Malaysian Food Calorie Tracker

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ABSTRACT

This project is regarding a growing trend – Website Development. The process of building and managing websites is known as website development. It includes each detail from developing complicated web applications to designing a straightforward webpage. By choosing typical Malaysian foods, users of the Web-Based Malaysian Food Calorie Tracker can quickly record and keep track of their daily caloric consumption. In addition to helping users manage macros and create individual calorie goals based on their health objectives, the portal includes comprehensive nutrition information. Its user-friendly design promotes Malaysia's various culinary traditions while encouraging healthy eating practices. This project focuses on the development of a web-based calorie tracker for Malaysian in Malaysia. Personal health and nutrition awareness are becoming more and more important, specifically customized for local dietary habits in Malaysia. As wellness awareness increases globally, many Malaysians find it difficult to track their daily calorie intake because there aren't many localized and culturally relevant tools available. Most calorie tracking applications that are currently available are designed for Western diets and frequently ignore Malaysian cuisine, which leaves local users with inaccurate or incomplete data. This project addresses localization and user-friendliness as two major issues. Since many health monitoring applications don't support Malaysian foods and are hard to use for people who aren't familiar with nutrition tracking, there has been an obvious need for a comprehensive and culturally relevant solution. After conducting the research and analysis, many current platforms, including MyFitnessPal, health.family.my, and Channel News Asia's Calorie Calculator, in order to determine their advantages and disadvantages. A more specialized solution—a webbased Malaysian Food Calorie Tracker— is suggested considering this research. Users of the app can log their daily intake, look for different cuisine in food databases, read comprehensive nutritional data, and get tailored suggestions. The system provides a clear, user-friendly interface by utilizing dynamic web technologies and relational databases. By making nutritional tracking simple, relatable, and accessible to all Malaysians, the finished product seeks to promote healthy living.

Area of Study (Maximum 2): Website Development, Health & Nutrition Keywords (Maximum 5): Nutrition, Calorie Goal, User Interface, Malaysia Dishes, Dietary Habits, Calorie Intake

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LIST OF ABBREVIATIONS

RAM Random Access Memory

Chapter 1

Introduction

People are increasingly using digital technologies for promoting healthier lifestyles in today's health-conscious society, especially when it comes to controlling their nutrition and dietary habits. Applications for tracking calories have become more and more popular because of their capacity to measure food consumption and encourage wise eating choices. [1] But a lot of these systems were created mostly with Western eating habits in mind, and they frequently ignore the variety of cuisines seen in other countries, including Malaysia. The absence of localized data in current health apps is a major usability issue for Southeast Asian consumers, as noted by [2]. Malaysian cuisine, which is recognized for its diversity and cultural depth, presents a special challenge because its ingredients and preparation techniques are complicated and are not commonly listed in international food databases. Apart from the problem of localization, another common barrier in current platforms is the design of the user interface. According to studies, ease of use and simplicity are essential for promoting sustained use of health-related applications, particularly by inexperienced users [3]. Users become frustrated and give up using the application as a result of complicated navigation, a bad user experience, and minimal cultural relevance. Therefore, a customized solution that fills in these gaps and provides Malaysian users with an interesting, easy-to-use experience is certainly needed. The goal of this project is to create a web-based Malaysian food calorie tracker that prioritizes usability and cultural relevance. A thorough, locally curated food library will be included of the app, enabling users to look up Malaysian recipes and obtain precise nutritional data including calorie, protein, carbohydrate, and fat intake. Users will also be able to record their meals, monitor their daily consumption, and get tailored feedback according to their own dietary objectives. To increase accessibility and engagement, the system was developed with simplicity in mind, according to user-cantered design principles [4]. In conclusion, the first section of this report reviews the available calorie tracking systems and related research to assess their advantages and disadvantages. The suggested development approach, including the frameworks and technologies employed, is then described. A summary of the project's results and suggestions for future improvements and broader implementation are included at the end of the sections that follow, which also showcase the initial work completed during the initial planning phases.

1.1 Problem Statement and Motivation

1. Cultural Food Database Gap

Malaysian users who eat culturally unique meals like nasi lemak, rendang, and roti canai—which differ significantly in ingredients, preparation techniques, and nutritional value from international databases—face major obstacles because the majority of the food items featured in the nutrition tracking applications currently in use are Western. Due to this disparity, users are forced to manually calculate nutritional values or use inappropriate substitutes to approximate their meals. This results in inaccurate dietary tracking and decreased use of nutrition management tools, which ultimately impedes effective health monitoring in an area where obesity and diabetes rates are on the rise. Additionally, users may be discouraged from sticking to their cultural food preferences in order to maintain accurate nutrition tracking.

2. User Experience Complexity Barrier

It is challenging for users to accurately track caloric intake, consistently record food intake, and sustain an ongoing relationship with their dietary goals due to the complicated navigation systems and poor user interface design of current nutrition tracking applications. Numerous platforms currently in use frustrate users with complex interfaces, require numerous steps to log simple meals, lack user-friendly food item search functions, and offer dashboards that are confusing or poorly organized, obscuring crucial nutritional information. These factors ultimately result in user abandonment and unsuccessful dietary management attempts. Because of this usability gap, people are unable to achieve their nutritional goals and form long-lasting healthy eating habits because the tools that are supposed to assist them in their wellness journey end up being causes of frustration rather than empowerment.

3. Behavioral Insight and Goal Management Gap

Due to a lack of complete tools that offer continuous calorie tracking, tailored goal-setting capabilities, and significant behavioral insights into their eating patterns over time, many people suffer with sustainable weight management and healthy eating. Without providing users with the analytical tools necessary to identify eating triggers, comprehend consumption trends, identify nutritional deficiencies, or alter their dietary goals based on progress data, existing nutrition applications frequently concentrate on short-term calorie counting, leaving users unable to make long-lasting behavioral changes or make educated

decisions about their eating habits. People are unable to develop the self-awareness and long-term strategies required for long-term health improvement when tracking, goal management, and behavioral monitoring are not combined, which frequently leads to repeated dieting patterns and abandoned wellness initiatives.

4. Personalized Nutrition Guidelines

Users must continue to make difficult nutritional decisions without individualized guidance that supports their unique health goals and lifestyle patterns because current nutrition applications do not offer personalized dietary recommendations that take into account individual caloric needs, physical activity levels, and metabolic requirements. Inappropriate food recommendations can result in inadequate nutrition, excessive caloric intake, or meal plans that don't fit users' energy demands and fitness routines. This is because the majority of current platforms provide generic meal suggestions or recipe databases that disregard users' daily energy consumption, activity level, food preferences, and personal health objectives.

1.2 Objectives

1.2.1 To develop a comprehensive food database that suited to Malaysian eating preferences.

The creation of an extensive food database tailored to Malaysian dietary preferences is the project's primary goal. Nowadays, a lot of food monitoring apps rely on foreign databases that mostly highlight Western cuisines, frequently disregarding Malaysian local cuisine and unique local meals. This project intends to guarantee that users may precisely record meals that represent the many culinary customs of Malaysia by creating a specialized food database. In order to ensure that the database contains frequently consumed foods like nasi lemak, roti canai, asam pedas, and others, this requires collecting nutritional data for a broad range of regional specialties. Facilitating consumers' ability to monitor their food consumption in a culturally appropriate setting is the aim.

The system's extensive food database will be an essential aspect, allowing users to choose, record, and track their meals using well-known Malaysian recipes. Each food item's calorie counts and macronutrients (proteins, fats, and carbs) will be recorded by the system. This comprehensive nutritional information will be available in an understandable format and updated frequently to guarantee accuracy. Users will be able to make educated dietary selections and monitor their progress toward their nutrition and health objectives according to

this database, which eliminates the requirement for general food entries that might not accurately represent the contents of regional meals.

1.2.2 To create an intuitive web application that facilitates smooth navigation, enabling users to record their meals, monitor calorie consumption, and effectively manage their dietary objectives.

The following objective is to develop a web application that is easy to use and straightforward, allowing users to measure their calorie intake, record their meals, and efficiently manage their dietary goals. The goal is to create a simple, clear interface that makes it easy for people of all ages and technical skill levels to use the system. With the ability to begin searching for meals from the extensive database, choose portion sizes, and check nutritional breakdowns, the web-based will offer a simple meal reporting process. The application's focus on usability and simplicity will motivate users to regularly record their meals and continue participating in the tracking process.

By enabling users to easily measure their daily caloric intake and nutritional progress, this goal seeks to make meal management and calorie tracking as easy as feasible. Important information will be shown on the user interface, including the overall number of calories consumed, the number of calories left to accomplish their target, and a graphic representation of their nutritional intake. Additionally, it will have tools to monitor development over time and modify according to the user's dietary objectives. Users will have the ability to make knowledgeable food choices with this web-based, which will enable them to more effectively manage their nutrition and health goals.

1.2.3 To enable individuals to track their calorie consumption throughout time, establish nutritional objectives, and gain insights into their eating behaviours to promote sustainable healthy habits.

In order to encourage long-lasting, healthful habits, the third objective is to give people the ability to monitor their caloric intake over time, create customized nutritional goals, and acquire knowledge about their eating patterns. Users will be able to set and monitor particular dietary goals, such as macronutrient balances or daily calorie targets, using the system. The system would assist users in maintaining focus on their health goals and making necessary adjustments by giving them frequent updates on their calorie consumption and nutritional balance. This long-term tracking function provides users with clear, useful feedback on their dietary choices and progress, with the goal of encouraging sustainable behaviours.

The system will produce thorough reports and visual performance updates, including charts and graphs, that illustrate patterns in nutrient intake and calorie consumption over a period of weeks. Users will gain a better understanding of their eating patterns and pinpoint areas for development with the use of these insights. Users will be able to make educated judgments and progressively switch to healthy eating habits thanks to the system's ongoing, long-term review of their nutritional patterns. This feature encourages users to maintain consistency with their nutritional objectives while allowing flexibility and adjustments with time, so supporting the creation of sustainable health habits.

1.2.4 To create a system that recommends recipes and food selections tailored to users' daily consumed calories and levels of physical activity to encourage healthier eating habits.

This objective is to develop a system that can suggest recipes depending on users' daily caloric intake, physical activity levels, and food intake. The system may detect nutritional deficiencies, excesses, or imbalances by examining users' past food intake. It can then recommend better substitutes or supplementary meals to assist users in reaching their dietary objectives. In addition to offering calorie-management advice, this method makes sure that users get a balanced diet that includes protein, carbs, fats, and other vital elements while accounting for their individual activity levels and energy needs.

The system aims to promote healthier eating habits by offering recipes and food choices that are balanced in nutrients and in line with users' individual health objectives, going beyond mere calorie tracking. The approach prioritizes variety, accessibility, and practicality over cultural relevance, providing options that are simple to prepare and flexible enough to accommodate a range of dietary requirements. It assists users in making better eating choices without interfering with their normal routines by offering healthier options and educating them about portion control. In the end, this approach combines actionable, daily meal choices with tailored nutrition guidance to assist users in creating lasting eating habits.

1.3 Project Scope and Direction

The goal of this project is to develop a web-based Malaysian Food Calorie Tracker that will assist users in tracking the number of calories and nutrients they consume each day depending on the local cuisine. The main task is to create and implement use an intuitive platform that enables people to look up, keep in mind and monitor the nutritional content of both modern and traditional Malaysian foods. Key elements including calories, protein, carbs, fats, and serving size per meal will be the main focus of the system. To assist users in keeping track of

their meals, the platform will feature a graphical dashboard, display meal that user consumed, and a customized daily record. The system will be built to cope with future growth in terms of functionality and database entries, and a centralized database will be created to contain nutritional data for a variety of Malaysian cuisines.

1.4 Contributions

In order to address the dearth of genuine local food data in current health applications, the Malaysian Food Calorie Tracker system is an all-inclusive, culturally aware calorie tracking platform designed specifically for Malaysian cuisine. In order to promote healthy lifestyle choices, it incorporates a food database with precise nutritional data, sophisticated calorie calculating, real-time notifications, and community elements. In addition to tracking health, the system supports healthy adaptations while preserving local food knowledge, integrates dual user-admin interfaces for efficient administration, and offers a scalable framework that may be expanded to other Southeast Asian nations. The platform's community-driven data collecting, analytics dashboards, and healthcare-ready features enable people to make educated food choices while simultaneously acting as a research tool for examining cultural impacts on health behavior.

1.5 Report Organization

The details of this project are shown in the following chapters. In Chapter 2, some related background and similar systems are reviewed. The strengths and weaknesses from existing systems have been identified. Solutions to resolve the identified weaknesses of similar systems and a table of comparison between similar systems with the proposed system are discussed in the chapter. Then, Chapter 3 presented the methodology, System Architecture Diagram, Use Case Diagram and Description, and Activity Diagram. The next section, Chapter 4, presented the Block Diagram, System Components Specifications, and ERD Diagram of the proposed project. Chapter 5 included the setup of hardware and software, setting and configuration for project implementation, system operation and implementation challenges. In the continuous part, Chapter 6 has covers on the project challenges and objectives evaluation to rate how well the proposed purposes are being achieved at the end of the development. Last but not least, Chapter 7 concluded the entire project and recommendations that can be incorporated to further enhance the system performance.

Chapter 2

Literature Review

In this chapter, relevant literature will be conducted on existing calorie tracking systems will be reviewed. During the literature review, these existing platforms were found to provide a number of helpful features and capabilities, such as setting objectives function, macronutrient breakdown, calorie tracking, and meal logging. In order to raise user awareness and enhance health results, some systems additionally include extra features like body weight tracking, recipe recommendations, and heart rate tracking. Additionally, the distinctions between each of these systems' features and attributes were investigated to emphasizing their distinct advantages and disadvantages.

A number of existing platforms, including MyFitnessPal, health.family.my, and Channel News Asia's Calorie Calculator, have been examined and evaluated in order to identify and clarify the fundamental system needs and user behaviours that may affect the perceived benefit of a calorie tracking platform. These systems were examined to determine both their main benefits and functional limitations. For example, worldwide systems may lack native support for Malaysian meals, but they usually support an extensive food database and accurate analytics. However, local systems typically have restricted features and a static user interface, even though they could have cultural value.

The results of this reviewed of the literature form the basis for improving the suggested system. This project intends to provide a more user-centered and culturally adapted platform by recognizing the shortcomings of current systems, such as the absence of extensive Malaysian food data, restricted personalization tools, and less dynamic interfaces. By incorporating localized food data daily nutritional goal monitoring, and healthy recipe recommendations, the proposed Malaysian Food Calorie Tracker system will overcome these drawbacks and provide users with a more comprehensive and user-friendly dietary management experience.

In a nutshell, the knowledge gathered from the literature review aids in guiding the system's design choices and feature prioritization. The project can guarantee that the finished product satisfies actual user needs and encourages sustainable, health conscious behaviours among its users by recognizing customer demands and the functionalities missing from existing systems.

2.1 Critical Remarks of Similar Systems

2.1.1 MyFitnessPal

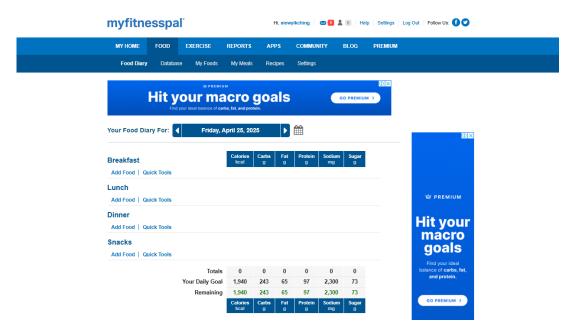


Figure 2.1.1.1 MyFitnessPal

Known for its comprehensive food database, workout tracking, and wearable device integration, MyFitnessPal is a well-known exercise and health tracking app on a global scale. It lacks localization for Malaysian consumers, despite having capabilities like barcode scanning, macronutrient tracking, and customized goal setting. Traditional Malaysian foods frequently lack comprehensive nutritional information, forcing users to manually enter food data, which might decrease accuracy and usability. Furthermore, the program doesn't offer dietary recommendations or healthy recipes that are appropriate for different cultures. These drawbacks underscore the need for a more specialized solution, such as the Malaysian Food Calorie Tracker which seeks to close these gaps by emphasizing regional food and user-friendly features unique to Malaysia. [5]

2.1.1.1 MyFitnessPal Function

MyFitnessPal provides a wide range of tools to assist users in monitoring their fitness and diet. In addition to having easy access to a comprehensive foreign food database, users can report a wide range of foods in their regular meal intake. Users may rapidly scan items of food for nutritional information using the app's barcode scanning feature. MyFitnessPal helps users gain insight into their nutrition by offering comprehensive macronutrient and micronutrient breakdowns in addition to meal monitoring. Individual tracking of activity, calorie intake, and fitness objectives is possible with the app. Users may also check their weight and water intake.

Logging in and out, as well as syncing data across devices, are among the account operations that users can control. MyFitnessPal offers more methods to measure activity and health by integrating with a variety of wearable technology and fitness applications. Additionally, the app has a blog and community section where users may discover advice, motivation, and support from others embarking on comparable fitness journeys.

2.1.1.2 MyFitnessPal Features

A variety of features are available on MyFitnessPal to assist users in controlling their diet and level of exercise. For added convenience, customers can scan barcodes to get food information and explore and track meals from a large worldwide food database. Users may quickly set personalized macronutrient and calorie targets and track their daily food intake with the app. It also assists users in tracking their workouts and modifying their caloric intake according to their degree of activity. Along with tracking daily water intake, MyFitnessPal gives comprehensive nutritional analysis for every food item and tools for tracking weight and body measurements. The app's usefulness is improved by its integration with well-known exercise equipment and health apps. In addition to generating and saving customized recipes and meals, users can engage in a community platform for inspiration and support. Users are encouraged to create and meet weight-management goals by the app's capacity to generate nutritional charts and progress reports. It provides reminders to track food and water intake to help users stay on target. MyFitnessPal is a complete platform for reaching fitness and health objectives, offering premium customers access to advanced functions including meal plans and tailored insights.

