MOOD-TO-MEAL - Mood-based food recommendation app offering personalized meal suggestions with embedded YouTube reviews

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PROJECT REPORT
Submitted by

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BONAFIDE CERTIFICATE

Certified that this Project titled "MOOD-TO-MEAL -APP " is the bonafide work of "SWEDHA J (2116220701296)" who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

MoodToMeal is an innovative Android application designed to bridge the gap between emotional well-being and personalized food choices. Developed entirely using Kotlin, the app focuses on understanding a user's current emotional state and suggesting appropriate food items that align with their mood. In today's fast-paced world, people often make impulsive or unhealthy food decisions driven by emotions such as stress, sadness, or even excitement. *MoodToMeal* aims to tackle this by offering emotion-aware food recommendations, creating a comforting and personalized culinary experience.

The application allows users to either manually select their mood from predefined categories (such as Happy, Sad, Angry, Anxious, Excited, or Tired) or optionally enter a short text describing how they feel. Using basic sentiment analysis or keyword detection, the app determines the dominant mood and retrieves a curated list of food suggestions known to help improve or match that emotional state. For example, when feeling sad, the app may suggest comfort foods like warm soup or chocolate desserts, whereas an excited mood may lead to vibrant, fun foods like tacos or mocktails.

To make the experience more engaging and informative, each suggested dish is accompanied by a YouTube review link. This integration allows users to watch real reviews of the food item from trusted creators before making a decision, adding a layer of trust and entertainment to the food selection process.

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LIST OF ABBREVIATIONS

S. No	ABBR	Expansion
1`	API	Application Programming Interface
2	SDK	Software Development Kit
3	XML	Extensible Markup Language

CHAPTER 1
INTRODUCTION

1.1 GENERAL

In today's fast-paced and emotionally dynamic world, our moods significantly influence daily decisions, including what we choose to eat. People often turn to food as a source of comfort, celebration, or relief, but rarely are these choices made consciously with emotional well-being in mind. *MoodToMeal* is a Kotlin-based Android application that explores this very intersection of emotion and food, aiming to make mealtime more mindful, personalized, and enjoyable.

The application is designed to suggest food items based on the user's current emotional state. Whether someone is feeling joyful, stressed, lonely, or excited, the app recommends meals that are best suited to either elevate that mood or provide comfort. For instance, someone who is anxious might be recommended soothing foods like herbal tea or light soups, while a happy user may see suggestions for celebratory treats like ice cream or pizza.

To enhance trust and engagement, each food suggestion is paired with a relevant YouTube review link, allowing users to watch how the food looks, is prepared, or is enjoyed by others. This helps them make more informed and satisfying choices.

Built entirely using Kotlin, *MoodToMeal* leverages Android's native development capabilities for optimal performance, smooth user experience, and elegant UI. With its combination of mood-based intelligence and multimedia content.

1.2 OBJECTIVE

The main objective of the *MoodToMeal* application is to create a smart, user-friendly Android platform that bridges the gap between emotional well-being and food preferences. Developed entirely in Kotlin, the app focuses on analyzing or selecting the user's current mood and suggesting suitable food items that resonate with or help improve that emotional state.

In today's world, food is more than just nourishment—it's comfort, celebration, therapy, and even a reflection of how one feels. *MoodToMeal* taps into this emotional-food connection to make mealtime decisions more conscious and enjoyable. The app allows users to either select their mood from predefined categories or input a short sentence describing how they feel. Based on the identified mood, the system recommends a list of relevant dishes tailored to uplift, comfort, or match the emotional tone of the user.

To make food selection more engaging and trustworthy, each suggestion is accompanied by a YouTube video review link, enabling users to explore how the dish is made, what it looks like, and how others have enjoyed it. This multimedia integration adds value and credibility to the recommendations.

1.3 EXISTING SYSTEM

Popular food delivery and recipe apps suggest meals based on trends, ratings, or time of day, but they often ignore how a person is feeling at the moment. While some wellness apps focus on mood tracking, and food apps focus on discovery, there is a noticeable gap in combining emotional intelligence with food recommendations. *MoodToMeal* addresses this gap by introducing mood-driven suggestions, offering a more personalized and fulfilling experience.

CHAPTER 2

LITERATURE SURVEY

[1] Hierarchical Attention Network for Visually-aware Food Recommendation:

This study introduces a neural network model that integrates user history, recipe ingredients, and images to enhance food recommendation accuracy.

[2]A Survey on Aspect-Based Sentiment Analysis: Tasks, Methods, and Challenges: This survey provides an overview of aspect-based sentiment analysis, discussing tasks, methods, and challenges, which is pertinent to understanding user sentiments in food reviews.

[3]Sentiment Analysis of Customer Reviews of Food Delivery Services Using Deep Learning and Explainable Artificial Intelligence: Systematic Review:

This systematic review examines the application of deep learning and explainable AI in analyzing customer sentiments towards food delivery services.

