COMSATS University Islamabad,
Abbottabad Campus

Project Proposal

(SCOPE DOCUMENT)

For

<SmartKitchenGreen>

Version 1.0

By

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Bachelor of Science in Computer Science (2021-2024)

SCOPE DOCUMENT REVSION HISTORY

No.	Comment	Action

Supervisor Signature

Date:

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Project Category: (Select all the major domains of proposed project**)**

○ **A-**Desktop Application/Information System ○**B-**Web Application/Web Application based Information System ○**C-** Problem Solving and Artificial Intelligence ○ **D-**Simulation and Modeling ○ **E-** Smartphone Application ○ **F-**Smartphone Game ○ **G-** Networks ○ **H-** Image Processing ○Other (specify category) _____

Abstract

SmartKitchenGreen is an innovative app designed to merge kitchen and garden management into a unified, environmentally-friendly process. It enhances kitchen efficiency by scanning the products, managing the user's grocery list, reducing waste with expiry date alerts, connects kitchen appliance and suggests recipe videos based on existing supplies. For gardening enthusiasts, it provides tools for organizing vegetable plots and maintaining plant care schedules and suggest the best suited plants in specific season. This comprehensive platform simplifies household management while promoting sustainability, enabling users to optimize their food usage and gardening practices for a greener lifestyle.

Introduction

SmartKitchenGreen is a comprehensive app for transforming kitchen and garden management into a seamless, eco-friendly experience. It streamlines your kitchen by helping you manage inventory by scanning items, avoid food wastage through expiry date notifications, and discover recipes based on what you already have. For your garden, it aids in planning your vegetable plots and taking plant care. This all-in-one solution not only simplifies your life but also supports sustainable living habits by ensuring you make the most of your food and garden.

Problem Statement

While there are applications in the market that focus separately on kitchen inventory management and gardening advice, the unique proposition of SmartKitchenGreen lies in its comprehensive approach that bridges the gap between kitchen and garden. This synergy is designed to enhance the user experience by providing a seamless transition between managing what you grow and what you consume. Even if similar systems exist, the process of re-implementation is a valuable learning journey. It provides insight into the challenges and solutions involved in creating an app that serves dual purposes, highlighting the importance of user-friendly design, effective database management, and the integration of diverse functionalities into a cohesive platform.

Problem Solution for Proposed System

The SmartKitchenGreen software addresses the critical problem of food wastage and inefficient garden management by providing an integrated solution for managing kitchen inventory and gardening activities. The core objective of developing this system is to streamline the way individuals organize their kitchens and gardens, making these tasks not only more efficient but also eco-friendly. By alerting users to the expiry dates of their food items, suggesting recipe videos based on current inventory, and offering guidance for vegetable garden planning and care, SmartKitchenGreen aims to minimize waste and promote sustainable living practices.

Related System Analysis/Literature Review

Application Name	Weakness	Proposed Project Solution
MyFridgeFood	Primarily focuses on recipe suggestions based on current kitchen inventory without managing expiry dates or garden management.	SmartKitchenGreen integrates inventory management with expiry notifications, alongside garden management, offering a holistic approach to food sustainability.
From Seed to Spoon	Offers detailed gardening advice and plant care tips but lacks integration with kitchen or food inventory management.	By combining garden planning with kitchen inventory management, SmartKitchenGreen ensures that users can effectively use their garden produce in their cooking, reducing waste.
Paprika Recipe Manager	Excellent for recipe management and grocery planning but does not offer inventory tracking or suggestions based on expiry dates. Also lacks garden management features.	SmartKitchenGreen addresses these gaps by including expiry date notifications for inventory items and linking this inventory to recipe suggestions, while also managing garden produce.

Advantages/Benefits of Proposed System

Unlike the apps that focus solely on kitchen inventory or garden management, this app provides a holistic solution that integrates both. As mentioned in above, with features like expiry date notifications, the app directly addresses the issue of food waste. By alerting users to consume or utilize food items before they go bad, it reduces the amount of food discarded due to spoilage. Moreover the recipe discovery feature based on current inventory encourages users to make the most of what they already have. Also by Offering advice on vegetable planting and garden care, the system supports users in growing their own food sustainably. This advice includes when to plant certain vegetables and how to care for them. One other advantage is this that by facilitating garden management and linking it with kitchen inventory, the app empowers users to become more self-sufficient. Growing their own produce and efficiently using it reduces reliance on store-bought goods. Because of its User-Friendly Interface, This app aims to offer a simple, intuitive interface that makes managing kitchen and garden tasks enjoyable and stress-free.

