成都理工大学中英合作办学
CDUT Sino-British Collaborative Education

OXFORD BROOKES UNIVERSITY

UNDERGRADUATE PROJECT PROPOSAL

Project Title:	**App-Recipe Management and Meal Planning System**
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1 Introduction

1.1 Background

Healthy eating can help prevent, postpone, or relieve the symptoms and problems associated with chronic illness, making it one of the most important methods for treating these disorders [1]. Amiri and Li [2] suggested that by encouraging a diet high in fruits, vegetables, whole grains and low in saturated fat, meal planning can assist people with heart disease in reducing their risk of high blood pressure. This indicates that meal planning is very important to the public, especially for people with these diseases. But meal planning is difficult for people who want to try new cuisines, or people who only have short time to cook. They want more recipes that meet their needs. Punamiya [3] found the solution is a recipe application that will offer people recipes based on the food they already have, and it will reduce the time and cost of purchasing these foods. The application has a database of food recipes that the user can search through. What is most important is that users can choose the different types of recipes with some conditions.

But meal planning and recipes are huge data to store. According to Sharma's [4] article, unlike file systems, database management systems (DBMS) have the advantage of stronger security, supporting concurrent access by multiple users without any problems and more advantages. And compared with the web, mobile applications are convenient because users only need a few taps on their smartphones.

Combining the above parts, this project develops a DBMS based on a mobile application. The DBMS provides a repository for storing recipes and organizing meal planning. Many people will benefit from this system. People who want to try new dishes can search for different types of food in this system, and for those who only have a short time, they can search for recipes based on time conditions. Meanwhile, users can also create meal plans for a specific duration. After the user specifies a meal plan, a shopping list will also be generated.

1.2 Aim

Develop a database management system for storing recipes and planning meals on the mobile platform.

1.3 Objectives

(1) Complete background check of existing DBMS.

(2) Complete detailed planning and design of various modules.

(3) Implement the functions of each module.

(4) Test each module using testing software.

(5) Show works for audiences.

1.4 Project Overview

1.4.1 Scope

Recipe Management and Meal Planning System is a mobile application. This application will provide users with a repository to help them store recipes and organize meal plans. The application allows users to add and edit their own recipes. It can also help users choose different recipes based on different conditions. Users can make a meal plan for a specific duration and generate a shopping list accordingly.

This app is a database management system that provides a repository. DBMS uses complex data models to represent data structures with minimal data redundancy. And it has high data and program independence.

1.4.2 Audience

This application is suitable for people who need to manage their diet. Not only for those with chronic diseases, but also for those who exercise and have stricter dietary control. Meanwhile, for those who want to try new dishes, this application can provide them with a richer menu.

2 Background Review

Many professional companies have provided existing technologies and resources to developers. “Yon-Builder” [5], a mobile development platform, provides a more powerful app engine for making app development easier. On the other hand, “Developers” [6] provides development learning and training courses for Android

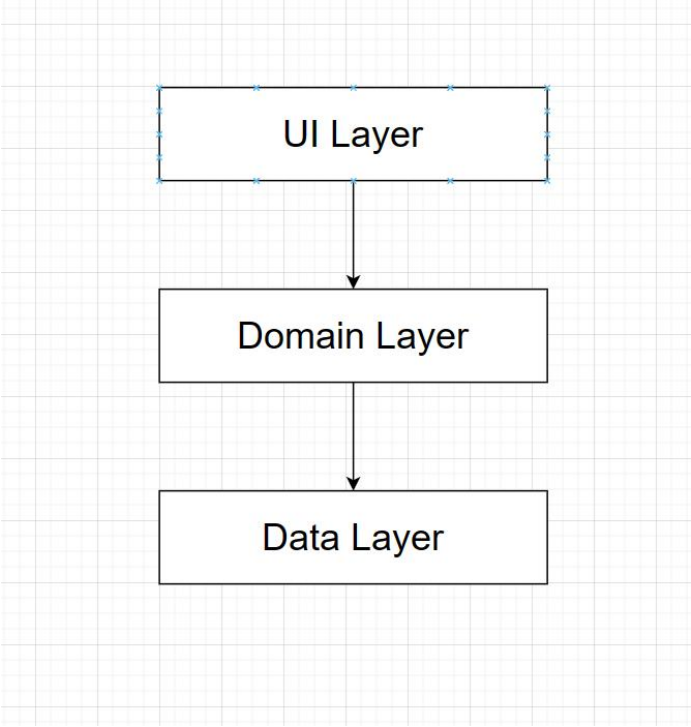
applications. These courses have helped many people successfully build Android applications. These developments are based on Jetpack package, Compose package, and Kotlin language.