[4] Sentiment Classification of Food Reviews:

This research focuses on predicting the sentiment scores of food reviews using recurrent neural networks, addressing challenges like data skewness.

[5]Deep Learning-based Sentiment Classification: A Comparative Survey: This comparative survey evaluates over 100 deep learning-based sentiment classification approaches across various domains, including food, highlighting factors affecting their performance.

[6] Smart Campus Food Ordering and Recommendation System with Emotion Booster: A First Design:

This study proposes a system that detects users' moods via facial expressions to recommend food items aimed at improving their emotional state.

[7] An Approach to Integrating Sentiment Analysis into Recommender Systems:
This paper discusses the integration of sentiment analysis with recommender systems, utilizing deep learning models to enhance recommendation accuracy.

[8] A Hybrid Food Recommendation System Based on MOEA/D Focusing on the Problem of Food Nutritional Balance and Symmetry:
This research presents a hybrid food recommendation model that considers nutritional balance using a multi-objective evolutionary algorithm.

[9] Human Behavior-based Personalized Meal Recommendation and Menu Planning Social System:
This study introduces a framework that uses EEG signals to recognize human affects towards food, facilitating personalized meal recommendations and menu planning.

[10] Health-Aware Food Recommendation Based on Knowledge Graph and Multi-Task Learning:
This paper proposes a food recommendation system that utilizes knowledge graphs and multi-task learning to provide health-aware suggestions.

[11] EMOQ-Emotion Based Food Recommendations System: This research aims to build an emotion-based food recommendation system that senses users' core emotions to provide appropriate food suggestions.

[12] Health-aware food recommendation system with dual attention in heterogeneous graphs:
This study presents a health-aware food recommendation framework employing dual attention mechanisms in heterogeneous graphs to enhance unsupervised learning.

[13] A Sentiment Analysis Approach for Exploring Customer Reviews of Online Food Delivery Services:

A Greek Case: This paper explores sentiment analysis techniques applied to customer reviews of online food delivery services, focusing on the Greek market.

[14] A systematic review on food recommender systems:

This systematic review summarizes the current state-of-the-art in food recommender systems, discussing methods, data processing, and evaluation techniques.

[15] Modeling of Recommendation System Based on Emotional Information and Collaborative Filtering:

This research proposes a recommendation system that integrates emotional information with collaborative filtering to enhance user satisfaction

[16] Emotion-Aware Music Recommendation System: Enhancing User Experience Through Real-Time Emotional Context:

Although focused on music, this study addresses the incorporation of real-time emotional context into recommendation systems, offering insights applicable to food recommendations.

[17] Aspect-Based Sentiment Analysis of Restaurant Reviews:

This paper examines aspect-based sentiment analysis techniques applied to restaurant reviews, providing insights into customer opinions on various aspects of dining experiences .

[18] Nutritional Meal Recommender System Using Machine Learning Algorithms:

This study develops a meal recommender system that considers users' nutritional requirements and preferences, employing machine learning algorithms for personalized suggestions.

[19] Context-Aware Food Recommendation System for Smart Health Applications:

This research introduces a context-aware food recommendation system that integrates user context, such as health conditions and activity levels, to provide tailored dietary suggestions.

[20]Personalized Food Recommendation System for Patients with Chronic Diseases Using Ontology and SWRL:

This paper presents a personalized food recommendation system designed for patients with chronic diseases, utilizing ontology and Semantic Web Rule Language to ensure health-compliant suggestions.

CHAPTER 3
PROPOSED SYSTEM

3.1 GENERAL

The MoodToMeal app, built using Kotlin, offers personalized food recommendations based on the user's mood. Users input their emotional state, selecting from predefined moods like happy, sad, tired, or stressed. Based on this input, the app suggests meals that align with or improve the user's emotional state—comfort foods for sadness, energizing meals for fatigue, or light dishes for stress. Additionally, each suggestion is paired with a YouTube review link, helping users explore the dish further before making a choice.

The system also adapts over time, learning from user feedback and preferences to offer even more accurate suggestions. By understanding the connection between emotions and food, MoodToMeal not only provides meal ideas but also helps users develop healthier eating habits that support emotional well-being. The app also includes nutritional information for each dish, ensuring that food choices are both emotionally and physically satisfying. The interface is designed to be simple, intuitive, and easy to use, ensuring a seamless experience for all users.

This system aims to transform the way users approach food by promoting mindfulness in food choices, making each meal a positive and emotionally fulfilling experience.

3.2 SYSTEM ARCHITECTURE DIAGRAM

The architecture of the **MoodToMeal** app is designed to convert the user's emotional input into personalized food recommendations using a modular approach. The process begins with the **User Input**, where users select or enter their current mood. This input is sent to the **Mood Analyzer**, which identifies the emotion and classifies it into predefined categories such as happy, sad, tired, or stressed. Each category then directs the system to specific types of meals that are emotionally supportive—comforting meals for sadness, energizing meals for tiredness, and so on. This classification ensures that the food suggested aligns with or helps improve the user's current state of mind.