Scope

SmartKitchenGreen is an android based application that has combination of kitchen management and garden management. In Registration and User Login, users create a personal profile using their email and password, and will be enabled to log in and access their kitchen and garden data. The Integrated Grocery Assistant, offers users the capability to keep a detailed list of kitchen items, including both perishables and non-perishables by scanning the products in kitchen, and tracks their availability, and expiry dates to maintain kitchen organization. There also maybe items that are unable to be scanned, in that case user can enter the item with its details using voice system. Third module introduces Expiry Date Notifications, a proactive feature that alerts users to products nearing their expiry dates, encouraging the use of these items to minimize waste. The Kitchen Appliance connects user with their kitchen appliance by providing the related informations about the kitchen appliance and helping them out in using the appliance. The Recipe Recommender module suggests recipe videos based on the users' current inventory using Artificial Intelligence, fostering creativity in the kitchen while utilizing ingredients that might otherwise go to waste. Vegetable Garden planning module enables users to plan their vegetable garden and plant arrangements with APIs recommendation that will suggest best suited vegetable to plant in specific season, facilitating better growth and productivity. The Digital Care Calendar, provides calendar using APIs for users to oversee their garden’s progress and schedule necessary maintenance tasks. Lastly, the Plant Care Information provides detailed information about plant care requirements, watering schedules and nutrition needs. Using APIs, it offers advice and recommendations for plant health. Together, these modules form a comprehensive tool designed to promote efficient and sustainable living through better kitchen and garden management.

Things that will not be a part of the project

The project sticks to helping with kitchen stuff and growing veggies, not delivering meals, tracking all your food's nutrients, or giving deep cooking classes. It'll suggest what to cook with what you have but isn't a full-on cooking app with tons of recipes or lessons. Also, it's all about growing food in your garden, not about decorating it with flowers or making it look fancy. It's really focused on making and eating food in a smart way

Modules

“SmartKitchenGreen” consists of following eight modules:

Module 1: Registration and User Login

Users sign up using their email and setting a password, creating a personal profile. Once registered, users log in to access and manage their kitchen and garden data.

Module 2: Integrated Grocery Assistant

This module allows users to keep a detailed list of all kitchen items, including perishables and non-perishables, by scanning the items or storing them using voice system in case they are unable to be scanned. It helps in keeping the kitchen organized by tracking what items are available, and their expiry dates.

Module 3: Expiry Date Notifications

To minimize food waste, the app alerts users about products that are nearing their expiry dates, prompting them to use these items first. This proactive notification system helps to avoid unnecessary waste.

Module 4: Kitchen Appliance

Connects user with their kitchen appliance. Pick the appliance you're using, and you'll get helpful tips and useful info about it.

Module 5: Recipe Recommender

Based on the current inventory, the app suggests recipe videos to users using Artificial Intelligence, encouraging them to make the most of what they already have. This not only fosters creativity in cooking but also further reduces food waste by utilizing items that might otherwise expire.

Module 6: Vegetable Garden Planning

Users can plan their vegetable garden and plant arrangement using APIs recommendations where they can decide when and which vegetable to plant for best growth according to specific season.

Module 7: Digital Care Calendar

The app provides a calendar using APIs to oversee garden’s progress and maintenance tasks.

Module 8: Plant Care Information

Users can access detailed information about their plants' care requirements, including watering schedules and nutrition needs. With the help of APIs it offers advice and recommendations to users to take better care of their gardens, ensuring plant health and productivity.

System Limitations/Constraints

Internet Connectivity Requirement: Some features of SmartKitchenGreen, such as real-time notifications for expiry dates and AI-powered recommendations, may rely on a stable internet connection. Users in areas with poor or limited internet access may experience difficulties in accessing these features, potentially impacting their overall experience with the application.

Cross-Platform Compatibility: Developing an Android-based application may limit accessibility for users who prefer other platforms such as iOS or desktop. Consideration should be given to developing cross-platform solutions or providing alternative access methods to accommodate a wider range of users.

Limited Personalization: The app may not fully adapt to individual user preferences, dietary restrictions, or specific garden conditions beyond the basic information provided by the user. This could result in less tailored recipe recommendations and garden planning advice, affecting user satisfaction and engagement.

Software Process Methodology

For the development of "SmartKitchenGreen" we have chosen Iterative Methodology. Iterative methodology is well-suited for this project due to several reasons. One of the reasons is its ability to accommodate and adapt to changes rapidly. The iterative method is flexible, allowing for easy updates or changes without starting over or causing big problems. This is different from other methodologies, where making changes can be hard and cause delays.