Based on the existing technologies mentioned above, the development of this project will be simpler. This project can flexible applications of various frameworks, which means it has strong scalability.

3 Methodology

3.1 Approach

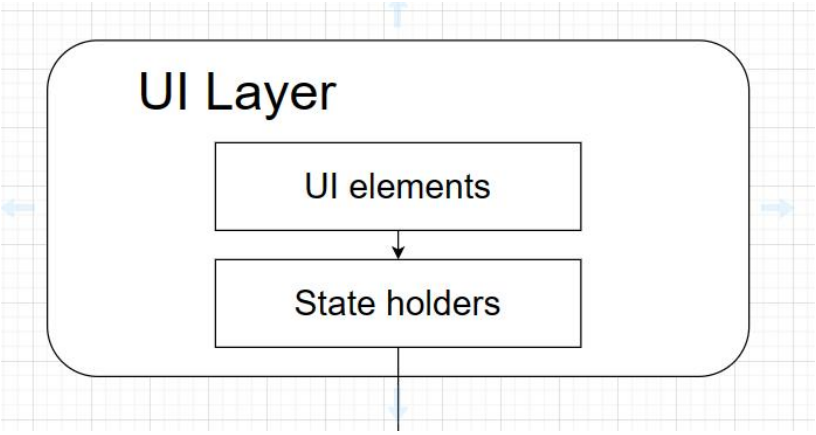
1) This project will use application architecture to divide the app into three parts, as shown in Figure 1:



(Figure 1 Application architecture.)

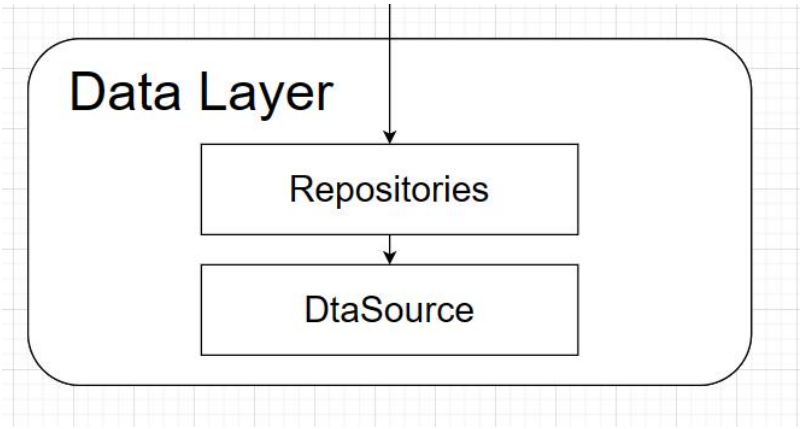
a) User interface (UI) Layer: The function of the UI layer is to display application data on the screen. Whenever data changes, whether due to user interaction or external input, the interface should be updated to reflect these changes.

The UI Layer consists of the two parts, as shown in Figure 2:



(Figure 2: Components of UI Layer.)

b) Data Layer: The data layer consists of multiple warehouses, each of which can contain zero to multiple data sources, as shown in Figure 3.



(Figure 3: Data Layer.)

c) Domain Layer: The Domain Layer is an optional layer between the interface and data layers. The Domain Layer is responsible for encapsulating complex business logic or simple business logic that is reused by multiple ViewModels.

2) Test:

A) Basic test:

1) Unit testing for ViewModel or Presenter.
2) Unit testing for the data layer. Most data layers should be platform-independent.

3) Unit testing for the domain layer.

B) UI Layer test:

1) Screen interface testing examines key user interactions within a single screen.
2) Navigation testing: These tests can simulate the user completing the navigation process.