2.1.1.3 MyFitnessPal Strength

With its many strength, MyFitnessPal is a complete and powerful tool for fitness and nutrition management. The system's large and varied food database makes it simple for users to find and track a wide range of foods. Additionally, users may rapidly add food by scanning labels due to the app's easy-to-use barcode scanning feature. By establishing customized calorie and macronutrient targets, it assists individuals in matching their diet to their unique fitness and health objectives. Additionally, the software easily syncs data across platforms by integrating with a variety of fitness devices and apps. Users can evaluate the nutritional content of each meal and monitor their progress throughout the day with the help of thorough nutrition analysis. Furthermore, by allowing users to track their meals and workouts, MyFitnessPal provides a comprehensive snapshot of daily calorie balance. In order to assist users keep hydrated and reach their hydration objectives, the app also has a feature for tracking water

intake. Through user forums and conversations, its community aspect encourages encouragement and support. By developing original meals and recipes, users may customize their nutrition plan. Additionally, the system's compatibility with many platforms, such as websites and mobile devices, guarantees that it can be utilized at any time and from any location.

2.1.1.4 MyFitnessPal Weakness

There are a number of issues with MyFitnessPal that may restrict how useful it is for some users. The system's limited database for local and regional cuisines is one of the main problems, which could make it difficult for users from other cultures to appropriately record their meals. The system also depends largely on user input, which can be laborious and error-prone because users must manually enter food names. Additionally, MyFitnessPal restricts access for users who are unwilling to subscribe to the premium edition by putting advanced features like meal planners, comprehensive analytics, and an ad-free experience behind a paywall. Another drawback is less fitness gadgets are supported by the system, which prevents certain users from fully integrating it for activity tracking. Additionally, the app's free edition has ads, which can deter users from using the system to its maximum potential. In addition, MyFitnessPal absence of offer a great deal of flexibility for users with certain dietary restrictions, such those who are gluten-free or have medical issues. Last but not least, the system fails to offer real-time suggestions based on users' dietary preferences or recorded meals, which could assist users in making better decisions throughout the day.

2.1.2 Health.family.my



Figure 2.1.2.1 Health.family.my

Health.family.my acts as a useful nutritional guide for people who want to keep an eye on their caloric intake in accordance with regional eating customs. This database offers a thorough inventory of both traditional and modern Malaysian foods, arranged according to meal categories like breakfast and teatime. Offering a culturally appropriate meter that facilitates user comprehension, each item offers full details on serving size, estimated calorie information, and the corresponding measurement in bowls of rice. This system's main goal is to increase public awareness of the calorie content of typical Malaysian foods. The platform only serves as a static informational tool, while having a comprehensive collection of nutritional statistics. Interactive elements like goal-setting tools, meal logging, user profile management, and customized dietary tracking are not included. As such, it may not be able to meet the needs of customers looking for a dynamic, customized dietary management solution, even as it promotes broad nutritional education.[6]

2.1.2.1 Health.family.my Function

A detailed platform that gives consumers precise calorie information for a variety of Malaysian foods is provided by Health.family.my. Users can explore dishes by meal type with ease according to the website's sortable food table. To make tracking their intake easier, users are given an estimated calorie count and average portion sizes for each food item. By displaying the calorie amount in terms of equal rice bowls, the platform also provides an easy-to-use comparison system that makes it easier for users to picture their meals. Along with providing

useful culinary knowledge in an easy-to-use manner, the website informs users on the nutritional advantages of different regional meals. Users learn about the nutritional content of their typical meals and apply this approach to make better dietary decisions.

2.1.2.2 Health.family.my Features

A user-friendly site that lists a variety of Malaysian food items and their calorie counts is provided by Health.family.my. It makes it simpler for users to locate pertinent nutritional information by classifying food based on meal kinds. Better information for meal planning is provided by the site, which allows users see how many calories are in a typical serving size and offers a special visual representation using rice bowl equivalents. The interface's simplicity and ease of use are intended to facilitate users' rapid analysis of nutritional data. The system places a strong emphasis on education and offers health-related advice to help users become more knowledgeable about nutrition. Furthermore, Health.family.my is made to be both web-accessible and mobile-friendly, guaranteeing that users easily get the information they require from any device at any time.

2.1.2.3 Health.family.my Strength

Health.family.my is a useful resource for anyone looking for nutritional advice because of a number of its strength. Users who are accustomed to local cuisine will find the system especially helpful as it offers dietary information specifically customized to Malaysian cuisine. Users can explore food items and retrieve calorie information with ease because to its simple and straightforward design. Visual aids like rice bowl equivalents are another way the system improves accessibility by giving consumers a better understanding of their caloric consumption. Additionally, it provides a useful guide for the calorie count of typical Malaysian meals, including teatime and morning fare. One of the system's noteworthy features is that it makes it simple and straightforward for users to read calorie information without requiring them to sign up or register in.

2.1.2.4 Health.family.my Weakness

Some restrictions on Health.family.my may make it less useful for users looking for a more individualized experience. The platform's inability to allow users to register meals, customize their data, or measure their daily consumption is one of its primary shortcomings, which reduces its applicability for continuous nutritional tracking. Furthermore, users' access to a more complete variety of nutritional information is hindered by the system's limited coverage of various food categories and primary focus on breakfast and teatime items. Users find it challenging to measure their progress because the platform restricted them to track their

total nutrition or calorie intake over time. Additionally, users are unable to set dietary goals or receive personalized advice, which limits the system's ability to be tailored to each user's unique health objectives. Lastly, the data's flexibility and relevancy fall short because it is fixed and does not adapt to the user's wants or preferences.

2.1.3 Channel New Asia's Calorie Calculator



Figure 2.1.3.1 Channel New Asia's Calorie Calculator

Channel News Asia Calorie Calculator helps users better grasp how many calories are in popular Southeast Asian dishes as an engaging and instructive interactive tool. People can sample a range of well-liked dishes like yong tau foo, nasi padang, mala xiang guo, dim sum, and economic rice via an easy-to-use interface. By letting users choose particular ingredients, cooking methods, and serving sizes, the program enables users to personalize their meals and calculate the approximate number of calories depending on their actual food selections. With the help of this function, customers may continue to enjoy their favourite regional cuisine while making better-informed nutritional decisions. It acts as a helpful manual for people who are keeping an eye on their weight, trying to eat healthier foods, or just want to be more conscious of what they consume. However, the website warns that the calorie estimations are just meant to serve as basic guidelines and should not be used in place of expert dietary advice.[7]

2.1.3.1 Channel New Asia's Calorie Calculator Function

By choosing regional cuisine and modifying serving sizes to suit their tastes, users of Channel News Asia's Calorie Calculator may customize their meal selections. After then, it determines the user's daily calorie intake accurately by considering the meals and quantities they have selected. By balancing the satisfaction of traditional cuisine with health-conscious

choices, this tool encourages consumers to embrace healthier eating habits while still savouring the culinary delights of their favourite regional dishes.

2.1.3.2 Channel New Asia's Calorie Calculator Features

By choosing from a large selection of components, users of Channel News Asia's Calorie Calculator can design their own regional dishes according to its dynamic and interactive interface. The system makes it simpler for users to customize their meal selections by highlighting well-known Southeast Asian dishes like dim sum and economical rice. Users will have an intuitive and accessible experience on any device due to the system's responsive design and seamless operation on web-based platforms and mobile devices.

2.1.3.3 Channel New Asia's Calorie Calculator Strength

The Calorie Calculator from Channel News Asia has a number of advantages that improve its usefulness and efficiency. Anyone can utilize and benefit from the system because of its user-friendly interface, which makes it accessible to people of every background and age. The system's real-time calorie computations help users keep track with their health objectives by empowering them to make timely and informed food decisions. The program is also culturally appropriate for Southeast Asian users because it provides a wide variety of regional cuisines, making it simple for them to include local foods in their meal planning and tracking.

2.1.3.4 Channel New Asia's Calorie Calculator Weakness

The Calorie Calculator from Channel News Asia contains a number of weaknesses that could reduce its overall usefulness. Important dietary components that are necessary for a thorough nutritional overview, such as protein, carbohydrates, and fats, are not included in the method. It is also less tailored to each user's needs because it does not offer advise that is tailored to their age, gender, and particular calorie objectives. Users who wish to track a greater range of meals have fewer customization possibilities because the system's food list excludes rare ingredients and some local cuisines. Additionally, users cannot record or record their meals over time due to the lack of a meal log option, which makes it challenging to keep track of calories and measure progress.

2.2 Recommendation to Improve the Similar Systems

Similar Systems	Recommendation to Improve the Similar Systems
MyFitnessPal	Increase the number of traditional Malaysian foods in the
	database.
	• Localize portion sizes (such as plates, bowls, and scoops)
	to correspond with Malaysian eating customs.

	Provide tools for comparing foods so that users can assess
	several items side by side.
	Include a chatbot driven by AI to provide real-time meal
	and nutrition recommendations.
	Reduce complication for Malaysian users by simplifying
	the user interface.
Health.family.my	Create a mechanism for tracking calories and recording
	meals rather than merely offering static calorie tables.
	Provide tools for users to create goals and monitor their
	progress toward their health objectives.
	Improve navigation and design for a more contemporary,
	approachable user experience.
	Provide a tool for comparing foods so that users can choose
	healthier options.
	Incorporate a chatbot powered by AI to provide personal
	recommendations and interactive assistance.
Channel New Asia's Calorie	Expand the food database to include more Malaysian
Calculator	meals.
	Allow users to record their meals and monitor their daily
	caloric consumption over time.
	• Allow compare several dishes in one view.
	Include tools for measuring health and creating customized
	goals.
	• Introduce an AI chatbot to provide consumers with
	nutrition and nutritional recommendations.
	Improve the interactive interface to facilitate continuous
	meal planning.

Table 2.2.1 Recommendation to Improve the Similar Systems

2.3 Comparison Between Similar Systems

MyFitnessPal	Health.family.my	Channel	New	Proposed Project
		Asia's	Calorie	
		Calculator		
• •				
X				
	_			•
	MyFitnessPal	MyFitnessPal Health.family.my	Asia's	Asia's Calorie

Meal Logging	X	X	/
Goal Setting & Progress Monitoring	' X	X	\
User Interface Design	X		~
Nutrient Breakdown	' X	X	~
Recipe Database	'	X	~
Community Forum	X	X	~

Table 2.3.1 Comparison Between Similar Systems

Chapter 3: System Methodology/Approach



Figure 3 Phase of Agile Lifecycle [12]

Agile Development is a highly flexible and iterative approach to software development, this technique focuses on producing functioning software gradually so that it can be continuously improved and adjusted in response to user feedback. Projects requiring adaptability and quick reactions to changes, like the development of the Malaysian Food Calories Tracker, are best suited for this methodology. Agile places a strong emphasis on regular stakeholder feedback, short development cycles (sprints), and ongoing improvement. Agile enables teams to swiftly adjust to customer feedback and requirements changes by segmenting the project into manageable chunks, guaranteeing that the project changes in response to user input and real-world usage [8].

The Malaysian Food Calories Tracker will be developed in a dynamic and responsive manner by utilizing the Agile approach. Agile's iterative process guarantees that the project stays in line with customer requirements and offers flexibility to accommodate modifications. A high-quality, user-friendly solution that satisfies Malaysian consumers' dietary requirements can be produced by the development team by segmenting the project into manageable sprints, implementing continuous integration, and giving stakeholders' feedback top priority. The Agile methodology's emphasis on cooperation, adaptability, and ongoing development will help a project succeed [9].

In the first phase which known as **ideation**, the project's objectives, needs, and features, such as meal logging, calorie tracking, and user goals are all established during this phase. Then, starts working on providing functional, incremental project components during the **development** phase. These elements are created in brief sprints or cycles, usually lasting one to two weeks. Coding, designing, and improving features like the food database and user interface are all part of each sprint [11]. When each sprint's development is finished, the **testing**

phase starts, where the new features are tested for bugs, functionality, and performance. After testing is successful, the features are deployed to the real-world environment and made available to users. Following by the **deployment** phase, the system moves into the **operations** phase, where it is monitored for execution and user feedback is collected. On the basis of this feedback and usage data, the system is continuously updated and iterated to ensure that it remains functional and user-centric.

3.1 System Design Diagram/Equation

These formulas serve as the foundation for the calorie-tracking function in this project. They make it possible for the app to give each user a customized calorie target, which is an essential feature of a nutrition-tracking software. The quantity of calories that a user's body burns while at rest is calculated using their Basal Metabolic Rate (BMR). A user enters their height, weight, age, and gender when they initially launch your application. Their calorie requirements are then determined by your system using this data to determine their unique BMR. After that, the user's BMR is multiplied by an activity factor to determine their Total Daily Energy Expenditure (TDEE). The user's self-reported amount of activity within your application determines this element. When a user chooses "Lightly active," for instance, the system computes their TDEE using the matching factor of 1.3.

Here is the Basal Metabolic Rate (BMR) formula:

Men = 10 x weight (kg) + 6.25 x height (cm) - 5 x age (years) + 5

Women = 10 x weight (kg) + 6.25 x height (cm) - 5 x age (years) - 161

Here is the Activity Factor according to level of activity:

Not very active = 1.2

Lightly active = 1.3

Moderate active = 1.5

Very active = 1.7

Here is the Total Daily Energy Expenditure (TDEE) formula:

BMR x Activity Factor

3.1.1 System Architecture Diagram

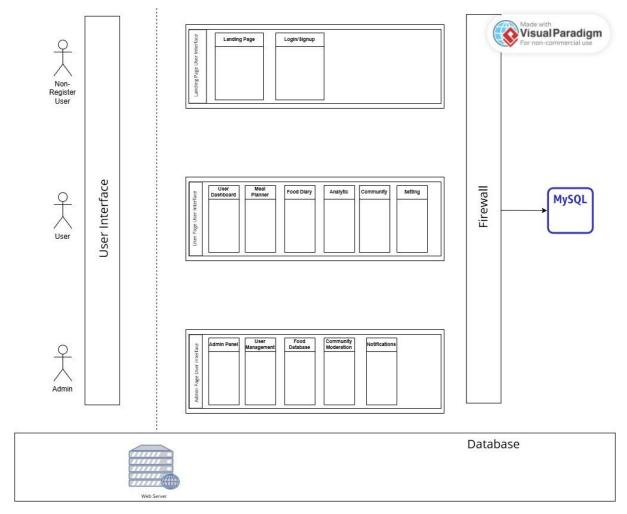


Figure 3.1.1 System Architecture Diagram of Malaysian Food Calorie Tracker

The system architecture diagram shows a three-tier architecture, which divides essential functions into discrete tiers and is a popular web application design style. This method improves security, maintainability, and scalability. There are three primary layers in the architecture: The client-side layer that the user directly interacts with is called the Presentation Tier. It consists of user interface (UI) elements including the Dashboard, Food Diary, and Login page, which are constructed with web technologies like HTML, CSS, and JavaScript. Information display and user-initiated request transmission to the server are handled by this layer. Application Tier: Constructed using PHP, this layer serves as the backend and has all of the business logic for the application. It manages tasks including user identification, caloric calculations, data management, and database communication in addition to processing requests from the user interface. The database layer, or data tier, is driven by MySQL. All of the application's data, including accounts, meal entries, community posts, and notifications, must be stored, retrieved, and managed by it.

3.1.2 Use Case Diagram and Description

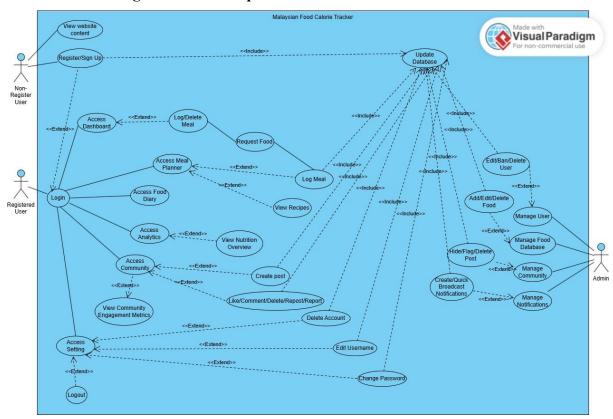


Figure 3.1.2 Use Case Diagram of Malaysian Food Calorie Tracker

According to Figure 3.1.2, the roles of administrators, registered users, and non-registered users are highlighted in this use case diagram, which depicts the functional interactions inside the Malaysian Food Calorie Tracker system. While registered users have access to a variety of services, such as the ability to log and delete meals, access the food diary, dashboard, analytics, community, and meal planner, as well as read nutrition overviews and recipes, non-registered users are limited to viewing website material and signing up. In addition, they have the ability to request new food items, modify account settings, like, comment, and report posts. By maintaining and updating the food database, issuing notifications, filtering community messages, and editing, banning, or removing members, admins, on the other hand, monitor the system. All things considered, the figure shows how each kind of user engages with the system's capabilities and how administrators may maintain functionality.

