show Blog Information: Retrieves and displays the complete text of a chosen blog entry.
        - Edit Blog: Offers a platform to alter the content of the blog post and store any revisions.
        - Remove Blog: Provides a function to eliminate the existing blog entry from the database.
- Helper class for managing databases.
    - Function: Acts as the connector between the application and the SQLite database.
    - Operations; roles or tasks.
        - Creation and enhancement of database schema is managed by Database Creation and Upgrade.
        - Operations for Creating, Reading, Updating, and Deleting data.
        - Blog Insertion: Introduces fresh blog posts into the system.
        - Blog Update: Edits already published blog posts.
        - Remove Blog: Eliminates blog posts from the database.
        - Retrieve blog posts from various sources using specific criteria like keywords.

Environment for development:

- Android Studio is an integrated development environment designed for creating Android apps, offering features for writing, testing, and debugging code.
- Computer code language:
    - Java is the main programming language utilized for creating Android apps, providing a wide range of libraries and assistance for developing mobile applications.

- SQLite is a compact database engine that operates without a separate server process, making it well-suited for mobile apps.
- Tools for designing. (figma)

4. Glossary

CRUD:

Create, Read, Update, Delete: Fundamental operations for interacting with database records.

UI:

User Interface: The visual elements through which users interact with the app, including buttons, text fields, and layouts.

UX:

User Experience: The overall experience of a person using the app, focusing on how easy and pleasant it is to use.

SQLite:

Lightweight Database Engine: A self-contained, serverless, and zero-configuration database engine, widely used in mobile applications for local data storage.