Once the emotion is recognized, the system's **Meal Suggestion Engine** presents suitable food items and simultaneously fetches relevant **YouTube review videos**, allowing users to explore the meals visually and make informed decisions. The chosen meal and user actions are then recorded in the **Feedback Storage**, creating a continuous feedback loop that helps the system learn the user's preferences over time. This loop enhances personalization with every interaction. Overall, the architecture ensures a user-friendly, emotion-driven food discovery journey powered by smart data flow and Kotlin-based implementation.

Based on the identified mood, the **Meal Suggestion Engine** recommends meals tailored to that emotional state, aiming to enhance or balance the user's feelings. To make the suggestions more engaging, the app also fetches relevant **YouTube review videos**, allowing users to visualize and learn more about the recommended dishes. After the user makes a selection, their choice is stored in the **Feedback Module**, enabling the system to refine future suggestions based on individual preferences. This smart feedback loop, combined with a simple Kotlin-based implementation and a clean user interface, ensures a personalized and emotionally mindful food recommendation experience.

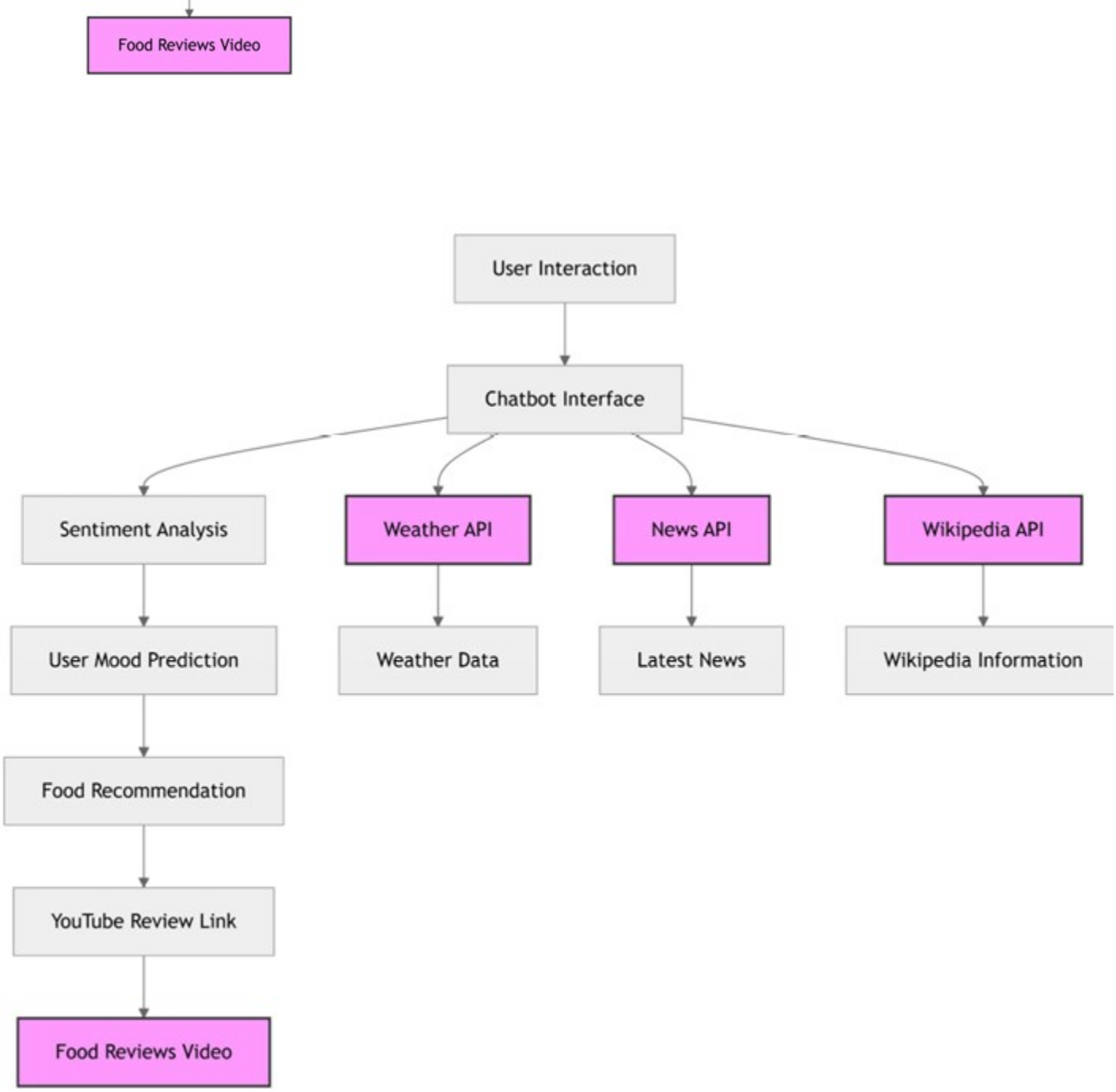


Fig 3.1: System Architecture

3.3 DEVELOPMENTAL ENVIRONMENT

3.3.1 HARDWARE REQUIREMENTS

The MoodToMeal application requires an Android smartphone with a minimum of 2GB RAM and 1.5 GHz quad-core processor for smooth performance.
A touchscreen display with at least 5 inches is recommended for better user experience.
The device must support Android 8.0 (Oreo) or higher.
An active internet connection is essential to fetch YouTube review videos'