1. Register

Use Case	Regis	ter		
Purpose To		o allow user to create an account		
Actor	User			
Trigger	User	selects "Sign Up" from navigation header.		
Precondition	User	do not have an account		
Scenario Name	Step	Action		
Main Flow	1	Users click on the Sign Up button in the navigation header		
	2	Users fill in required information		
	3	Users click on "Sign Up" button		
	4	System will validate the received input		
	5	System checks whether the email entered has existed in the database		
	6	System stores user input into database		
	7	System redirects users to Dashboard page with a success message		
Alternate Flow – When	1	System will redirect to log in page		
users click on "Already	2	Users enter their account email address and password		
Have an Account" button	3	Users click on "Login" button with correct input		
	4	System will receive and validate user input		
	5	System will redirect users to main page		
Exception Flow	1	Name and email address have existed in database		
	2	Incorrect user input		
	3	Invalid name and email address		
Post Conditions	1	Users can login into their account		

Table 3.1.3 Register Use Case Description

2. Log In

Use Case	Login	Login		
Purpose	To all	ow users to log into their account		
Actor	User			
Trigger	User s	elects "Login" button from navigation header.		
Precondition	User h	ad registered an account		
Scenario Name	Step Action			
Main Flow	1	Users click on the "Login" or "Register" link in the navigation header		
	2	Users enter their registered username and email address		

	3	Users click on "Login" button with correct username and email
		address
	4	System will receive user input and validate their name and password
	5	System will redirect users to Dashboard page
Alternate Flow – When	1	System will display a reset password form asking users to enter their
users click on "Forgot		email address
Your Password" button:	2	Users fill in their email address
	3	Users reset their password
	4	System will update the new password in database
Alternate Flow – When	1	System will display a registration form
users click on "Don't	2	Users fill in required information
have an account" button	3	Users click on "Register" button
	4	System will receive the user input and validate the input
	5	System checks whether the requested email has been existed in the
		database
	6	System stores user input into database
	7	System will redirect users to Dashboard page
Exception Flow	1	Incorrect user input
	2	Invalid username and email address
	3	Username and email address have existed in database
	1	Users able login into their account successfully
Post Conditions	2	System updates new password into database when users perform
		reset password action
	3	System stores user input into database

Table 3.1.4 Login Use Case Description

3. Admin Log In

Use Case	Admii	Admin Login	
Purpose	To all	To allow admin to log into their account	
Actor	Admii	Admin	
Trigger	Admiı	Admin selects "Login" button from navigation header.	
Precondition	Admiı	Admin account has been added	
Scenario Name	Step	Action	
Main Flow	1	Admin click on the "Login" button in the navigation header	
	2	Enter their username and password	

	3	Click on "Login" button with correct username and password
		System will validate the input and redirect them to respective pages according to their role
Alternate Flow	-	
Exception Flow	1	Incorrect username or password
	2	Invalid username
	1	Users able login into their account successfully
Post Conditions		System updates new password into database when users perform reset password action

Table 3.1.5 Admin Login Use Case Description

4. Logout

Use Case	Logoi	Logout		
Purpose	To all	To allow users to perform logout and erase the sessions		
Actor	User a	User and Admin		
Trigger	User s	User selects "Logout" button		
Precondition	User l	User had logged in into their account		
Scenario Name	Step	Action		
Main Flow	1	Users click on the "Logout" button in navigation header		
	2	System will delete his/her session		
	3	System will redirect users to Login page		
Alternate Flow	-			
Exception Flow	-			
Post Conditions	1	System erases user sessions and redirects to Login page		

Table 3.1.6 Logout Use Case Description

5. Log Meal

Use Case	Log M	Log Meal	
Purpose	To all	To allow users to log meal	
Actor	User	User	
Trigger	User s	User selects "Add Meal" button from navigation header.	
Precondition	User h	User had logged in into their account	
Scenario Name	Step	Action	
Main Flow	1	Users click on the "Add Meal" button in the navigation header	
	2	Users select a mealtimes and meal	
	3	Users enter the quantity consumed	

	4	System validates all require input field
	7	
	5	System updates the meal entry in the database
	6	System calculates total nutritional value based on user selected quantity
	7	System updates user daily nutrition total
	8	System updates daily calorie progress bar and nutrient chart
	9	System updates Food Diary page with the new meal entry
	1	User clicks on "Custom Meal" button
Alternate Flow – User	2	User fill in the meal name and nutrition information in the custom food
want to log a custom meal		form
	3	User saved the custom meal
	4	System will update the custom meal in database
Alternate Flow – No meal	1	System display message "No food found matching your search"
found in search	2	Users can request food to be added into database
	3	User filled in food request form with required info
	4	System stores user input into database
Exception Flow	1	System display "Error adding meal" message
	2	Invalid quantity input
	1	Meals are successfully logged in the Food Diary page
Post Conditions	2	Nutrition data is calculated and updated
	3	User's daily calories and nutrient info are updated
	4	Meals display in the Food Diary page

Table 3.1.7 Log Meal Use Case Description

6. Delete Meal

Use Case	Delete	Delete Meal	
Purpose	To all	To allow users to delete a existed meal	
Actor	User	User	
Trigger	User s	User selects "Delete Meal" button from navigation header.	
Precondition	User r	User must have at least one logged meal	
Scenario Name	Step	Action	
Main Flow	1	User navigates to the Food Diary or Meal Planner page from the menu	
	2	System displays the current day's meal log with existing entries	
	3	User identifies the specific meal want to remove	
	4	User clicks the trash icon next to the meal logged	

	5	System displays message "Are you sure you want to delete this meal entry?"
	6	User confirms deletion
	7	System removes meal from database
	8	System updates the user's meal count and recalculates nutrition total
	9	System displays success message: "Meal deleted successfully!"
Alternate Flow	-	
Exception Flow		System displays error message: "Unable to delete meal. Please try again."
Post Conditions	1	Meal entry is permanently removed from the user's food diary
	2	User's daily calories and nutrient totals are recalculated and refreshed

Table 3.1.8 Delete Meal Use Case Description

7. Create Post

Use Case	Create Post	
Purpose	To allow users to create post in Community Page	
Actor	User	
Trigger	User selects "Post" button from navigation header	
Precondition	User must be logged into the system	
Scenario Name	Step	Action
Main Flow	1	User navigates to the Community page from the menu
	2	User clicks "Create Post" button
	3	User writes text or upload image
	4	System displays post preview with all content and media
	5	User clicks "Publish" or "Share" button
	6	System saves post to database
	7	System publishes posts to community feed
Alternate Flow	-	
	1	System encounters errors during image upload
	2	System displays error: "Unable to publish post. Please try again."
Exception Flow	3	System detects user account is suspended
	4	System detects post exceeds 500 character limit
	5	System detects image exceeds 5MB limit
Post Conditions	1	Post is successfully created and published on the community page
i ost Collations	2	Post appears in the community feed for all users to view

3	Post is stored in the database table
4	User's post count and activity statistics are updated
5	Other users can view, like, and comment on the new post

Table 3.1.9 Create Post Use Case Description

8. View Recipe

Use Case	View Recipe		
Purpose	To allow users to view recipes		
Actor	User		
Trigger	User s	selects "Recipes" tab from Meal Planner	
Precondition	Recip	e must exist in the database and be inserted	
Scenario Name	Step	Action	
Main Flow	1	User navigates to the Recipes tab from Meal Planner	
	2	System displays recipe listing with search and filter options	
	3	System queries recipe database and displays matching results	
	4	User can filter recipes by categories	
	5	User clicks on a recipe from the search results or recipe grid	
	6	System retrieves recipe data from database: title, description,	
		ingredients, instructions	
Alternate Flow- User	1	System filters recipes by selected category	
wants to view recipe by category	2	System loads recipe details and prepares display	
	3	System displays cooking time, difficulty level, serving size, and	
category		ingredients	
Exception Flow	1	Recipe not found	
Exception Flow	2	Recipe content corrupted	
Post Conditions	1	Recipe details are displayed to the user	

Table 3.1.10 View Recipe Use Case Description

9. Manage Food Database (Admin)

Use Case	Manage Food Database		
Purpose	To allow admin to add or delete meals from database		
Actor	Admin		
Trigger	User selects "Food Database "from navigation header		
Precondition	Admin must be logged into the system		
Scenario Name	Step	Action	
Main Flow	1	Admin clicks on "Food Database" from menu	

	2	System displays food database statistics (total foods, recent additions, pending requests)
	3	Admin can choose to: Add New Food, Delete Food, or Review Food Request
	4	System presents appropriate interface based on selected action
	5	System updates food database with new or modified information
Alternate Flow- Admin	1	Admin clicks "Add New Food" button
want to add a new food	2	System presents food creation form with required fields
item	3	Admin enters food name, category, and nutritional information
	4	System updates the food database record
	1	Admin clicks "Delete" button next to food item
Alternate Flow- Admin	2	System displays confirmation dialog: "Are you sure you want to delete
want to delete existed		this food item?"
food item	3	Admin confirms deletion
	4	System updates the food database record
Alternate Flow- Admin	1	System displays pending food requests from users
want to manage food	2	Admin reviews request details and nutritional information
request	3	Admin can approve or reject food request
Exception Flow	1	System cannot connect to food database
Exception Flow	2	System detects food item already exists with similar name
Post Conditions	1	Food database is updated with new, modified, or deleted food items
r ost Conditions	2	Users can access updated food information

Table 3.1.11 Manage Food Database (Admin) Use Case Description

10. Manage User (Admin)

Use Case	Manag	Manage User		
Purpose	To allo	To allow admin to add/delete/ban user from database		
Actor	Admir	Admin		
Trigger	User s	User selects "User Management" from navigation header		
Precondition	Admir	Admin must be logged into the system		
Scenario Name	Step	Action		
Main Flow	1	Admin navigates to "User Management" from menu		
	2	System displays user statistics (total users and active users)		

	3	Admin can choose to: View User Details, Edit User Profile,
		Suspend/Activate User or Delete User
	4	System presents appropriate interface based on selected action
	5	System updates user database with new or modified information
Alternate Flow- Admin	1	Admin clicks "Edit" button next to user
want to edit user	2	System loads user data into editable form
want to east aser	3	Admin modifies user information (username, email, status)
	4	System updates the user database record
	1	Admin clicks "Ban" or "Unban" button next to user
Alternate Flow- Admin	2	System displays confirmation dialog "Are you sure you want to ban this user?"
want to ban or unban user	3	Admin confirms deletion
	4	System updates the user database record
	1	Admin clicks "Delete Account" button next to user
Alternate Flow- Admin want to delete user	2	System displays warning: "This action will permanently delete the user account"
	3	System shows data that will be deleted (meals, posts, preferences)
	4	Admin confirms permanent deletion
Exception Flow	1	System cannot connect to user database
Post Conditions	1	User activity is monitored and logged
i osi Conditions	2	User accounts are created and modified as needed

Table 3.1.12 Manage User (Admin) Use Case Description

11. Manage Community (Admin)

Use Case	Manaş	Manage Community		
Purpose	To all	To allow admin to manage posts in the community feed		
Actor	Admii	Admin		
Trigger	User s	User selects "Community Moderation" from navigation header		
Precondition	Admii	Admin must be logged into the system		
Scenario Name	Step	Action		
Main Flow	1	Admin navigates to "Community Moderation" from menu		
	2	System displays moderation interface with content queue and filter		
		options		

	3	System displays moderation statistics (pending reports, flagged content, resolved cases)
	4	System shows recent community activity and content
	5	System displays user reports and content flags
	6	System displays content details including post, comments, and user information
	7	System shows report reasons and user complaints
	8	Admin checks for spam, harassment, inappropriate language, or policy violations
	9	Admin can choose to: Remove/Hide/Flag content and Suspend User
	10	System presents appropriate action interface based on selected decision
	11	System updates community database with new or modified information
Alternate Flow- Admin	1	Admin clicks "Delete"/ "Flag"/" Hide" button
want to delete/flag/hide	2	Admin selects action and enters reason
post	3	Admin confirms content removal
	4	System updates the community database record
Exception Flow	1	System cannot connect to content database
Post Conditions	1	Inappropriate content is removed or flagged
r ost Conditions	2	Users are notified of moderation actions

Table 3.1.13 Manage Community (Admin) Use Case Description

12. Notification Management (Admin)

Use Case	Notification Management	
Purpose	To allow admin to manage notification to the user	
Actor	Admin	
Trigger	User selects "Notification" from navigation header	
Precondition	Admin must be logged into the system	
Scenario Name	Step	Action
Main Flow	1	Admin navigates to "Notification" from menu
	2	System displays notification management interface with creation and management tools
	3	Admin can choose to: Create New Notification, View Sent Notifications or Quick Broadcast
	4	System presents appropriate interface based on selected action
	5	Admin clicks "Create Notification" button

	6	System presents notification creation form with required fields
	7	Admin selects target audience (all users and specific users)
	8	System updates database record
Alternate Flow- Admin	1	Admin clicks "Broadcast Notification" option
want to create broadcast	2	System presents broadcast notification interface
notification	3	Admin enters broadcast message and selects all users
	4	Admin sets broadcast priority and delivery method
Alternate Flow- Admin	1	Admin clicks "Targeted Notification" option
want to create targeted	2	System presents user selection interface
notification	3	Admin selects specific users or user groups
	4	Admin customizes message for target audience
Alternate Flow- Admin	1	Admin clicks "Quick Broadcast" option
wants to send quick	2	System presents simplified broadcast interface
broadcast	3	Admin selects predefined message templates
oroadcast	4	Admin chooses target audience and sends immediately
	1	System cannot connect to notification database
Exception Flow	2	System cannot find specified target users
	3	System encounters errors during notification delivery
Post Conditions	1	Notifications are created, sent, and managed appropriately
i osi Coliditiolis	2	Users receive targeted or broadcast notifications

Table 3.1.14 Notification Management (Admin) Use Case Description

3.1.3 Activity Diagram

1. Register

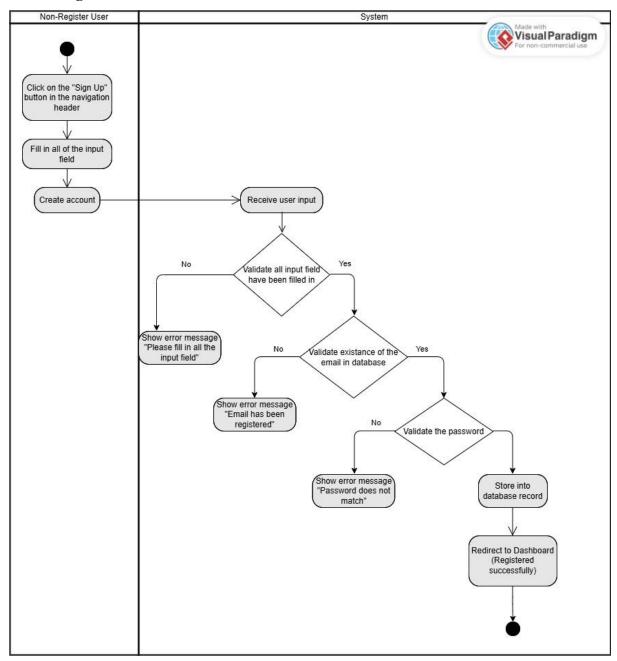


Figure 3.1.3.1 Register Activity Diagram

As shown as the above figure 3.1.3.1, a user who has not yet registered creates an account by clicking the "Sign Up" button and completing the necessary fields, as shown in this activity diagram. After that, the system goes through a number of validations, first confirming that all fields have been filled out, then confirming that the email address is already in the database, and lastly confirming that the password criteria are met. The relevant error messages ("Please fill in all the input field," "Email has been registered," or "Password does not match") are shown

if any validation fails. The system completes the registration workflow by storing the user's information in the database and redirecting them to a dashboard that displays the "Registered successfully" confirmation after all validations have been successfully completed.

2. User Log In

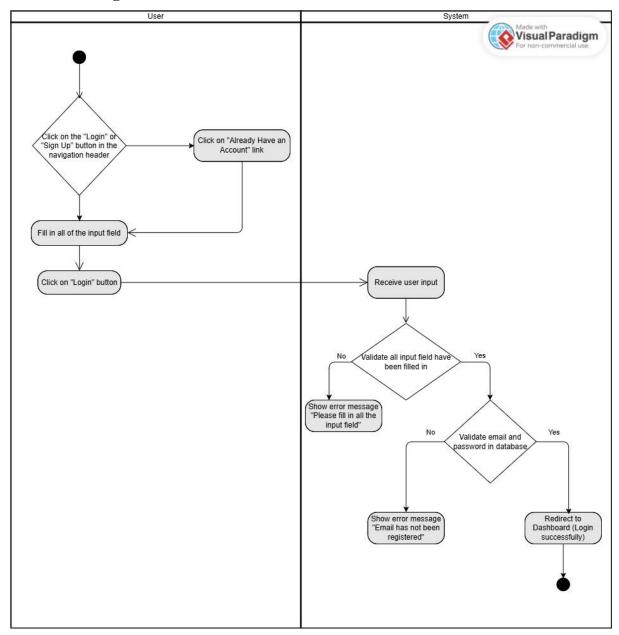


Figure 3.1.3.2 User Log In Activity Diagram

The user can choose to click on the "Login" or "Sign Up" buttons in the navigation header at the beginning of the user login process, which is shown in Figure 3.1.3.2. Both options lead to the user entering information and pressing the "Login" button. The user input is then verified by the system in two steps: first, it verifies that all needed fields have been filled in (if not, it displays the error "Please fill in all the input field"); if not, it compares the password and email

address to the database entries. The system displays a "Email has not been registered" error notice if the credentials don't match, but if validation is successful, the user is taken to the dashboard with a "Login successfully" confirmation, finishing the authentication process.

3. Admin Log In

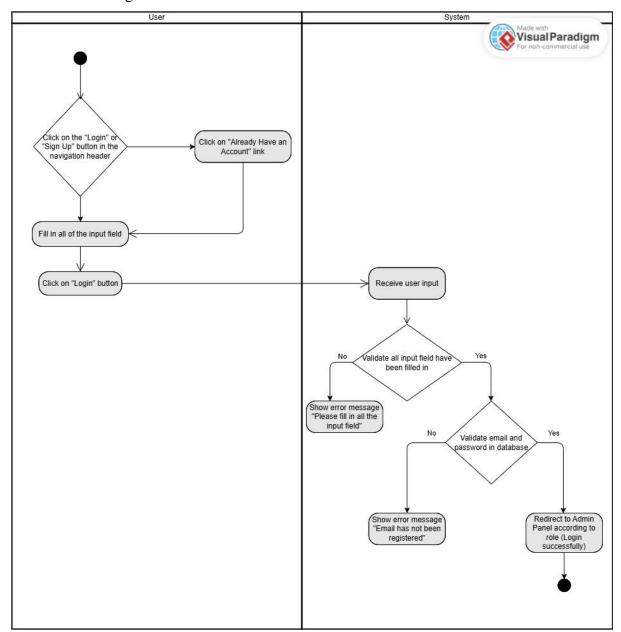


Figure 3.1.3.3 Admin Log In Activity Diagram

The "Login" or "Sign Up" buttons in the navigation header allow admin to access the system, and both lead to form completion and login submission. Figure 3.1.3.3 shows a role-based login procedure. In order to execute sequential validation, the system first verifies that all input fields are filled in (displaying the error "Please fill in all the input field" if any are not), and then it compares the email address and password credentials to the database. The

system reroutes users to an Admin Panel depending on their given role after successful validation, confirming "Login successfully" and concluding the role-based authentication workflow. If authentication fails, a "Email has not been registered" error is displayed.