3.2 Technology

1) Hardware: Lenovo y7000p.
2) Software: Android-Studio, Visual Studio, NoSQL.
3) Operating system: Windows 11.
4) Program Language: Structured Query Language (SQL) + Java + Kotlin.
5) Interface development: Jetpack Compose.
6) Package: Jetpack Compose, Android SDK.
7) Database: NoSQL with frame ObjectBox.

3.3 Version Management Plan

Choose the tool Gitee to store code for different versions of the project. When each version of the code is completed, the result will be uploaded to Gitee.

Gitee repository: https://gitee.com/Tao-Lv/project

4 Project Management

4.1 Activities

Step 1: Search for information about database management systems through academic websites like IEEE Xplore and review the knowledge such as Bilibili or CSDN.

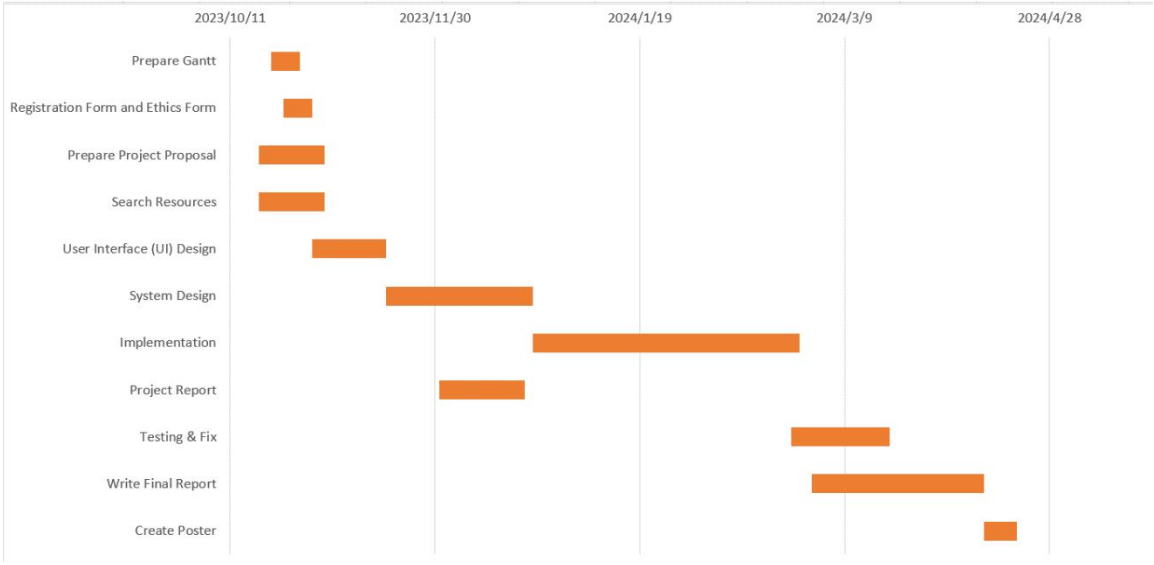
Step 2: Design the user interface.

Step 3: Detailed planning and design of various modules of the system.

Step 4: Implementation code of each module by using a developing software.

Step 5: Use test tools to test all the codes. Find bugs and fix them.

4.2 Schedule



(Figure 4: Gantt chart for project.)

4.3 Data Management Plan

This project will use Baidu Cloud to store and manage all the project documents and data files, as shown in Figure 5. Baidu Cloud can store files in any format.

Project link: https://pan.baidu.com/s/1ViojcCYyakn5xWJBcqolEQ?pwd=7oom

(Figure 5: Project list in Baidu Cloud).

4.4 Project Deliverables

1) Project proposal.
2) Weekly Reports.
3) Progress Report.
4) Final Report.
5) Project Code.

6) Project Software.
7) Presentation PPT.

5 References

[1] H. Cena and P. C. Calder, 'Defining a Healthy Diet: Evidence for the Role of Contemporary Dietary Patterns in Health and Disease', *Nutrients*, vol. 12, no. 2, Art. no. 2, Feb. 2020, doi: 10.3390/nu12020334.

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