- **Android smartphone with minimum 2GB RAM**
- **1.5 GHz quad-core processor or higher**
- **5-inch or larger touchscreen display**
- **Minimum 16GB internal storage**
- **Active internet connection (Wi-Fi or mobile data)**

3.3.2 SOFTWARE REQUIREMENTS

The MoodToMeal app was developed using **Kotlin** within **Android Studio** as the primary IDE.
It requires the **Android SDK (API level 26 or above)** for compatibility.
The project uses **YouTube Data API** for fetching video reviews.
Gradle is used for build automation and managing dependencies.

- **Android Studio (latest stable version)**
- **Kotlin programming language support**
- **Android SDK version 26 (Oreo) or above**
- **YouTube Data API integration**
- **Gradle build system for dependency management**
- **Emulator or physical device for testing**

3.4 DESIGN OF THE ENTIRE SYSTEM

3.4.1 ACTIVITY DIAGRAM

The activity diagram Fig 3.2 outlines the basic structure of the chatbot system. The interaction begins when the user starts chatting with the chatbot. Based on the user's input, the system fetches relevant data using APIs such as Weather, News, or Wikipedia. The results are then displayed to the user. After the conversation ends, sentiment analysis is performed on the entire chat to determine the user's mood. Based on the detected mood, the system recommends a suitable food item and provides a related YouTube review link. The process then concludes, delivering a personalized and engaging user experience.

Fig 3.2: Activity Diagram

3.4.2 DATA FLOW DIAGRAM

The data flow diagram Fig 3.3 outlines the process of detecting fake profiles using a machine learning model integrated with blockchain security via a Flask framework. It begins with the dataset, containing raw data on social media profiles, which undergoes preprocessing to handle missing values, remove outliers, and extract relevant features. The preprocessed data is split into training data (80%) for model training and testing data (20%)* for evaluation. The training phase utilizes machine learning algorithms like Support Vector Machines, Gradient Boosting, or Random Forest. Once trained, the model is deployed with blockchain security and Flask framework for secure, scalable, and tamper-proof operations. The testing phase assesses the model's accuracy, and the system ultimately classifies profiles as either