Tools and Technologies:

Tools	Version	Rationale
Visual Studio Code	2015	IDE for development
MS Word	2015	Documentation
MS PowerPoint	2015	Presentation
Gantt Chart Pro	Online	Project scheduling and management
Figma	Latest	Design work and mock-ups creation

Technology	Version	Rationale
Flutter	3.19.3	Cross-platform mobile framework
Dart	3.3.1	Programming language for Flutter
JavaScript	ECMAScript 2020 (ES11)	Programming language for web development
Python	3.9.7	Backend development
SQLite	Latest	Database Management
Node.js	24	Backend development

Project Stakeholders and Roles:

Project Sponsor	COMSATS University Islamabad, Abbottabad Campus
Stakeholder with their roles and responsibilities.	• Shams Ul Arifeen "SP21-BSE-076" (Project member) • M. Ijaz Ahmad Awan "SP21-BCS-071" (Project member) • Marzia "SP21-BCS-097" (Project member) • Users • **Project Supervisor**: Ma'am Qurat Ul Ain • **Final Year Project Committee:** Evaluation of project

Team Members Individual Tasks/Work Division

Student Name	Student Registration Number	Responsibility/ Modules
Shams Ul Arifeen	SP21-BSE-076	Module 1: Registration and User Login Module 2: Integrated Grocery Assistant Module 3: Expiry Date Notifications Module 4: Kitchen Appliance Module 5: Recipe Recommender Module 6: Vegetable Garden Planning Module 7: Digital Care Calendar Module 8: Plant Care Information

M. Ijaz Ahmad Awan	SP21-BCS-071	Module 1: Registration and User Login Module 2: Integrated Grocery Assistant Module 3: Expiry Date Notifications Module 4: Kitchen Appliance Module 5: Recipe Recommender Module 6: Vegetable Garden Planning Module 7: Digital Care Calendar Module 8: Plant Care Information
Marzia	SP21-BCS-097	Module 1: Registration and User Login Module 2: Integrated Grocery Assistant Module 3: Expiry Date Notifications Module 4: Kitchen Appliance Module 5: Recipe Recommender Module 6: Vegetable Garden Planning Module 7: Digital Care Calendar Module 8: Plant Care Information

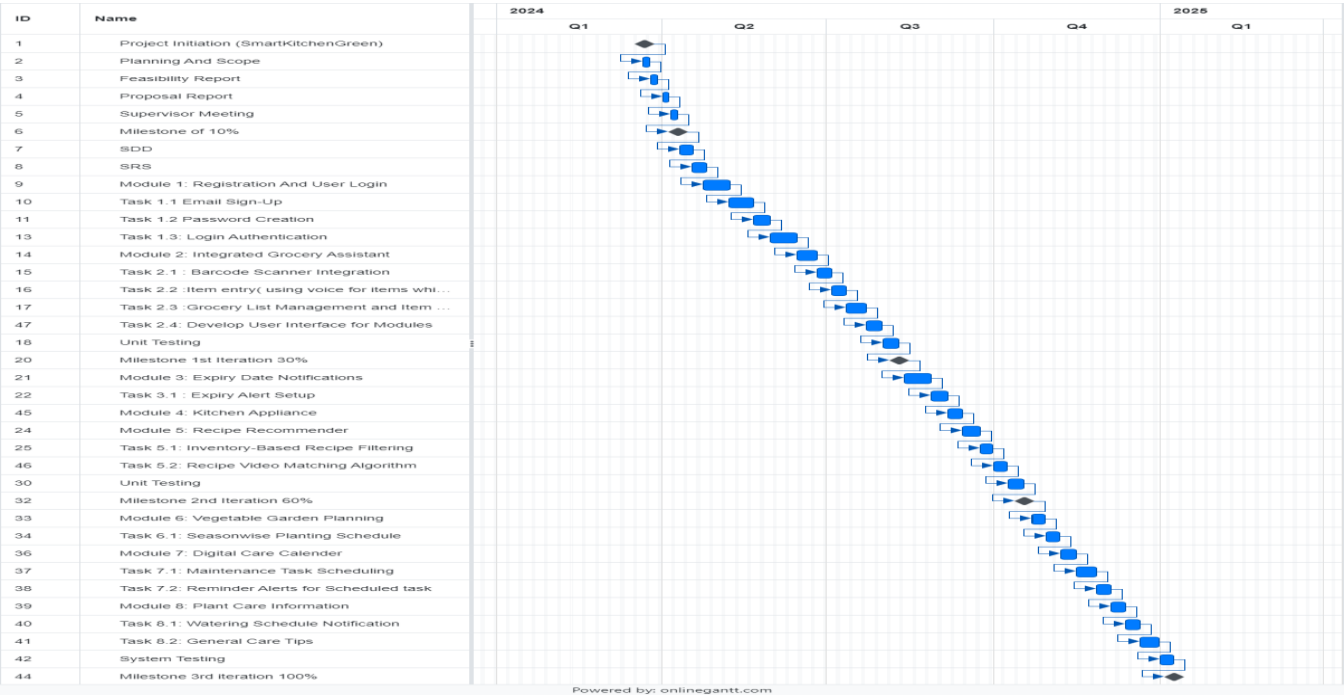
Data Gathering Approach

- Review of existing applications.