4. Logout

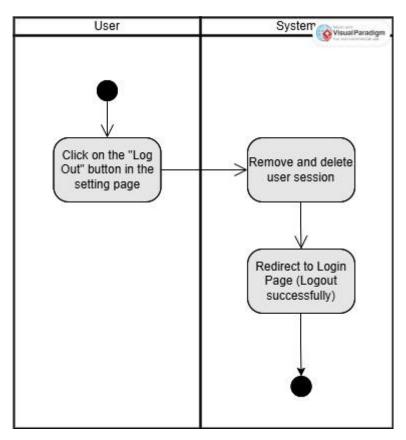


Figure 3.1.3.4 Logout Activity Diagram

Based on figure 3.1.3.4, the user hits the "Log Out" button on the settings page, which causes the system to instantly erase and destroy the user's session data. This activity diagram illustrates a basic user logout procedure. The system completes the secure logout process and makes sure the user's session is appropriately ended by rerouting the user back to the Login Page with a "Logout successfully" notification message after the session has been successfully cleared.

5. Reset Password

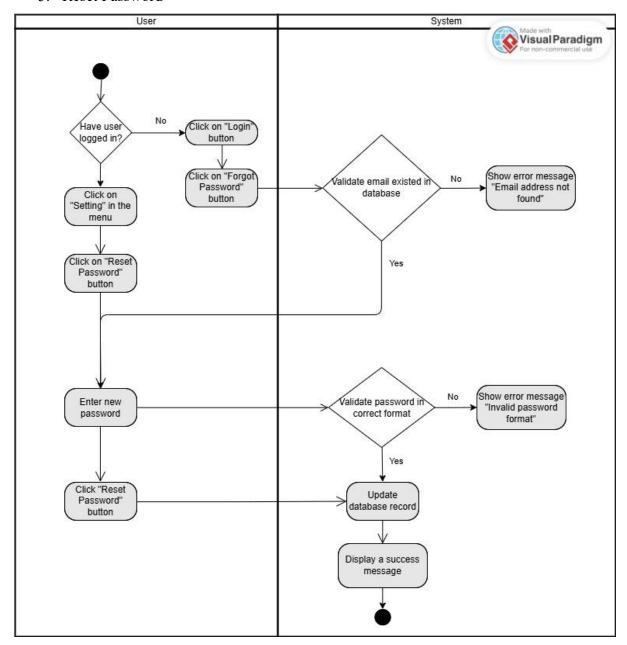


Figure 3.1.3.5 Reset Password Activity Diagram

Figure 3.1.3.5 shows how to reset a password. If the user is not logged in, they must click the "Login" and "Forgot Password" buttons. If they are logged in, they can access the function by selecting the "Setting" menu and clicking the "Reset Password" button. When a user inputs a new password, the system first verifies that the email address is in the database (displaying "Email address not found" if it isn't) and then verifies the password format (displaying "Invalid password format" if it isn't). The system completes the secure password reset process with appropriate identification and validation checks when the email and password formats are successfully validated. It then updates the database record and shows a success message.

6. View and Update Profile

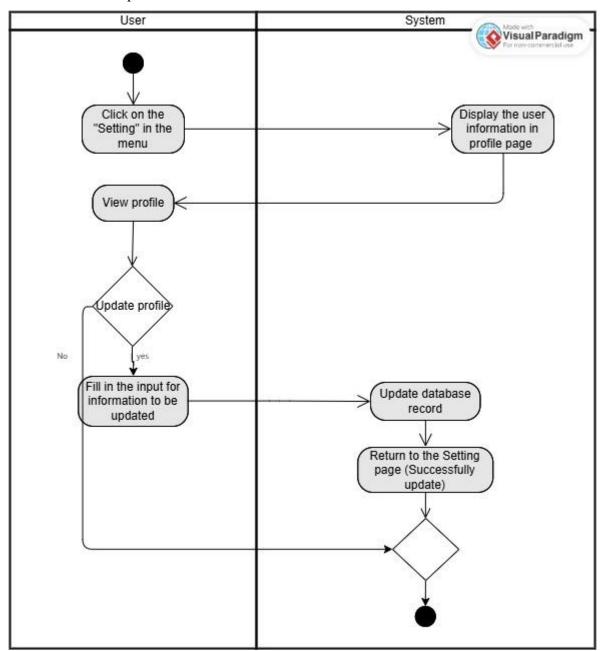


Figure 3.1.3.6 View and Update Profile Activity Diagram

The user profile management process is shown in Figure 3.1.3.6. It starts when the user selects "Setting" from the menu, which causes the system to provide the user data on the profile page for viewing. After that, the user has the option to update their profile; if they pick "No," the process is over; if users choose "Yes," users continue by entering the information that needs to be updated in the input fields. The profile alteration workflow is finished when the user submits the changes, at which point the system updates the database record and brings the user back to the Settings page with a "Successfully update" confirmation message.

7. Log, Delete, and Request Meal

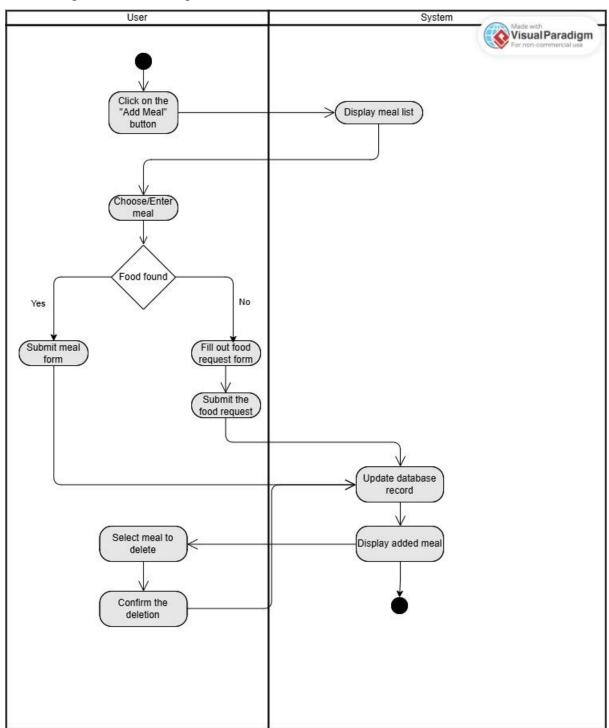


Figure 3.1.3.7 Log, Delete, and Request Meal Activity Diagram

By first selecting the "Add Meal" button, which presents the meal list for choosing, users can add, request, and delete meals in this activity diagram that depicts a meal management system. The system determines whether the selected meal is available; if it is, users can submit the meal form right away; if not, they must complete a food request form and submit it for review. A thorough workflow for meal tracking, requesting new items, and maintaining the Bachelor of Information Technology (Honours) Communications and Networking Faculty of Information and Communication Technology (Kampar Campus), UTAR

meal database is provided by both routes, which result in updating the database record and displaying the updated meal. Users may then choose which meals to delete and confirm the deletion.

8. View Nutrition and Calorie Tracking

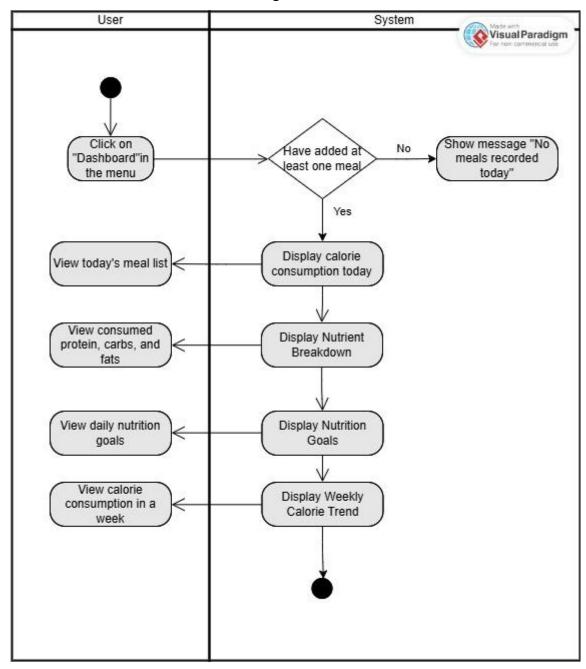


Figure 3.1.3.8 View Nutrition and Calorie Tracking Activity Diagram

Figure 3.1.3.8 shows a dashboard system for tracking calories and nutrients that starts when the user selects "Dashboard" from the menu. This causes the system to determine whether at least one meal has been entered today. The system shows "No meals recorded today" if no meals are recorded, but if there are, it offers detailed nutritional data in a sequential manner,

including daily nutrition goals, weekly calorie trends, nutrient breakdown (protein, carbohydrates, and fats), and today's calorie consumption. Users can browse their meal list, track their intake of macro and micronutrients, track their progress toward their goals, and examine weekly consumption habits for efficient dietary management thanks to this comprehensive nutritional overview.

9. Weekly Plan and View Recipes

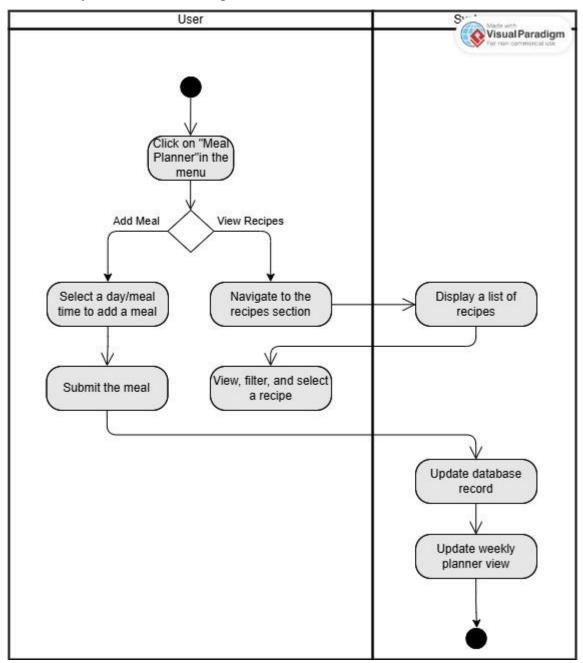


Figure 3.1.3.9 Weekly Plan and View Recipes Activity Diagram

The meal planning system depicted in figure 3.1.3.9 allows users to select between two options after clicking on "Meal Planner" in the menu: "Add Meal" and "View Recipes." Users

add meals by choosing a day and time, then submit the meal immediately to update the weekly planner view and database. Users examine recipes by navigating to the recipes section, where a list of available recipes is displayed by the system. They can view, filter, and pick recipes, which causes the database record to be updated and the weekly planner view to refresh. Both processes work together to keep the meal planning interface up to date and give users extensive meal planning and recipe browsing features.

10. View Food Diary

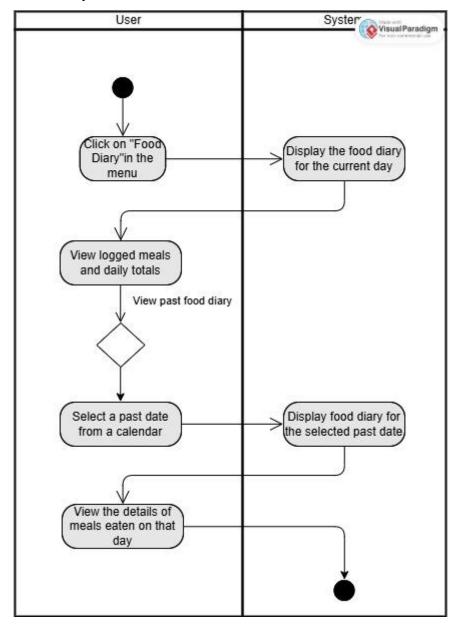


Figure 3.1.3.10 View Food Diary Activity Diagram

This activity diagram shows a food diary system in which users click on "Food Diary" from the menu to view the food diary for the current day, which includes daily nutritional totals and tracked meals. Then, by picking a date from a calendar, users can opt to read previous food diary entries. This causes the system to show the food diary for that particular historical day. A thorough food monitoring and review system that enables users to track their eating habits over time and examine their nutritional intake history is provided by the ability to view all the details about the meals consumed on any particular day after examining either recent or previous entries.



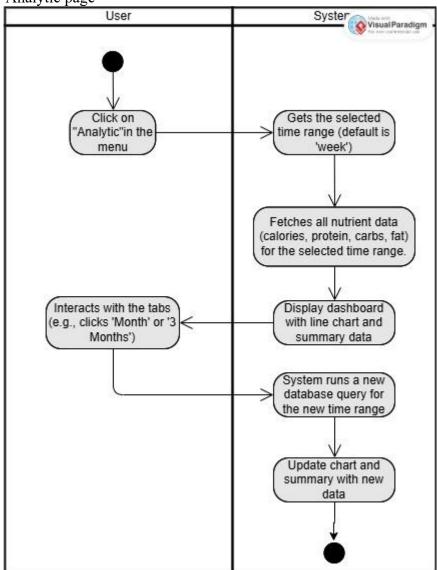


Figure 3.1.3.11 View Analytic Page Activity Diagram

In the nutrition analytics system shown in this figure 3.1.3.11, users can access data visualization capabilities with a default weekly view by selecting "Analytic" from the menu. After retrieving the chosen time frame, the system presents an interactive dashboard with line charts and summary statistics along with complete nutrient data (calories, protein, carbohydrates, and fat) for that time frame. By interacting with tabs (like "Month" or "3

Months"), users can change the time frame. This allows the system to run the latest database queries for the updated range and update the charts and summaries with the relevant data, allowing for flexible temporal analysis of patterns and trends in nutritional intake.

12. Community Interaction User VisualParadigm Click on Display the Community page with the menu all sections populated Fetches all nutrient data Create post (calories, protein, carbs, fat) View Leaderboards for the selected time range. View posts Like/Unlike/Comment/Repost/Report/Delete(If View top achievers and Clicks "Share" or own) contributors 'Create" button Upload a photo/type text Undate database record Updated to show the new post

Figure 3.1.3.12 Community Interaction Activity Diagram

Users can access a full social platform that displays every section and retrieves nutrient data for the chosen time period by clicking on "Community" in the menu. Figure 3.1.3.12 illustrates a social community platforms for nutrition tracking. Three primary pathways are offered by the system: viewing leaderboards, which show the top contributors and achievers; creating new posts by clicking the "Share" or "Create" buttons to add text or images; and viewing posts, which let users like, unlike, comment, repost, report, or remove their own content. In order to provide an integrated social platform that blends nutrition tracking with community involvement and gamification components, every user interaction updates the database and refreshes the community display to showcase new posts.

13. Admin Panel

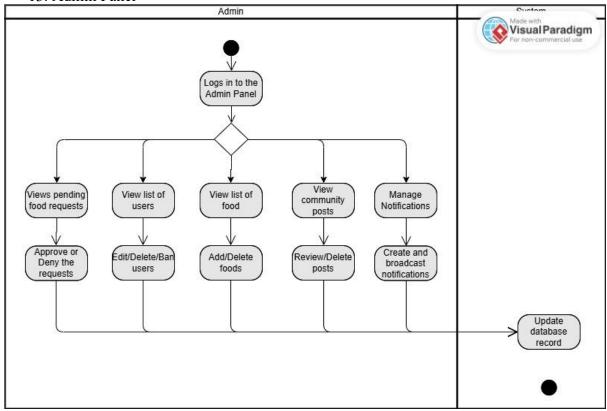


Figure 3.1.3.13 Admin Panel Activity Diagram

Figure 3.1.3.13 shows an admin panel management system in which a central decision point allows an administrator to access five primary administrative functions after logging into the Admin Panel. In addition to managing users through edit, delete, and ban operations, the administrator can view and approve or deny pending food requests, moderate community content by reviewing and removing posts, manage system communications by creating and broadcasting notifications to users, and maintain the food database by adding or removing food items. In order to provide complete platform administration capabilities for monitoring user requests, managing content, user management, and overall communications, all administrative activities come together to update the database record.