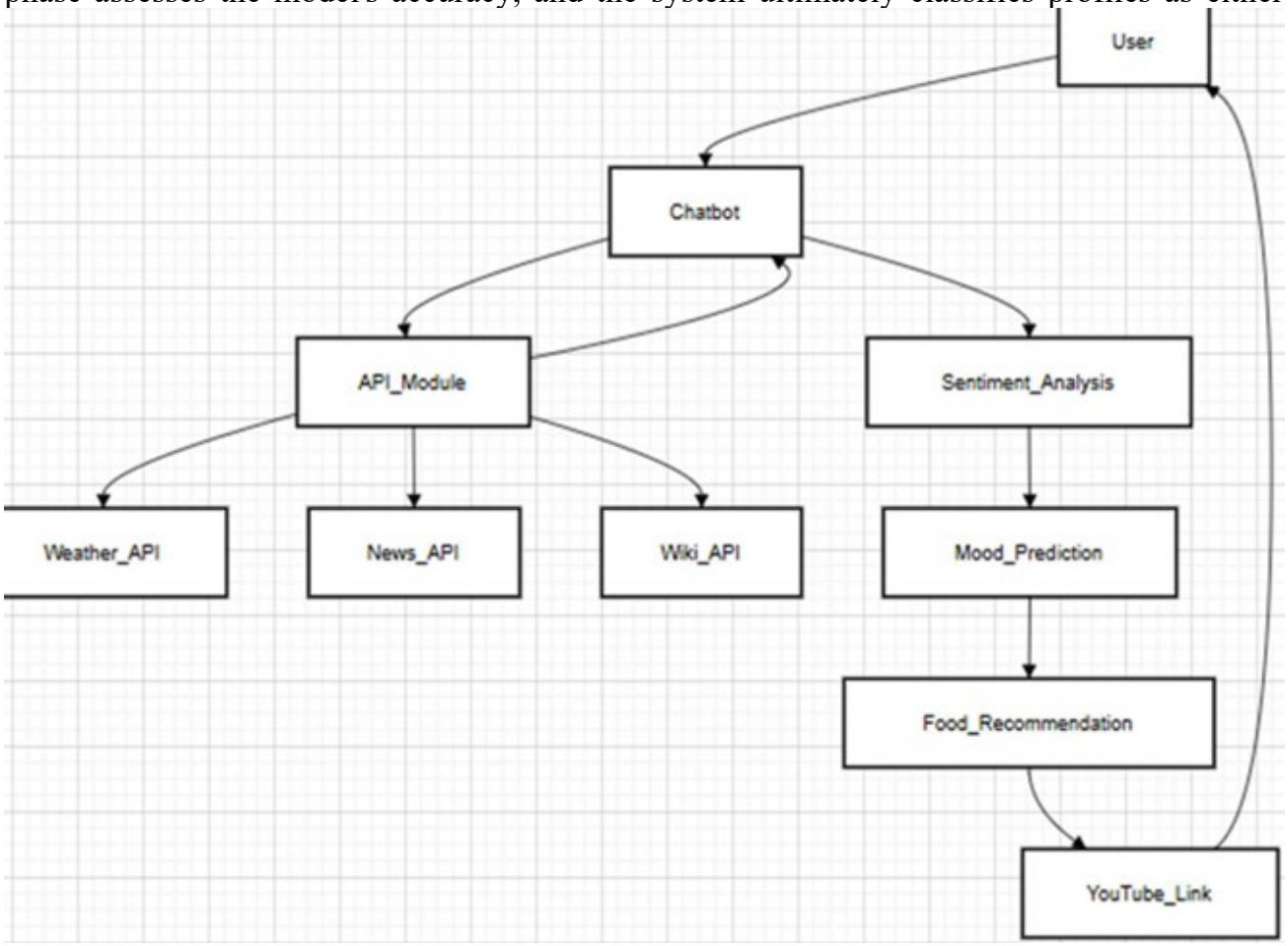


Fig 3.3:Data Flow Diagram

3.5 STATISTICAL ANALYSIS

In the **MoodToMeal** application, statistical analysis plays a key role in improving the personalized meal recommendations over time. The app collects data from user inputs, mood categories, meal preferences, and feedback to analyze patterns and enhance the recommendation engine.

Some key statistical methods that can be used in the analysis include:

1. **Frequency Analysis:** Tracks the most common moods and meal choices across users to determine the most popular meals for each mood category. This helps in refining the meal suggestions.
2. **User Behavior Analysis:** By analyzing the user's historical selections and feedback, the app can predict preferences and suggest meals accordingly. This data-driven approach allows for real-time learning and improvement.
3. **Cluster Analysis:** Groups users based on similar mood and meal preference patterns, enabling more personalized recommendations. For example, users with similar emotional profiles can be served meals tailored to that emotional group.
4. **Sentiment Analysis:** If the app gathers textual feedback, sentiment analysis could be applied to gauge the user's satisfaction and emotional reaction to the meal suggestions, adjusting the system based on positive or negative responses.
5. **A/B Testing:** The app can perform A/B tests to determine which meal recommendations or YouTube review links lead to higher user engagement and satisfaction

CHAPTER 4

MODULE DESCRIPTION

The **MoodToMeal** application is built using a modular approach to ensure scalability, maintainability, and ease of development. Each module is designed to handle specific tasks, making the system flexible and easily upgradable. The core modules include:

4.1 SYSTEM ARCHITECTURE

4.1.1 USER INTERFACE DESIGN

The **MoodToMeal** app allows users to input their mood, which is analyzed to suggest personalized meals. Relevant YouTube review links are displayed alongside the meal suggestions for further exploration. Users can select a meal, and the app shows detailed information and videos. This provides an engaging and emotionally tailored experience.