Concepts

- **Full Stack Development**: Frontend development with Flutter and Dart, backend with Node.js and JavaScript, and database management with SQLite.
- **Artificial Intelligence Integration:** Utilize Python for implementing AI algorithms and libraries to enhance SmartKitchenGreen's functionalities.
- **Database Operations:** CRUD (Create, Read, Update, and Delete) operations and schema design.
- **User interface (UI) and user experience (UX) Design:** understand the art of designing intuitive and user-friendly interfaces with Flutter.
- **Project Management:** Learn to manage a project from concept to deployment, including planning, time management, and task prioritization

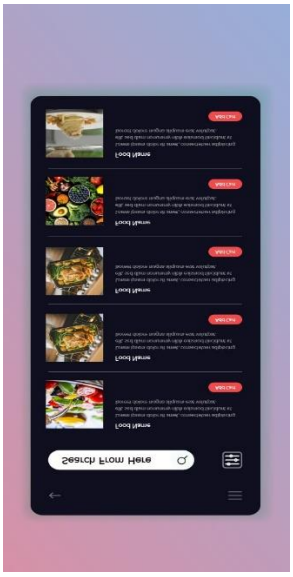
Gantt chart



ID	Name
1	Project Initiation (SmartKitchenGreen)
2	Planning And Scope
3	Feasibility Report
4	Proposal Report
5	Supervisor Meeting
6	Milestone of 10%
7	SDD
8	SRS
9	Module 1: Registration And User Login
10	Task 1.1 Email Sign-Up
11	Task 1.2 Password Creation
13	Task 1.3: Login Authentication
14	Module 2: Integrated Grocery Assistant
15	Task 2.1 : Barcode Scanner Integration
16	Task 2.2 :Item entry(using voice for items whi...
17	Task 2.3 :Grocery List Management and Item ...
47	Task 2.4: Develop User Interface for Modules
18	Unit Testing
20	Milestone 1st Iteration 30%
21	Module 3: Expiry Date Notifications
22	Task 3.1 : Expiry Alert Setup
45	Module 4: Kitchen Appliance
24	Module 5: Recipe Recommender
25	Task 5.1: Inventory-Based Recipe Filtering
46	Task 5.2: Recipe Video Matching Algorithm
30	Unit Testing
32	Milestone 2nd Iteration 60%
33	Module 6: Vegetable Garden Planning
34	Task 6.1: Seasonwise Planting Schedule
36	Module 7: Digital Care Calender
37	Task 7.1: Maintenance Task Scheduling
38	Task 7.2: Reminder Alerts for Scheduled task
39	Module 8: Plant Care Information
40	Task 8.1: Watering Schedule Notification
41	Task 8.2: General Care Tips
42	System Testing
44	Milestone 3rd Iteration 100%

Mock-ups

Dashboard **Grocery list** **Recipe Recommender** **Kitchen Appliance**



Conclusion

SmartKitchenGreen represents a significant advancement in harmonizing kitchen and garden management with sustainable living practices. This application not only simplifies daily routines but also actively contributes to reducing food wastage and promoting eco-friendly gardening habits. It is an all-encompassing solution that caters to the needs of modern, environmentally conscious individuals seeking to make a positive impact on their lifestyle and the planet.

References

- **Flutter Complete: by Alberto Miola.** Due to its thorough coverage of Flutter, including advanced topics not found in many other resources

- **Flutter awesome:** regularly updated and categorizes resources in a way that makes it easy for developers to find exactly what they need, whether they're looking for UI libraries or state management solutions.
  https://flutterawesome.com/

- **Dart.dev:**
  https://dart.dev/

- **Educative's "Learn Dart**:
  https://www.educative.io/

- **freeCodeCamp.org:**
  Visit freeCodeCamp

- **MDN Web Docs:**
  https://developer.mozilla.org/en-US/docs/Web/JavaScript

- **Learn JavaScript Online:**
  https://learnjavascript.online/

Plagiarism Report

To ensure the originality and integrity of the SmartKitchenGreen app project, a plagiarism check was conducted using specialized software. The following sources were reviewed during the plagiarism check:

- Pantry Check App: Pantry Check (No direct link provided, but you can search for it in the app stores or visit their official website).

- Out of Milk App: Out of Milk (No direct link provided, but available in app stores).

- KitchenPal: KitchenPal App

- MealBoard: MealBoard

- CozZo: CozZo

The plagiarism check results indicate that the content of the SmartKitchenGreen app project is original and does not contain plagiarized material from the referenced sources. The project provides unique insights, features, and functionalities tailored specifically for Kitchen and Graden management applications.