3.2 Timeline

3.2.1 Timeline-FYP1

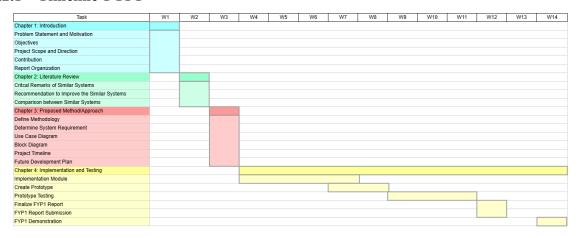


Figure 3.2.1.1 Timeline-FYP1

3.2.2 Timeline-FYP2

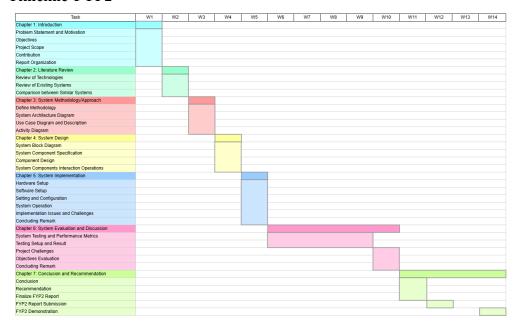


Figure 3.2.1.2 Timeline-FYP2

Chapter 4: System Implementation

4.1 System Block Diagram

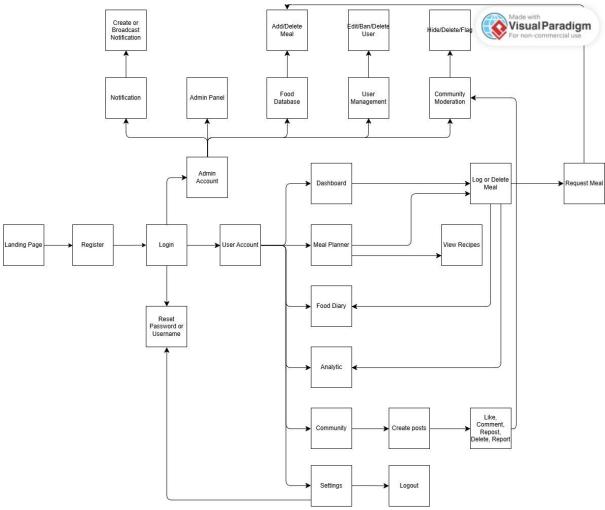


Figure 4.1.1 System Block Diagram of Malaysian Food Calorie Tracker

The Malaysian Food Calorie Tracker's overall design is illustrated in the system block diagram, which highlights both admin and user-side features. The user interface, meal management, recipe and food database, analytics, community engagement, notification services, and administrative control are among the various elements that make up the system. To provide safe access and account management, the user interface starts with modules like landing page, registration, login, logout, and password reset. Users may access their dashboard and important features like the meal planner, food diary, analytics, community, and settings after authenticating. While analytics provide information on calorie intake and nutrition, the meal planner and food journal modules let users request new meals, log or remove meals, and see recipes. By allowing users to submit, like, comment, repost, and report content, the community module facilitates interaction. Users receive notifications to stay informed about system events and the status of their health tracking. On the administrative side, the admin

panel and account enable community moderating activities like hiding or flagging posts, creating or broadcasting notifications, managing users with edit, ban, or delete options, and managing the food database. All things considered, the block diagram shows how the system combines administrative supervision, community involvement, and customized food tracking to provide a thorough and culturally appropriate health management platform.

4.2 System Components Specifications

- 1. User Authentication Components:
 - Register: Enables new users to register by entering the required information, including their age, gender, height, weight, username, email address, password, and activity level. Connects to the MySQL database and PHP session management to store and validate user data. uses PHP's password_hash() function to implement password hashing for safe credential storage.
 - Login/Logout: Uses PHP sessions with appropriate timeout management to safely manage user sessions. Allows role-based access control (user/admin) and email/password authentication. Incorporates secure logout features that properly reroute users and delete session data.
 - Forgot Password: Carries out a safe password recovery procedure by using email verification as it creates safe reset tokens and emails password reset links. Incorporates token expiration and form validation for increased security.

2. Food Database and Management System:

- Food Database Module: Admins and users can add, search, and manage
 Malaysian food products with detailed nutritional data. To find calories,
 protein, carbs, fat, and other micronutrients, the module searches the foods
 database. Supports food names in both Malay and English for improved
 accessibility.
- Food Request System: Requests for missing food products to be added to the
 database can be made by users. Requested items with appropriate nutritional
 validation can be reviewed, approved, and added by admin as it uses a queue
 mechanism to effectively handle meal demands.

3. Meal Tracking and Nutrition Analysis:

 Meal Logging Module: Allow users record food items and quantities and choose mealtimes (breakfast, lunch, dinner, and snack). The module gives real-time nutrition reports, computes total nutritional intake, and queries the foods database. Quick-add functionality for commonly consumed foods is supported.

- Calorie Calculation Module: Calculates TDEE (Total Daily Energy
 Expenditure) and BMR (Basal Metabolic Rate) using the Mifflin-St Jeor
 equation, which have been scientifically proved. Provides tailored calorie
 recommendations based on user demographics, exercise levels, and weight
 objectives.
- Nutrition Dashboard: Display a thorough nutritional analysis that includes both macronutrients (fat, carbohydrates, and protein) and micronutrients. For daily, weekly, and monthly nutrition objectives, it offers progress monitoring and visual charts.

4. Analytics and Reporting System:

- Analytics Module: Creates insights on eating habits, trends in calorie intake, and nutritional balance by processing user data. Carries out statistical computations for measuring weight, tracking BMI, and evaluating health progress.
- Data Visualization: Creates visual charts and graphs for calorie consumption patterns, nutrition trends, and goal achievement progress by integrating the Chart.js module which allows for the export of data for outside analysis.
- Progress Tracking: Uses milestone celebrations and visual indicators to track a user's progress toward health goals. It offers trend analysis and historical data comparison for accountability and incentive.

5. Community Module:

- Community Platform: Allow users to provide the community with progress updates, healthy meal ideas, and accomplishments. Enables user interaction through the implementation of a social feeds system with like, comment, and repost features.
- Leaderboard System: Shows the best achievers in a number of areas, including community involvement, and consistency in calorie tracking. Uses aspects of gamification to promote constructive competition.

6. Admin Management System:

- User Management System: Admins have complete user activity tracking and can examine, update, and manage user accounts. Manages the state of user accounts (active, suspended, and deleted).
- Community Moderation System: Offers resources for policing user-generated content, and community posts. Inappropriate content management is flagged and reported using this approach.

7. Notification System:

- Real-Time Notification: Incorporates a modal display and bell icon alerting system for real-time user updates. Supports a variety of notification formats, such as health reminders, community interactions, and system announcements.
- Broadcast Messaging: Admins can deliver users broadcast or tailored messages as it combines read status tracking with priority-based messaging.

4.3 ERD Diagram

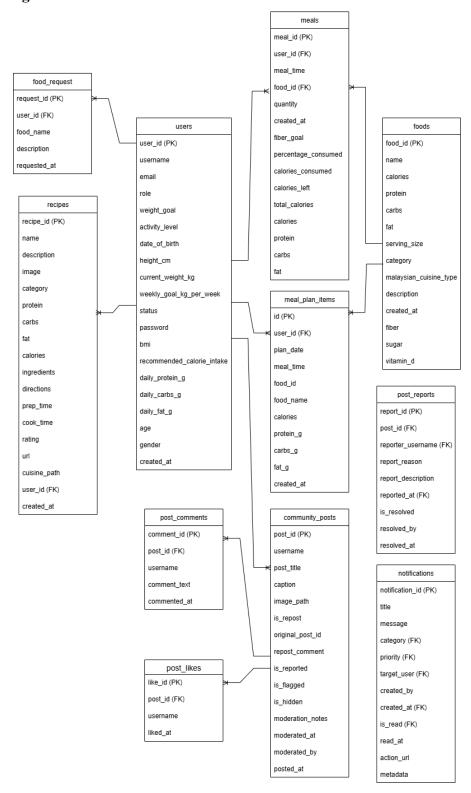


Figure 4.3.1 ERD Diagram of Malaysian Food Calorie Tracker

The ERD Diagram in Figure 4.3.1 shows the entities and their relationships that comprise the database's data organization. Users, Foods, Meals, Recipes, Food_Requests, Meal_Plan_Items, Community_Posts, Post_Comments, Post_Likes, Post_Reports, and Bachelor of Information Technology (Honours) Communications and Networking Faculty of Information and Communication Technology (Kampar Campus), UTAR

Notifications are some of the main components of the system. Because each user can log multiple meals, submit food requests, create recipes, post content, and receive notifications, the Users entity maintains one-to-many (1:M) relationships with Meals, Recipes, Food_Requests, Community_Posts, and Notifications. It also stores attributes like user_id as the primary key, along with personal and login details. The Meals entity establishes a many-to-many relationship between people and Foods by connecting people to the foods they eat through the usage of meal_id as the primary key and user_id and food_id as foreign keys. Meal_Plan_Items provides formal nutritional planning, while the Recipes entity lets users construct customized meal options. While Post_Comments, Post_Likes, and Post_Reports provide for moderation and participation through many-to-one relationships with postings, Community_Posts facilitates social interaction by allowing users to exchange material. Notifications guarantee individualized communication by providing system notifications linked to certain users. All things considered, this ERD exhibits a thorough framework that unifies community engagement, recipe management, food tracking, and health planning into a single platform.

4.4 System Operation

1. Website Landing Page

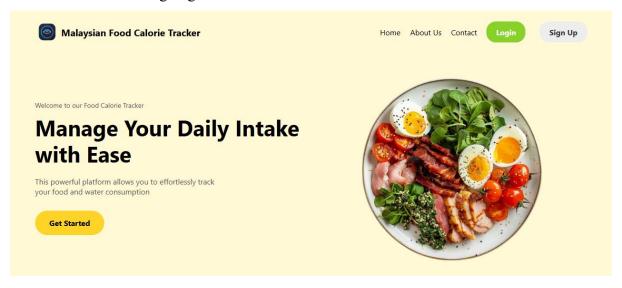


Figure 4.4.1.1 Website Landing Page

Achieve Your Goals

Take control of your nutrition and wellness journey with our intuitive tools and personalized recommendations



Figure 4.4.1.2 Website Landing Page (Continue)

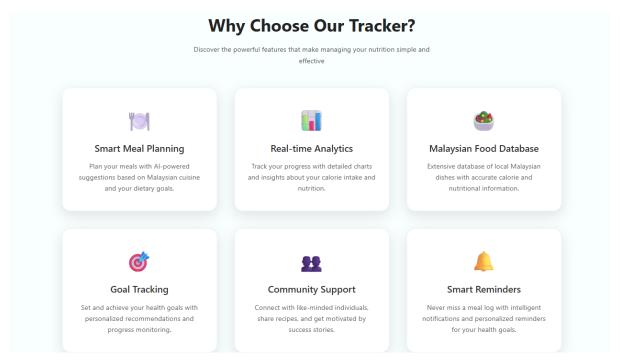


Figure 4.4.1.3 Website Landing Page (Continue)

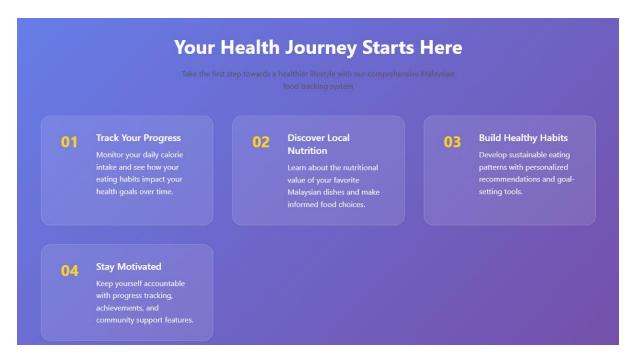


Figure 4.4.1.3 Website Landing Page (Continue)



Figure 4.4.1.4 Website Landing Page (Continue)

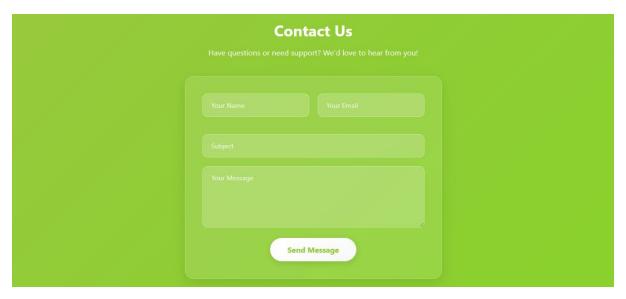


Figure 4.4.1.5 Website Landing Page (Continue)

The main landing page will appear on the screen when users enter a valid URL to access the website. The Malaysian Food Calorie Tracker logo and a navigation header with the words "Home," "About Us," "Contact," "Login," and "Sign Up" are situated at the top of the page. Users can access the designated sections or be sent to login/registration pages by clicking on the corresponding header links. All of the available parts are combined into a single scrollable page layout on the main page. From the Welcome/Hero section, which introduces the food calorie tracker, to the Achieve Your Goals section, which highlights meal planning features, to the Features section, which highlights six key functionalities (Smart Meal Planning, Real-time Analytics, Malaysian Food Database, Goal Tracking, Community Support, and Smart Reminders), the Health Benefits section, which outlines a four-step process with usage statistics, the Call-to-Action section, which encourages user registration, and the Contact Us section, which comes last. A thorough inquiry form with sections for name, email, subject, and message, as well as copyright details, may be found in the footer at the bottom of the page.

2. Registration Page

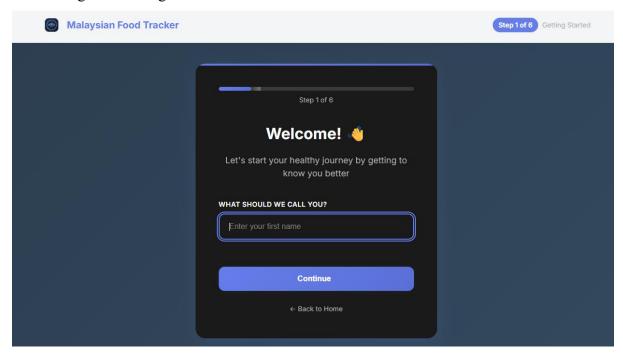


Figure 4.4.2.1 Registration Page

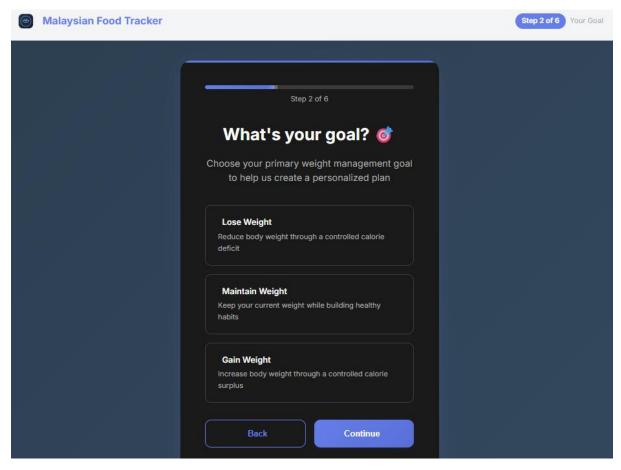


Figure 4.4.2.2 Registration Page (Continue)

Bachelor of Information Technology (Honours) Communications and Networking Faculty of Information and Communication Technology (Kampar Campus), UTAR

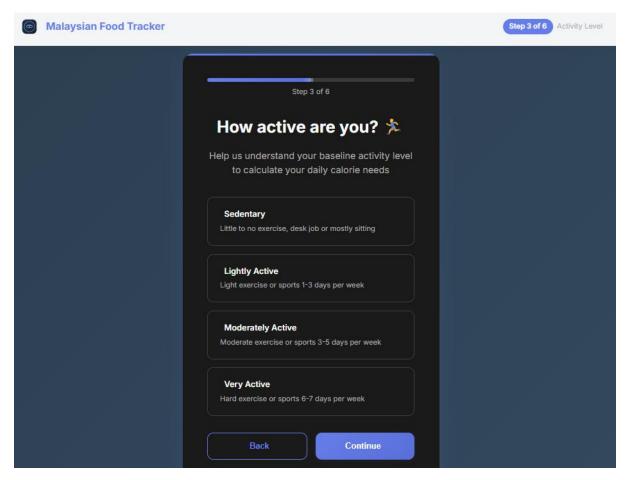
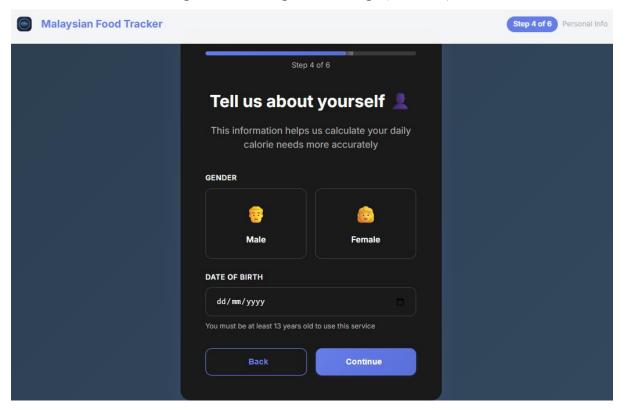


Figure 4.4.2.3 Registration Page (Continue)



Bachelor of Information Technology (Honours) Communications and Networking Faculty of Information and Communication Technology (Kampar Campus), UTAR

Step 5 of 6

Physical Statistics

Help us calculate your daily calorie needs with your height and weight information

HEIGHT

Feet ft Inches in

Switch to cm

CURRENT WEIGHT

Current weight Ibs

Switch to kg

GOAL WEIGHT

Goal weight Ibs

Switch to kg

Figure 4.4.2.4 Registration Page (Continue)

Figure 4.4.2.4 Registration Page (Continue)

Continue

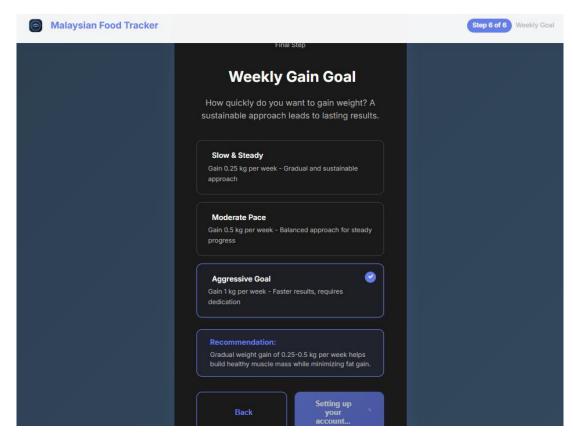


Figure 4.4.2.5 Registration Page (Continue)

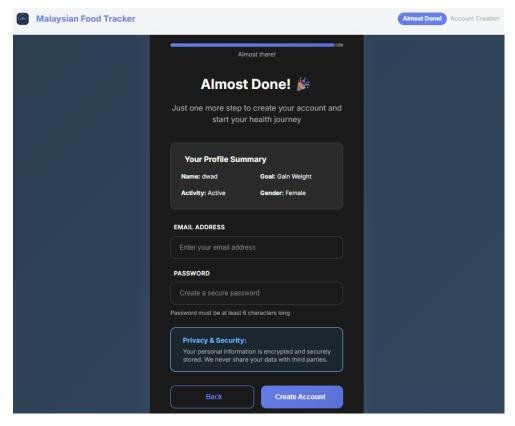


Figure 4.4.2.6 Registration Page (Continue)

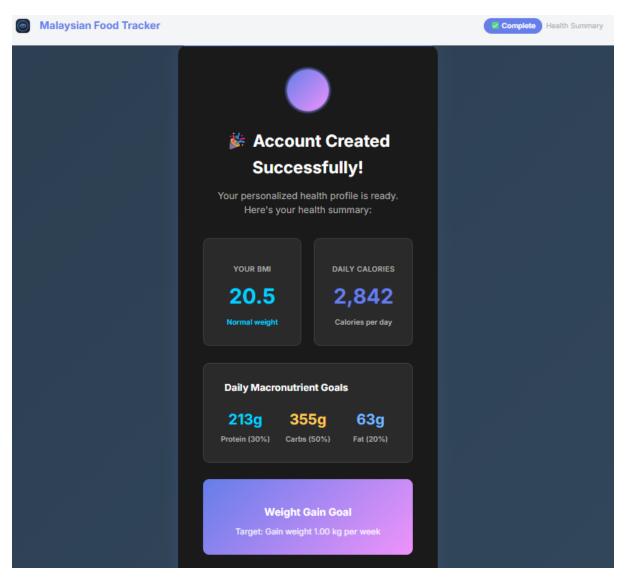


Figure 4.4.2.7 Registration Page (Continue)

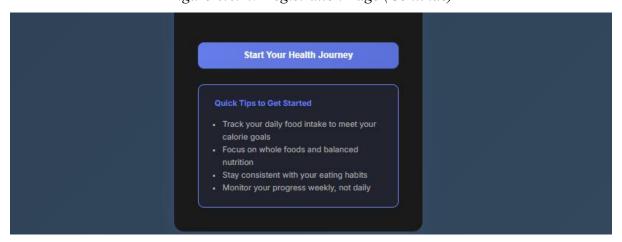


Figure 4.4.2.8 Registration Page (Continue)

As a thorough user onboarding system, the registration page walks new users through a methodical 6-step registration procedure to gather necessary personal data and establish their

own customized calorie monitoring account. The directory includes several interrelated PHP files that collectively collect user data in a methodical manner. InputName.php asks users for their name, followed by InputDetails.php, which asks them to choose whether they want to lose, maintain, or gain weight, and InputActivityLevel.php, which asks them how active they are each day. WeeklyGoal.php lets users choose their preferred weekly weight change rate, while Demographics1.php and Demographics2.php gather personal information such as gender, date of birth, height, current weight, and goal weight. Last but not least, Create.php manages the account creation process by gathering email addresses and passwords, verifying all previously acquired information, utilizing the demographic and activity data to do the required calorie calculations, and saving the entire user record in the database.