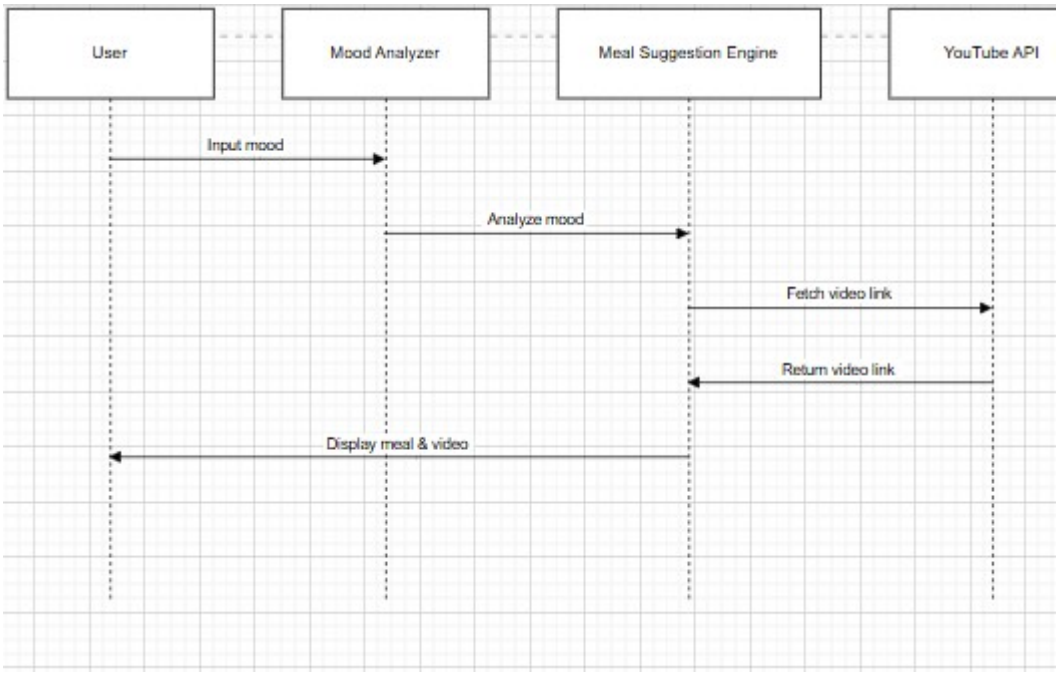


Fig 4.1 sequence diagram

4.1.2 BACK END INFRASTRUCTURE

The MoodToMeal application leverages a cloud-based backend infrastructure to ensure scalability, reliability, and efficient integration with external services like the YouTube Data API. By utilizing cloud platforms such as Google App Engine or Firebase, the application benefits from managed services that handle server provisioning, load balancing, and scaling based on demand. This setup allows for seamless management of user data, meal recommendations, and feedback storage, all while maintaining high availability and performance.

4.2 DATA COLLECTION AND PREPROCESSING

4.2.1Dataset and Data Entry

In the MoodToMeal application, the dataset comprises user interactions, including mood inputs, meal preferences, and feedback. Data entry occurs through the app's user interface, where users select their current mood and choose from personalized meal suggestions.

4.2.2. Data Preprocessing

Data preprocessing involves:

Data cleaning and Normalization

4.2.3 Feature Selection

Key data features selected for processing include:

Mood Based Selection

User Interaction

Personalized feedback integration

4.2.4 Classification and Model Selection

In the **MoodToMeal** application, user moods are classified using machine learning algorithms like Support Vector Machines (SVM) and K-Nearest Neighbors (KNN). Model selection involves evaluating these classifiers based on performance metrics such as accuracy and precision to determine the most effective algorithm for mood prediction.

4.2.5 Performance Evaluation and Optimization

The system is optimized based on:
Optimizing data retrieval
and enhancing user feedback mechanisms.

4.2.6 App Deployment

Application deployment involves installing, configuring, and enabling software applications for end-users. This process ensures that applications are correctly placed within specific environments and are ready for use. Efficient deployment is crucial for delivering functional software that meets user needs and expectations.

4.3 SYSTEM WORK FLOW

4.3.1 User Interaction:

user interactions are integral to the system workflow, enabling users to input mood data and receive personalized meal recommendations. The system captures these interactions, processes the information, and provides tailored suggestions, ensuring a responsive and user-centric experience.

4.3.2 User Profile Management:

Users input personal information, including mood, dietary preferences, and health goals, to create a tailored experience.

4.3.3 Mood Assessment:

The system captures and analyzes user moods through questionnaires or mood-tracking features to understand current emotional states.

4.3. Meal Selection and Customization:

Users browse suggested meals, with options to customize ingredients or preparation methods to suit individual tastes.

4.3.5 Suggesting Youtube Food review link:

Based on the mood the app suggests the users the food and also provide the youtube review link for the particular food item .

CHAPTER 5

IMPLEMENTATION AND RESULTS

5.1 IMPLEMENATION

The MoodToMeal project is a Kotlin-based application that suggests food recommendations based on the user's current mood. The app uses a simple mood input interface, where users can select their mood (e.g., happy, sad, stressed, etc.) through predefined options or by typing keywords. Based on this mood input, the app queries a database or an API to retrieve a list of food suggestions that align with the selected mood. Along with the food suggestions, the app provides YouTube review links for each dish, allowing users to watch relevant videos for more context and preparation tips. The system's backend is designed to match mood keywords to food categories, ensuring personalized recommendations. The UI is designed to be intuitive, with minimalistic navigation, allowing users to easily select their mood and view the suggested meals with corresponding YouTube links