3. Login Page

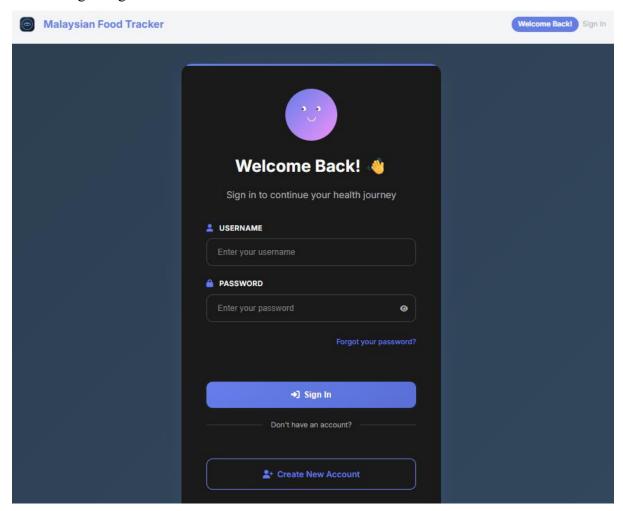


Figure 4.4.3.1 Login Page

The Malaysian Food Calorie Tracker's secure authentication gateway is the Login Page (LoginPage.php). It creates user sessions with username, user ID, and role information after verifying user credentials against the database using prepared queries and password hashing.

Role-based redirection is a feature of the system that, following successful login, automatically takes normal users to their Dashboard and admin users to the AdminPanel. A user-responsive animated character, a toggle for password visibility, instant form validation, error handling, and navigation links to account registration and password recovery are all included on the page.

4. Forgot Password Page

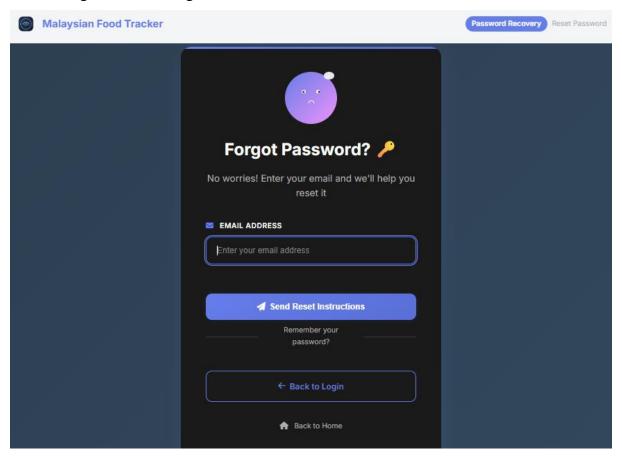


Figure 4.4.4.1 Forgot Password Page

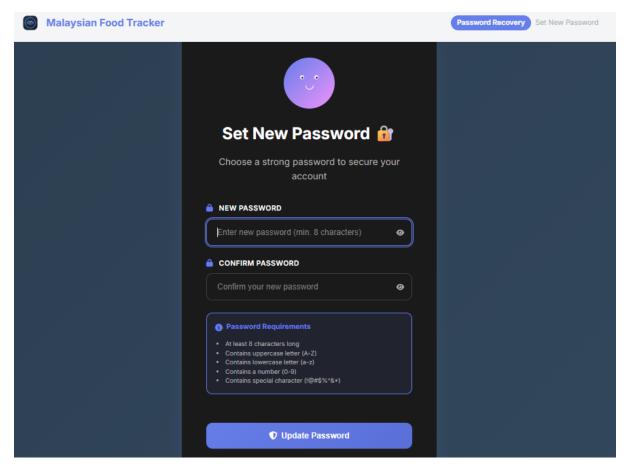


Figure 4.4.4.2 Forgot Password Page (Continue)

A simplified password recovery interface is offered via the Forgot Password page (ForgotPw.php), which allows users to reset their forgotten passwords by inputting their email address. After comparing the supplied email address with the user database, the system saves it in the session and sends users to the New Password page to reset their password. The page includes form validation, success/error messages, links to navigate back to login or home pages, and a responsive animated character that responds to user input and displays thought emotions. The interface offers a safe and easy password recovery experience, keeps the application's uniform design, and has helpful instruction information.

5. Dashboard Page

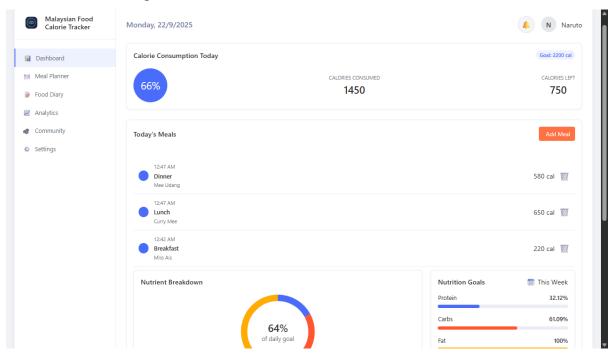


Figure 4.4.5.1 Dashboard Page

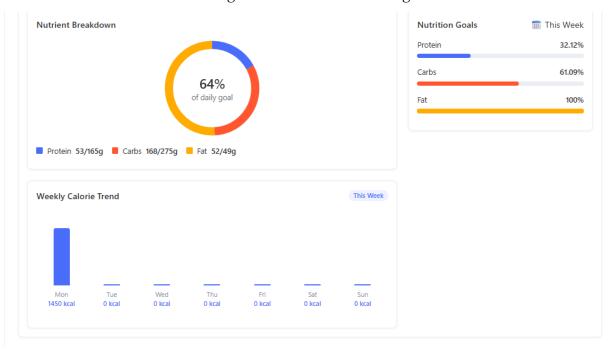


Figure 4.4.5.2 Dashboard Page (Continue)

The primary location for logged-in users to track their daily progress in tracking calories and nutrition is the Dashboard site (Dashboard.php). With a sidebar navigation menu that allows access to various app sections (Meal Planner, Food Diary, Analytics, Community, Settings), it boasts a comprehensive layout. It also shows important metrics like daily calorie consumption with percentage tracking, today's meal entries with add/delete capabilities, and

visual nutrition breakdowns for protein, carbohydrate, and fat intake in the form of donut charts and progress bars. Users can search and choose foods from the database, set meal times and amounts, and even request the addition of new foods using the dashboard's interactive meal addition modal. Goal progress tracking, notification integration, weekly calorie trends visualization, and responsive design elements are among the other features that give users a comprehensive picture of their health journey and simple access to all tracking features within the Malaysian Food Calorie Tracker app.

6. Meal Planner Page

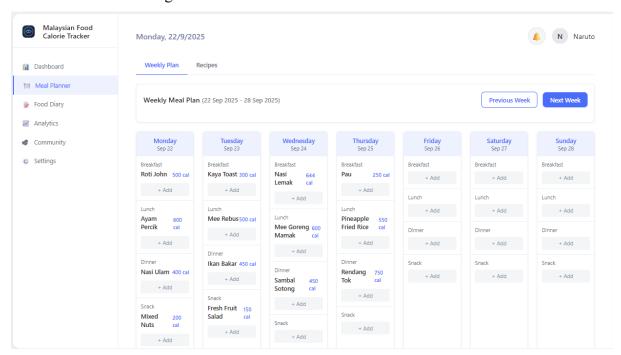


Figure 4.4.6.1 Meal Planner Page

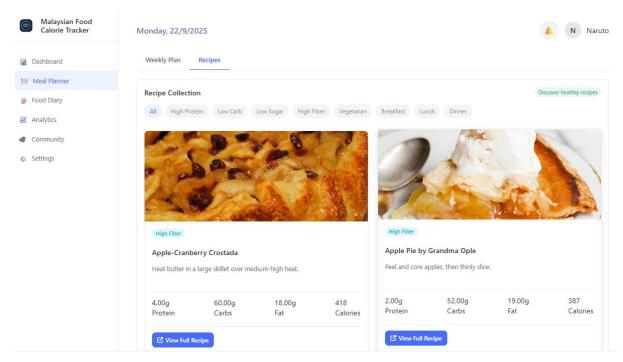


Figure 4.4.6.2 Meal Planner Page (Continue)

Users can browse recipes and plan their weekly meals with ease using the Meal Planner site (MealPlanner.php). It has two primary sections on a tab-based interface: Users can add, view, and remove planned meals for each day and meal time (breakfast, lunch, dinner, and snack) using Weekly Plan's seven-day grid layout. It also features an interactive modal for adding both custom meals with manual nutrition input and standard foods from the database. The Recipes area provides a searchable selection of nutritious recipes with pagination support, individualized recommendations based on the user's nutrition objectives, and filtering by dietary choices (High Protein, Low Carb, Vegetarian, etc.). The page gives users a comprehensive meal planning solution that easily connects with their calorie tracking and health objectives within the Malaysian Food Calorie Tracker application. It also has the ability to delete meals, request food for missing items, and maintain consistent navigation with other app sections.

7. Log Meal

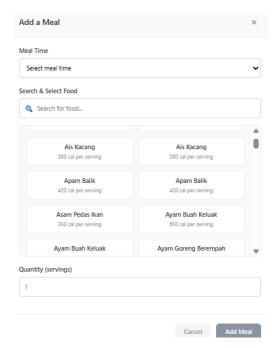


Figure 4.4.7.1 Log Meal Form Page

Users can add meals to their weekly meal plan and dashboard using the Standard and Custom Meal input options on the add meal form, which is a modal popup. Using a searchable grid interface, users may choose and search meals from the database in Standard mode. They can also choose the number in portions and designate the meal time (Breakfast, Lunch, Dinner, or Snack). For meals that are not in the database, users can manually enter a custom food name and particular nutritional information (calories, protein, carbohydrates, and fat) in the Custom Meal mode. The form features visual food selection with category icons, real-time search capabilities, form validation that only allows the submit button to be pressed when all required fields have been filled out, and integration with the meal request system for missing items. After being entered, the meal is added to the weekly plan grid at the designated time and date, giving users a variety of customizable meal arrangements for both custom entries and database meals.

8. Request Meal

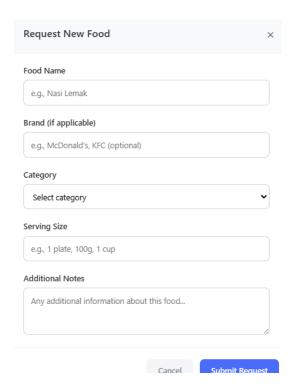


Figure 4.4.8.1 Request Meal Form Page

When users can't find the item they are looking for, they can request new items to be added to the database using the request meal form, which is a modal popup. Food Name (required), Brand (optional for branded items like McDonald's, KFC), Category selection from predefined options (Main Dishes, Rice & Noodles, Snacks, Beverages, Desserts, Fruits, Vegetables, Protein, Dairy, Fast Food, Other), Serving Size (requisite, such as "1 plate", "100g", and "1 cup"), and Additional Notes (optional textarea for additional information) are all fields on the form. The request is sent to../function/requestFood.php upon submission for admin approval and possible inclusion in the food database. This feature keeps the calorie tracking system's comprehensiveness by ensuring that users can help grow the Malaysian food database when they come across foods that aren't already available.

9. Food Diary Page

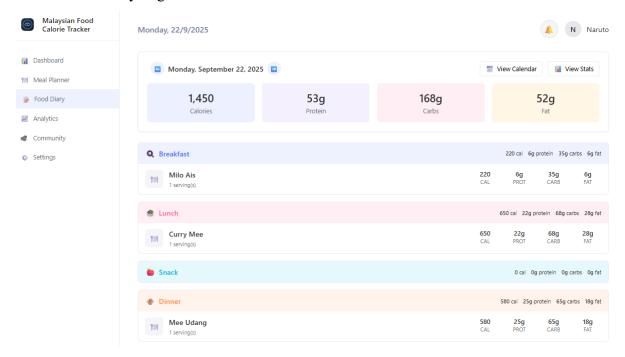


Figure 4.4.9.1 Food Diary Page

A thorough daily food tracking interface that shows extensive meal information arranged by meal times is offered to users via the Food Diary site (FoodDiary.php). Meal categories for breakfast, lunch, snack, and dinner each display each food item with their nutritional breakdown and quantities; a daily summary showing total calories, protein, carbs, and fat consumed; and date navigation with buttons for the previous and next day as well as a calendar modal for choosing specific dates. Additional features include a statistics modal with charts and analytics for various time periods (7, 30, 90 days) that show calorie trends, macro distribution, meal time analysis, and personalized insights, as well as a calendar modal for simple date selection with meal indicators indicating which days have logged entries. The Malaysian Food Calorie Tracker application gives users a comprehensive picture of their daily food intake and ongoing eating trends by automatically updating the interface when users change dates and retrieving meal information and nutritional summaries from the backend.

10. Analytics Page

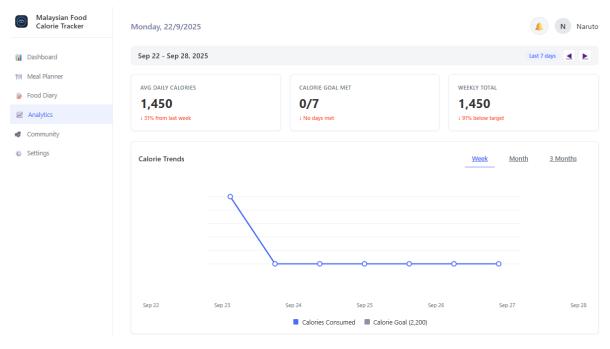


Figure 4.4.10.1 Analytics Page

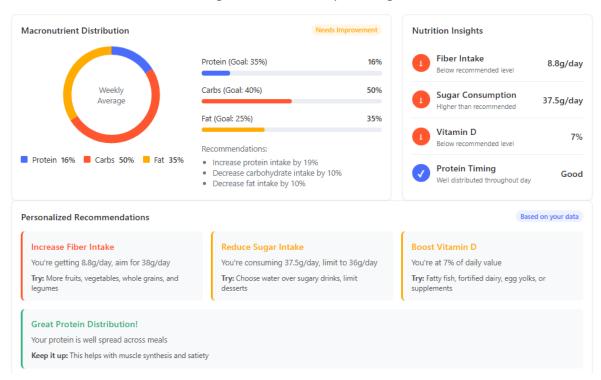


Figure 4.4.10.2 Analytics Page (Continue)



Figure 4.4.10.3 Analytics Page (Continue)

Users can customize periods of time (week, month, or three months) to view detailed graphs of data and insights about their eating habits and nutrition on the Analytics site (Analytic.php). The page includes interactive charts, such as calorie trend line graphs with goal indicators and SVG-powered visualizations, macronutrient analysis with donut charts that show the distribution of protein, carbohydrates, and fat against suggested percentages with personalized recommendations, and statistical summaries that display average daily calories with percentage changes from prior periods, calorie goal achievement rates, and weekly totals. Meal type analysis with bar charts displaying calorie distribution across breakfast, lunch, dinner, and snacks, nutrition insights monitoring fiber intake, sugar consumption, vitamin D levels, and protein timing breakdown with color-coded status indicators, and tailored suggestions based on the user's gender, nutrition issues, and eating habits are additional features. With its adaptable design elements, tooltips for chart interactions, and date navigation controls, the website gives users comprehensive statistics to comprehend their eating habits and make wise health choices within the Malaysian Food Calorie Tracker app.

11. Community Page

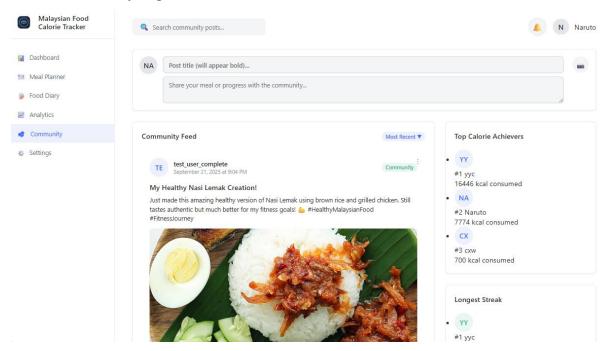


Figure 4.4.11.1 Community Page

Through postings, comments, and engagement tools, users can communicate with one another on the Community page (Community.php), which functions as a social platform. To share their meal accomplishments or accomplishments with the community, individuals can create posts on the website by writing titles, adding captions, and uploading photographs. Each post includes user avatars, timestamps, content, and interactive buttons for likes, comments, and reposts. The main content area offers a community feed with filtering options (Most Recent, Most Liked) and search functionality to identify specific articles. Additional features include leaderboards that display the top contributors, longest streaks, and calorie achievers; post management with three-dot menus for removing or reporting inappropriate content; repost functionality that lets users share other people's posts with optional comments; and comment sections that allow real-time posting and deletion. Through social features and competition elements, the interface promotes community interaction while maintaining an integrated look with the rest of the application.

12. Setting Page

You'll be signed out of your account.

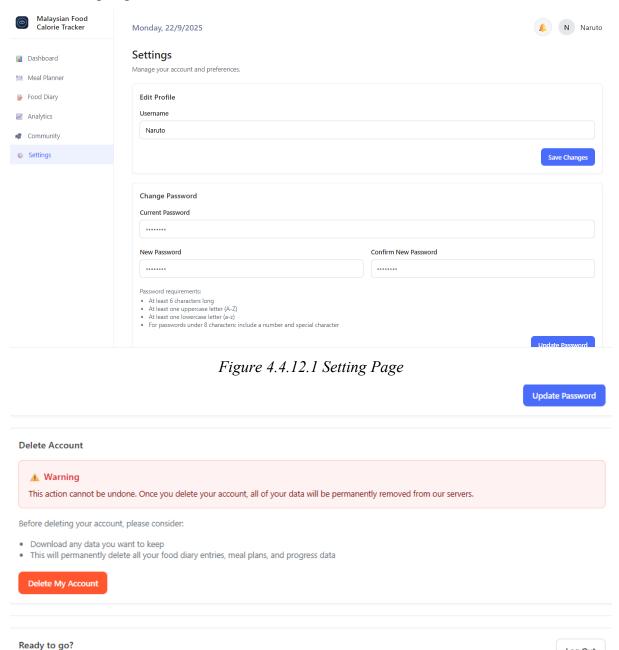


Figure 4.4.12.2 Setting Page (Continue)

Through a simple interface consisting of three primary sections, the Settings page (SettingPage.php) offers customers extensive account administration options. Users can edit their usernames with real-time validation, such as length constraints, character limitations, and unique checks, through the Edit Profile area. In addition to protecting against common weak passwords, the Change Password area provides secure password changes with current password verification and enforced complexity requirements, including minimum length, uppercase, lowercase, number, and special character restrictions. To completely delete their Bachelor of Information Technology (Honours) Communications and Networking Faculty of Information and Communication Technology (Kampar Campus), UTAR

Log Out

account and any related data, users must input "DELETE" in the Delete Account area, which has a thorough warning system with two confirmation prompts. Other features include a logout section with verification dialogs, success modals for password modifications, alert alerts for user input, and real-time validation of forms with AJAX submissions and loading states. In addition to offering thorough error handling for every action and session safety with timeout protection, the page also ensures the integrity of data through server-side validation.

13. Admin Panel Page

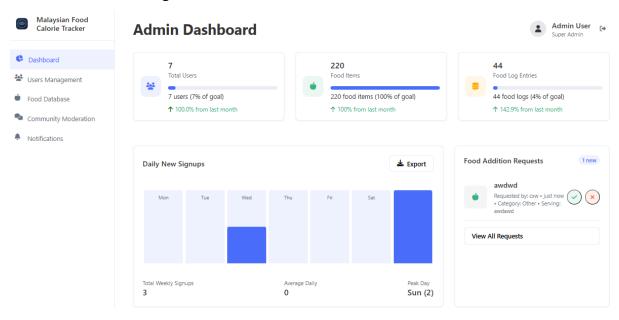


Figure 4.4.13.1 Admin Panel Page

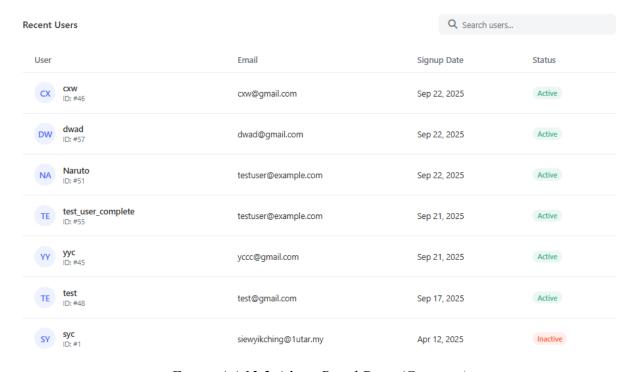


Figure 4.4.13.2 Admin Panel Page (Continue)

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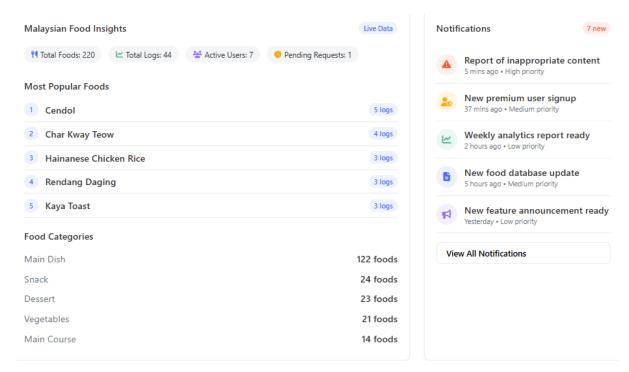


Figure 4.4.13.3 Admin Panel Page (Continue)

The Malaysian Food Calorie Tracker program is managed using the extensive administrative dashboard provided by the Admin Panel page (AdminPanel.php). Key information, such as the total number of users, food items, and food log entries with progress bars and monthly growth percentages, are displayed on statistics overview cards on the page. The primary content consists of a recent users table with search and pagination for user management, a food addition requests section displaying pending submitted by users food requests with approve/reject functionality, and a daily signup chart that visualizes weekly user registration trends with peak day analytics. A notifications panel showcasing recent alerts and administrative tasks with priority signals, Malaysian Food Insights showcasing popular foods, food categories, and system metrics, and interactive features like real-time food request approval/rejection with AJAX functionality are additional components. To efficiently manage the application's operations and user base, the dashboard gives administrators access to extensive system monitoring, user management tools, and useful information.

14. User Management Page

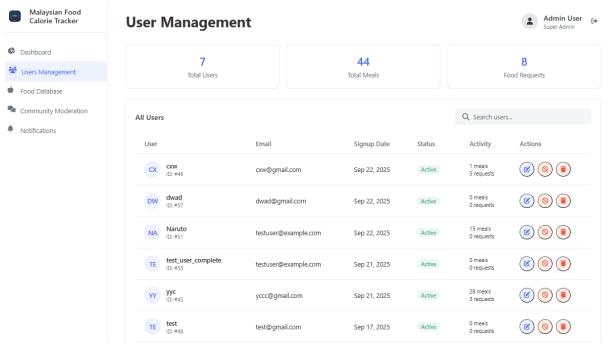


Figure 4.4.14.1 User Management Page

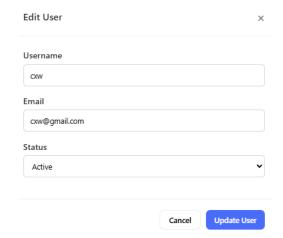


Figure 4.4.14.2 User Management Page (Continue)

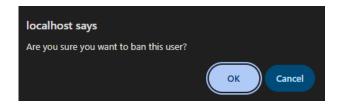


Figure 4.4.14.3 User Management Page (Continue)

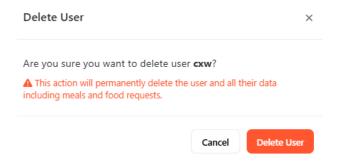


Figure 4.4.14.4 User Management Page (Continue)

Admin can monitor user behavior and manage user accounts in the Malaysian Food Calorie Tracker application with the use of the User Management page (UserManagement.php). A searchable user table with pagination displaying user details such as usernames, emails, signup dates, activity status, and engagement indicators (meals and requests) is included on the page, along with statistical overview cards that show the total number of users, meals logged, and food requests submitted. Additionally, there are administrative actions such as edit, ban/unban, and delete functionality for each user account. Key features include color-coded badges for status management that show Active, Pending, Inactive, or Banned states; modal messages for editing user information (username, email, and status); confirming user deletions with alerts about data loss; real-time search functionality with rejected input for locating specific users; and comprehensive user operations, such as progressive deletions that remove corresponding meals and food requests to preserve database integrity. For effective community administration, the interface offers administrators comprehensive user activity analytics, account moderation tools, and effective user monitoring.

15. Food Database Management Page

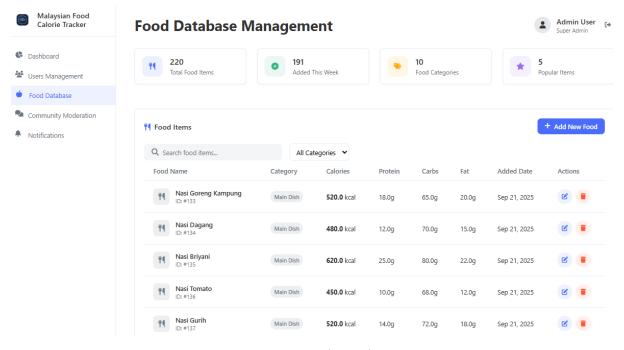


Figure 4.4.15.1 Food Database Page

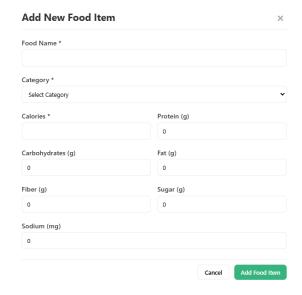


Figure 4.4.15.2 Food Database (Add New Food Item Form) Page

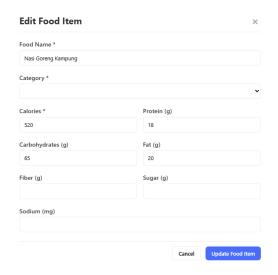


Figure 4.4.15.3 Food Database (Edit Food Item Form) Page

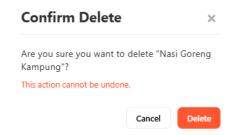
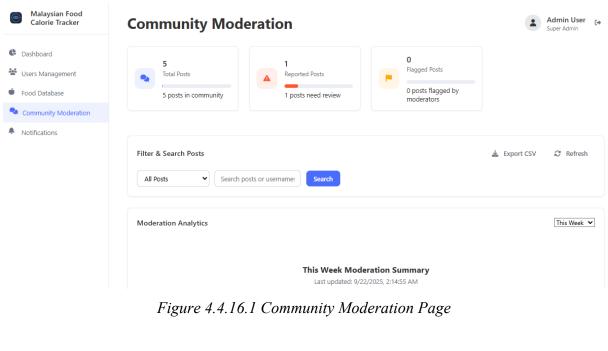


Figure 4.4.15.4 Food Database (Delete Exist Food Item) Page

The application's nutrition database is managed using a thorough administrative interface provided by the Food Database page (FoodDatabase.php). In addition to a visible food table with category filtering, paging, and detailed nutritional information (calories, protein, carbs, and fat), the page includes statistical overview cards that show the total number of food items, recent additions this week, food categories count, and popular items metrics. It also offers comprehensive CRUD operations, such as add, edit, and delete functionality through dialog with full nutritional input fields. Key features include: modal interfaces for adding new foods with complete nutritional profiles, editing existing items, and confirmation dialogs for deletions; analytics sections that display food category distribution with progress bars and most popular foods based on meal usage statistics; category management with color-coded badges and icons for visual organization across 10 food categories and category substitutes handling and combined search/filter persistence. The interface gives administrators strong tools to keep track of food consumption trends, maintain accurate nutritional data, and guarantee thorough coverage of all food categories necessary for user meal tracking.

16. Community Moderation Page



0 0 0 0 Total Actions Posts Hidden Posts Flagged Active Days Content removed Days with moderat performed from public view review activity **Community Posts Management** test_user_complete 9/21/2025, 9:04:17 PM My Healthy Nasi Lemak Creation! Just made this amazing healthy version of Nasi Lemak using brown rice and grilled chicken. Still tastes authentic but much better for my fitness goals! 🍐 #HealthyMalaysianFood #FitnessJourney

Figure 4.4.16.2 Community Moderation Page (Continue)

A thorough administrative interface for controlling and regulating user-generated content on the community platform is provided via the Community Moderation page (CommunityModeration.php). In addition to comprehensive moderation tools that include Bachelor of Information Technology (Honours) Communications and Networking Faculty of Information and Communication Technology (Kampar Campus), UTAR

specific post actions (hide/unhide, flag/unflag, delete) and batch actions for multiple posts, the page offers statistical overview cards that show total posts, reported posts, flagged posts, and moderation activity statistics with progress indicators. Administrators can view posts by status (all, reported, flagged, recent, and popular) and use real-time search functionality. Detailed post management with status badges, engagement metrics (likes, comments, reports), viewing capabilities for user information and reports, moderation analytics that display daily activity trends, the most active moderators, and period-based statistics (today, week, and month), integration of user profiles that offer instant access to user statistics and management history, and export functionality for CSV data extraction with filtering options are some of the essential elements. Through both manual review and automatic tracking mechanisms, the interface gives administrators strong capabilities for upholding community standards, monitoring moderation activity, answering user reports, and guaranteeing proper content control.

17. Notifications Page

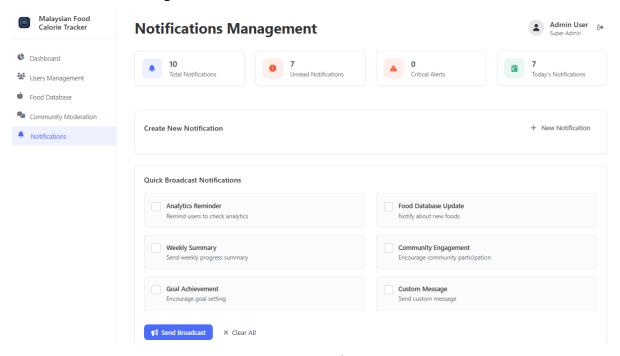
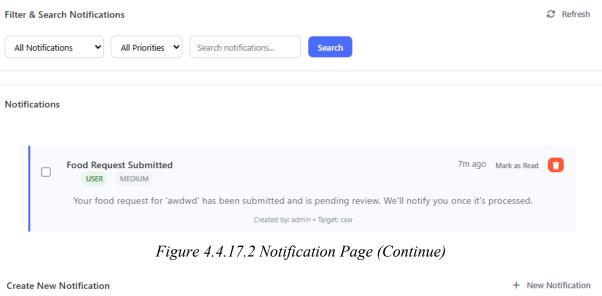


Figure 4.4.17.1 Notification Page



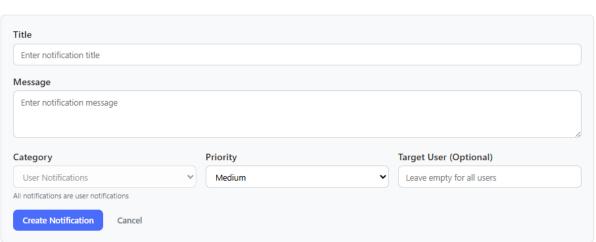


Figure 4.4.17.3 Notification Page (Continue)

Within the Malaysian Food Calorie Tracker project, the Notifications page (Notifications.php) functions as a thorough administrative interface for controlling and disseminating notifications to users. The page has statistical overview cards that show the number of notifications, unread notifications, critical alerts, and total notifications. It also has tools for creating notifications that let administrators create custom notifications with titles, messages, priority levels (low, medium, high, and critical), and the ability to specify a target user. Additionally, it has quick broadcast functionality that offers predefined message templates for weekly summaries, goal achievements, analytics reminders, food database updates, and community engagement with custom message options. Important features include a comprehensive notification display that shows read/unread status, priority indicators, category badges, timestamps, and individual action buttons; predefined notification templates for common user interactions such as new registrations, achievements, food approvals, post

reports, and weekly summaries; and advanced filtering and search features for viewing notifications by status (all, unread, user, food, community) and priority levels. Bulk management operations allow you to mark multiple notifications as read or delete selected items. While keeping all system alerts categorized and handled according to importance, the interface gives administrators strong tools for user communication, engagement monitoring, and systematic notification management.

Chapter 5: System Implementation

5.1 Hardware Setup

Hardware Description	Specifications
Laptop Model	Lenovo Ideapad 5
Processor	AMD Ryzen 5 5500U with Radeon Graphics
Graphic Card	496MB AMD Radeon (TM) Graphics
Memory	4GB DDR4 RAM
Storage	477GB
Input Device	Mouse and Keyboard

Table 5.1 Hardware Specifications

The hardware that will be required to develop and implement this project are a laptop, mouse and keyboard. A laptop is the main device for the whole developing process; this project will be using Lenovo Ideapad 5. This laptop is equipped with AMD Ryzen 5 5500U with Radeon Graphics processor, 8GB RAM memory and 477GB storage. In addition, the laptop uses 496MB AMD Radeon (TM) Graphics card to present graphical content and interface. A mouse and keyboard are crucial to control the input of data. The hardware mentioned acts as a main development environment for the building of this project. It has been used to test progress during the development process.