5.2 OUTPUT SCREENSHOTS

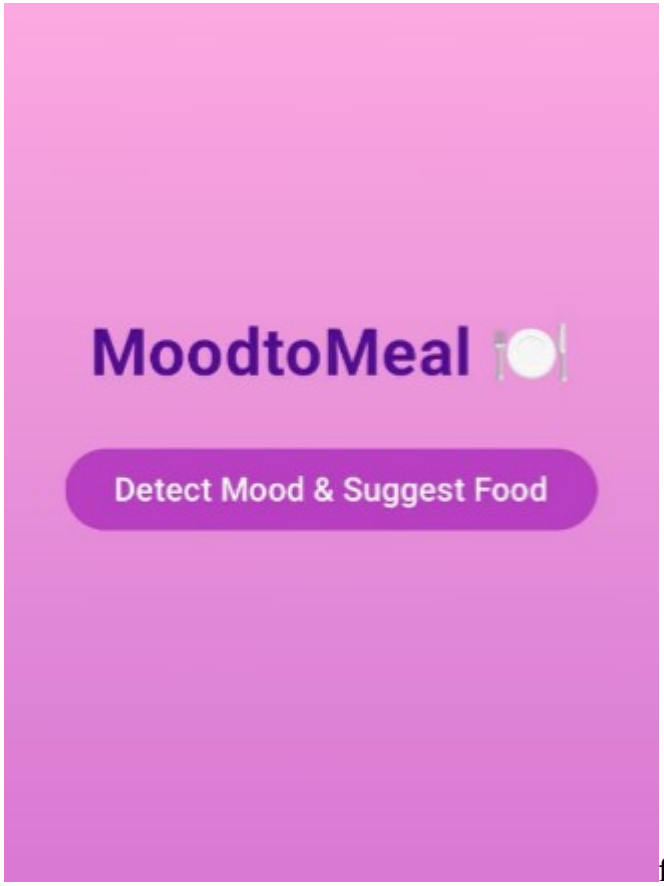


fig 5.1 home page

The home page of the app where users can choose their current mood. This can be represented by a clean, simple UI with mood options (Happy, Sad, Stressed, etc.) as clickable buttons.

The **Home Page** of MoodToMeal allows users to easily input their mood by selecting from a list of predefined emotions. The mood options are presented as simple, visually appealing buttons that users can tap to indicate how they're feeling. Upon selecting a mood, the app fetches relevant meal suggestions that match the user's emotional state. The page also includes a subtle animation to make the app feel more interactive and engaging.

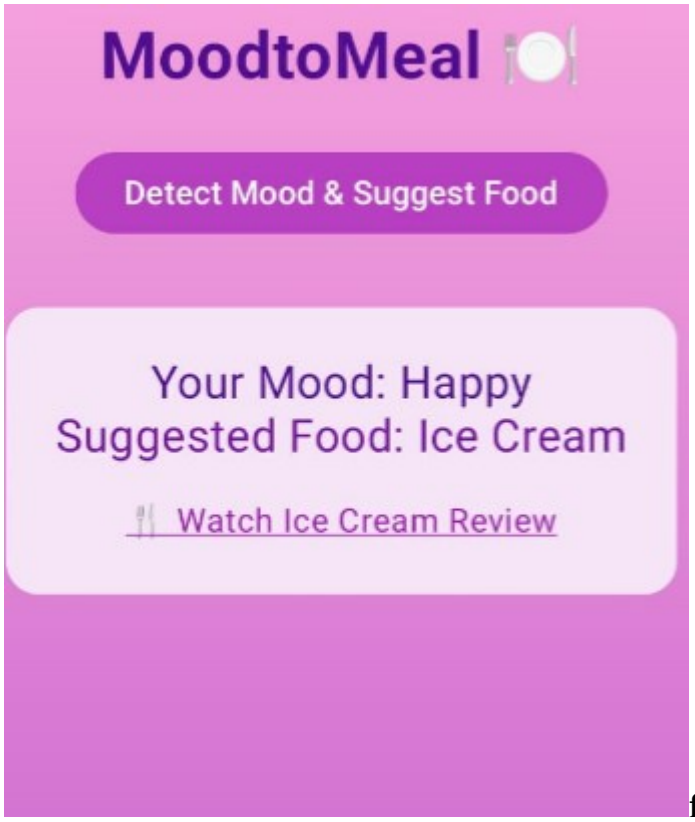


fig 5.2 suggesting food based on mood

The meal suggestion results page, showing a list of food items aligned with the selected mood, with each food item linked to a YouTube review video.