5.2 Software Setup

Software Description	Specifications
Operating System	Window 11
Web Browser	Google Chrome
Visual Studio Code	Version 1.103.2
Front-End	HTML, CSS, Javascript
Back-End	PHP
Database	MySQL

Table 5.2 Software Specifications

The operating system operated in the laptop mentioned in Table 5.2 is Window 11. It is used to provide services for laptop programs like website programs. Google Chrome serve as the web browser to display the system output. Visual Studio Code acts as Integrated Development Environment (IDE) for development and implementation process. Other than, the front-end technologies to be applied for developing the website's graphical user interface included HTML, CSS, Bootstrap and JavaScript. Meanwhile, the project is coded using PHP

programming language with Laravel framework. MySQL that is supported by phpMyAdmin act as Database Management System (DBMS) for storing and retrieving website data.

5.3 Setting and Configuration

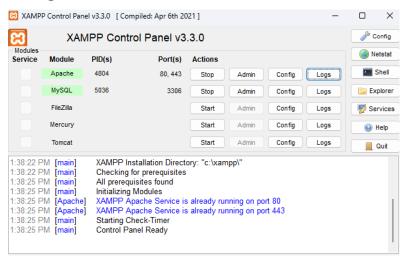


Figure 5.3.1 XAMPP with Apache and MySQL

To support both server and database functionalities, XAMPP was used as the main local development environment during the project's development. While MySQL acted as the database system to store and manage all pertinent project data, including users, meals, recipes, and community activities, Apache was utilized to process HTTP requests and facilitate seamless communication between the web application and the client. Furthermore, phpMyAdmin, which came with XAMPP, had an intuitive database management interface that made it simpler to create tables, add information, and run queries throughout the development stage. During the installation phase, this configuration guaranteed effective testing and deployment of the Malaysian Food Calorie Tracker system.

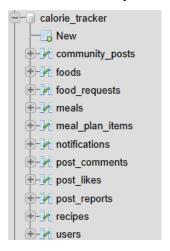


Figure 5.3.2 Database Table in phpMyAdmin

5.4 Testing Setup and Test Result

1. User Site

No	Test Action	Test Result	Status
1	Register with valid email	Register successfully	PASS
2	Register with registered email	Registration failed and	PASS
		message email has been	
		registered is shown	
3	Log in with registered credentials	Login successfully and	PASS
		redirected to dashboard	
		page	
4	Log in with incorrect credentials	Login failed and message	PASS
		incorrect email or	
		password is shown	
5	Reset password with a registered	Password is reset	PASS
	email	successfully and redirected	
		to the login page	
6	Reset password with unregistered	Message email address is	PASS
	email	not registered is shown	
7	Log a meal using the add meal form	Meal is added successfully	PASS
		to the Food Diary and	
		displayed in the Dashboard	
		page. The calorie counts	
		and nutrition info are	
		updated	
8	Plan a meal for a specific mealtime	Meal is added successfully	PASS
	and day	and display in the Meal	
		Planner page	
9	Access to recipe tab	Recipe list is displayed	PASS
10	Access to analytics page	The visual chart for the	PASS
		specific period is displayed	
11	Create a post with text or image	The post is successfully	PASS
		created and displayed	
12	Like/ repost/ comment other's post	Like count and comment	PASS
		display below the post	

13	Delete own post	Post is successfully deleted	PASS
		from the community feed	

Table 5.4.1 Test Case for User

2. Admin Site

No	Test Action	Test Result	Status
1	Log in with admin credentials	Login successfully and	PASS
		redirected to admin page	
2	Log in with incorrect credentials	Login failed and message	PASS
		incorrect email or	
		password is shown	
3	Access to the Food Request section	List of pending food	PASS
		requests is displayed	
4	Approve a food request	The requested food is	PASS
		successfully added in the	
		food database	
5	Deny a food request	The request is removed	PASS
		from the pending list and	
		not added in the food	
		database	
6	Access to User Management section	List of registered users	PASS
		with the option to	
		edit/ban/delete user is	
		displayed	
7	Edit a user's profile	The user's info is	PASS
		successfully edited and	
		stored in the database	
8	Ban a user	The user's account status	PASS
		changed to "banned" which	
		user is unable to login	
9	Delete a user's account	User's associated data and	PASS
		account are deleted	
		permanently from the	
		database	
L	l .	1	I

10	Access to Food Database section	List of food items in the	PASS
		database is displayed with	
		the option of edit or delete	
11	Add a food item to the database	New food item is	PASS
		successfully added	
12	Edit the nutritional information of	Editable and saved in the	PASS
	existing food item	database	
13	Delete a food item from the database	Item is deleted from the	PASS
		database	
14	Access to the Community	User-generated post is	PASS
	Moderation section	shown	
15	Delete/hide/flag a post	Post is successfully	PASS
		delete/hide/flag from the	
		community feed	
16	Access to the Notification section	Page of creating or	PASS
		broadcast notification is	
		displayed	
17	Create notification/Broadcast	Notification is successfully	PASS
	notification to user	sent to the user	

Table 5.4.2 Test Case for Admin

Chapter 6: System Evaluation And Discussion

6.1 Project Challenges

The Malaysian Food Calorie Tracker's creation involved a number of technical problems that needed innovative solutions and precise architectural design. Session management and database integration turned out to be major obstacles, especially when it came to implementing secure session timeout functionality for various user roles (admin, regular users) and avoiding file session conflicts. This task necessitated a systematic reworking of session_start() calls across the entire codebase. Furthermore, creating a comprehensive Malaysian food database with precise nutritional data for regional specialties and local dishes like Nasi Lemak and Rendang presented special challenges due to localization and cultural adaptation. These challenges included accurate calorie calculations for traditional serving sizes and careful classification by Malaysian cuisine types.

Moreover, to maintain a consistent design style and guarantee responsive functionality across devices, multi-tier user experience design required developing clearly differentiated interfaces for admin (with analytics dashboards, user management, and food database moderation) and end users (with meal tracking, community features, and personalized dashboards). Automated goal-setting based on user demographics and activity levels, weekly calorie trend analysis, macro tracking with visual chart representations, and complex nutritional calculations were among the issues associated with real-time data processing.

The development of a strong system for user-generated content, food request submissions, and administrative approval workflows was necessary for Community Features and Moderation. Notification systems and leaderboards were also put in place to promote user interaction. The project's scope also grew to include advanced functions like meal planning, analytics reminders, and integration with notification systems. These features necessitated careful coordination between frontend PHP processing and backend JavaScript interactions while preserving user session integrity and data consistency throughout the application lifecycle.

6.2 Objectives Evaluation

1. Comprehensive Malaysian Food Database Development

With several noteworthy strengths and room for further growth, the creation of an extensive food database tailored to Malaysian eating habits has been mostly accomplished. With a well-structured 'foods' table that includes the necessary nutritional fields (calories, protein, carbs, fat, fiber, sugar, and vitamin d) and Malaysian-specific classifications like

'malaysian_cuisine_type' and comprehensive 'serving_size' specifications that take into account local portion standards, the project successfully built a strong database infrastructure. The database currently includes more than 200 Malaysian meals, showing a notable advancement in the direction of thorough coverage of regional cuisine. By carefully classifying foods according to Malaysian cuisine types and including traditional dishes like Nasi Lemak and Rendang as well as regional specialties with precise nutritional profiles computed for typical Malaysian serving sizes (plates, cups, traditional portions), cultural authenticity has been given top priority. Through an advanced food request system, users can add missing foods with comprehensive details like brand specifications, category classifications, and serving size descriptions. Administrators will then review and approve the requests through a dedicated moderation interface, allowing the system to support user-driven expansion.

A sustainable system for continuous database expansion is indicated by the well-developed administrative tools for database management, which include analytics tracking of popular Malaysian foods, categorization systems, and approval workflows for new food additions. All things considered, this goal has been accomplished with a strong basis that caters to Malaysian dietary requirements and offers scalable infrastructure for future growth and improvement of the food database to more accurately reflect the entire range of Malaysian cuisine.

2. Intuitive Web Application for Meal Logging and Dietary Management

An incredibly well-executed web application for meal tracking and nutritional control has been developed, showcasing advanced user experience design and extensive functionality that surpasses that of standard calorie tracking apps. A contemporary, responsive dashboard layout with clear iconography (Dashboard, Meal Planner, Food Diary, Analytics) and an organized visual organization using a polished color palette with primary blues, success greens, and warning oranges that efficiently guide user actions is how Navigation and User Interface Design achieves exceptional intuitiveness.

Moreover, an elegant modal-based system streamlines the meal recording functionality by enabling users to choose meal times (breakfast, lunch, dinner, and snack), search and choose foods from the extensive Malaysian database with real-time sorting, specify quantities, and add meals with instant visual feedback—all without requiring page refreshes for the best possible user experience. Numerous advanced visualization techniques are used to present calorie monitoring, such as weekly trend analysis with bar charts that give historical context for dietary patterns, detailed macro breakdowns with dynamic donut charts that display protein/carb/fat ratios, and circular progress indicators that show the percentage of daily goals consumed.

Furthermore, Dietary Goal Management offers customizable macro targets with real-time progress tracking, visual progress bars that clearly show achievement levels for protein, carbohydrate, and fat intake, and computerized calorie recommendations based on user demographics (age, gender, height, weight, and activity level). Meal deletion with confirmation dialogs, food requests for missing items, alerting systems, analytics providing weekly insights, and community features that promote sustained engagement are examples of advanced features. The web application effectively strikes a balance between feature richness and ease of use, enabling experienced users comprehensive nutritional analytics and simple meal reporting for novice users. This makes it ideal for a wide range of user demands and dietary goals. With implementation quality comparable to commercial fitness software, this goal has been fully accomplished.

3. Long-Term Calorie Tracking and Behavioural Insights

Comprehensive calorie tracking, nutritional goal-setting, and behavioral insights have all been implemented with remarkable effectiveness, creating a complex system that offers insightful analytics that support long-term, healthful eating practices. Multiple time-based views, such as daily consumption overviews with real-time progress indicators, weekly calorie trend charts that show consumption patterns over seven-day periods, and historical data retention that lets users examine their eating patterns over extended periods of time which allowing for the recognition of long-term trends and seasonal variations in dietary behavior—make time-based Calorie Tracking exceptionally well-developed.

Through customizable macro targets for protein, carbs, and fat with percentage-based tracking, adaptive goal adjustment capabilities that adapt to user progress and shifting lifestyle factors, and automated calorie recommendations based on user demographics (age, gender, height, weight, and activity level) using established nutritional guidelines, Nutritional Goal Establishment exhibits advanced personalization. With its comprehensive analytics dashboards that show eating trends, popular food selections, meal timing analysis, and nutritional balance evaluations, Behavioral Insights Generation is very advanced and helps users comprehend their relationship with food in ways that go beyond basic calorie tracking. By acknowledging accomplishments, highlighting progress, and offering gentle direction rather than tight restrictions—which research indicates is more helpful for long-lasting behavior change—the approach effectively tackles the psychological component of habit formation. This goal has been fully accomplished with high-quality implementation that gives users the resources, knowledge, and inspiration they need to create and sustain long-term healthy eating habits.

4. Recipe and Food Selection Recommendation

A personalized recipe and food recommendation system has been partially implemented, with the necessary infrastructure in place. However, substantial improvement is still needed to fully achieve the stated goal of personalized recommendations based on activity levels and daily calorie consumption. Recommendation loading interfaces in the meal planner and basic macro-nutrient analysis that produces straightforward recommendations such as "Increase protein intake by X%" or "Maintain current fat intake" in response to goal deviations.

Through extensive user identification with stored demographic data (age, gender, height, weight, and activity level), automated calorie intake recommendations based on established nutritional formulas, comprehensive macro tracking with fat, protein, and carbohydrate goals, and synchronization with the Malaysian food database that contains nutritional information required for intelligent recommendations, Technical Foundation demonstrates a strong foundation. Through a complex meal planner interface with weekly views, the ability to create unique meals, food search and selection features, and meal plan storage systems that may support recommendation algorithms, Meal Planning Infrastructure offers the structural framework for recommendations.

Then, featuring weekly trend analysis, macro distribution computations, nutritional gap identification, and the creation of individualized feedback that serves as the foundation for wise suggestions, Analytics and Insights Generation demonstrates sophisticated skills in assessing user consumption patterns. The lack of real algorithmic recommendation engines that use user data to recommend particular foods or recipes, the limited intelligent meal suggestions based on remaining daily calorie budgets or activity level adjustments, the lack of machine learning features that would improve recommendations over time based on user acceptance patterns, and the lack of recipe filtering based on user preferences or nutritional needs are some areas that need development.

Chapter 7: Conclusion and Recommendation

7.1 Conclusion

A thorough web-based tool that successfully blends technological advancements, cultural relevance, and nutritional research is the Malaysian Food Calorie Tracker. By combining a well-organized database with more than 200 entries for Malaysian foods, session management systems with timeout protection, real-time nutritional analytics, and responsive web design that works flawlessly on all devices, the project exhibits excellent technical execution. This basis guarantees the platform's dependability and accessibility for a broad user base, providing an effective tool for managing nutrition and health.

The project's ability to adapt to many cultures is one of its main advantages. By combining traditional portion sizes, authentic food classification, and a broad range of well-known meals from Nasi Lemak to local specialties, this tracker is specifically designed for Malaysian cuisine, in contrast to generic calorie monitoring systems. In addition to improving user engagement, this localization yields more accurate statistics that accurately represent actual eating behaviors, making the food tracker a useful and relevant tool for Malaysians.

The project's unique attributes and user-friendly interface make it an excellent choice for users. Users may keep an eye on their food intake in an interesting and interactive way with features including modal-based meal logging, circular indicators for tracking progress, and comprehensive weekly trend analysis. By enabling users to match the system to their lifestyle and health requirements, personalized goal-setting tools further improve usability. Simultaneously, community-focused features like interactive posts promote sustained engagement and inspiration.

The system has enterprise-level features that improve management and scalability from an administrative standpoint. Administrators are given the control they need to ensure accuracy, security, and a top-notch user experience through features like comprehensive analytics dashboards, user management systems, database moderation tools, and approval workflows for user-generated content. These backend features guarantee that the platform will continue to be viable and flexible enough to meet evolving needs.

In summary, the Malaysian Food Calorie Tracker is a remarkable accomplishment that combines user-centered design, cultural sensitivity, and technical stability into a single, integrated solution. It offers a robust and scalable structure for future expansion in addition to satisfying users' present needs. This project makes a significant contribution to the field of

health technology in Malaysia and possibly the larger Southeast Asian region since it is a great illustration of how technology can be localized to address actual health concerns.

7.3 Recommendation

The finalization of the AI-powered recommendation engine is the first and most urgent suggestion for the Malaysian Food Calorie Tracker. An advanced recommendation system would greatly increase the usefulness of the current system, even if it already offers precise calorie tracking and customized goal-setting. The system might offer meal recommendations with suitable portion sizes, complimentary pairings, and scheduling guidance by examining user consumption patterns, daily caloric requirements, and nutritional gaps. In addition to making the platform more user-friendly, this improvement would turn it from a passive tracking tool into an active nutrition advisor.

Extending the Malaysian food database to more accurately reflect true local eating customs is another top priority. The system currently has more than 200 food entries, but in order to properly incorporate Malaysian street food, Pasar Malam snacks, Mamak cuisine, and well-known chain restaurant dishes, this coverage needs be increased to at least 500 items. The technology will give customers more precise monitoring capabilities and enhance its cultural authenticity by adding regional variations to the database, such as Sarawak Laksa, Penang Char Kway Teow, and contemporary fusion dishes.

Since the majority of Malaysians use smartphones to access health applications, it is also imperative to improve mobile responsiveness. The platform should be improved into a Progressive Web App (PWA) with offline capabilities, meal reminder push notifications, and mobile layouts that are optimized. By enabling users to simply log meals while on the go, these additions will boost system adoption and engagement.

The project should incorporate machine learning-powered health insights and advanced analytics in the medium term. The system might offer monthly reports, identify possible nutritional deficiencies, and recommend predictive measures for users aiming to achieve fitness or weight management objectives by identifying long-term patterns in food behavior. The tracker's functionality would be enhanced by this analytical capability, which would also establish it as a more advanced and helpful health platform.

Another important development path is represented by social and community-driven features. A sense of group accountability and incentive will be fostered by adding recipe sharing, health challenges, and nutritionist Q&A sessions to the community part. Furthermore, groups specifically designed to address dietary issues like managing diabetes, losing weight,

or developing muscle would give users a place to meet and share tips in a Malaysian setting that is culturally appropriate.

The system must further interface with outside platforms and services to enhance its function inside the health ecosystem. More precise data gathering on activity levels would be possible with the development of APIs for Malaysian healthcare applications and fitness trackers like Fitbit, Apple Health, and Google Fit. In addition to improving calorie recommendations, this integration places the tracker inside a larger, integrated health management system.

Moreover, it is strongly advised to incorporate multilingual support for long-term strategic growth. The platform may better serve Malaysia's diverse population by adding options in Tamil, Chinese, and Bahasa Malaysia. Enhancing accessibility for senior citizens and those with disabilities through features like voice-based meal logging in regional languages would increase the system's inclusion.

All things considered, these suggestions offer a clear path forward for the Malaysian Food Calorie Tracker's transformation from a strong and culturally appropriate local solution into an all-encompassing, AI-powered health ecosystem. The project has the ability to become a model of culturally appropriate health technology for Malaysia and beyond by concentrating on short-term technical improvements, medium-term strategic advancements, and long-term scalability options.

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Appendix





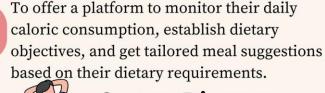
Malaysian Food Calorie Tracker



Introduction

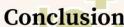
This system assist users in keeping tracks on their caloric consumption, tracking their nutritional objectives, and selecting healthier foods.

Objective





System Diagram



• Malaysian Food Calorie Tracker is an inventive tool that enables users to measure their progress, make better meal choices, and meet their nutritional objectives. Better health outcomes for Malaysian users are the goal of this initiative, which focuses on localized data and offers an intuitive interface.