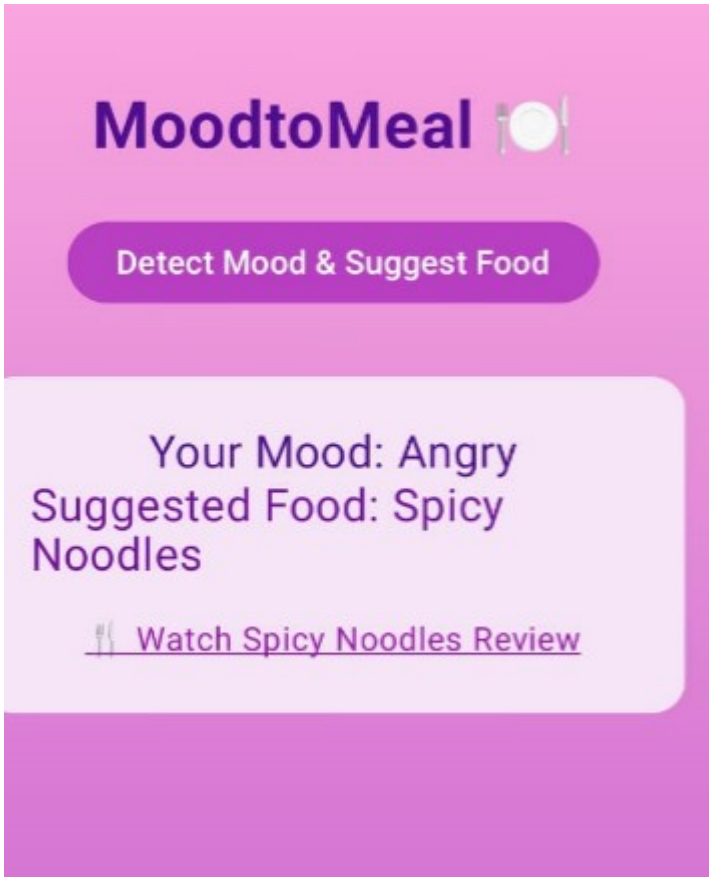
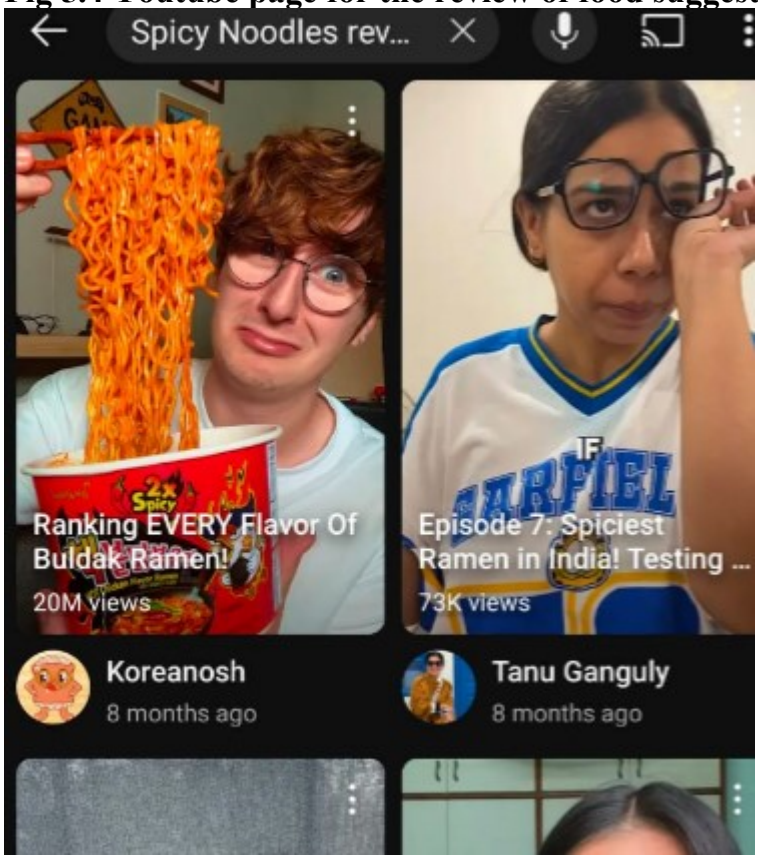


Fig 5.3 suggesting food based on the mood

Fig 5.4 Youtube page for the review of food suggested



The Meal Suggestions Page is where the core of the MoodToMeal app comes to life, offering users tailored food recommendations based on their mood. Each food item is presented with an appealing thumbnail image of the dish, giving users a visual preview. Beneath each thumbnail, an embedded YouTube review link allows users to instantly tap and watch a detailed cooking tutorial or review, all within the app through an integrated web view. This ensures a smooth user experience without needing to leave the app. Alongside the video link, each dish is accompanied by important details such as preparation time, ingredients, and cooking tips. The preparation time gives users a clear idea of how long the recipe will take, while the ingredient list ensures they are ready with everything they need. The cooking tips section offers helpful advice on perfecting the dish, such as temperature control or ingredient substitutions. The layout of this page is clean and intuitive, with food items displayed in a scrollable list format, making it easy for users to find and explore meals that match their mood, while seamlessly integrating useful content and video reviews. This feature transforms the app into not only a mood-based food recommendation system but also a dynamic cooking resource for users seeking inspiration and practical advice.

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT

6.1 CONCLUSION

The MoodToMeal project effectively combines the user's emotional state with personalized food recommendations, creating a unique and engaging experience that caters to the intersection of mood and culinary preferences. By leveraging Kotlin, the app enables users to effortlessly select their mood and receive meal suggestions tailored to their emotional needs. This personalized approach is not only a fun way to discover new foods but also provides an emotional connection to the act of eating. The integration of YouTube review links for each dish further enhances the user experience by offering a convenient way to access cooking tutorials, reviews, and tips. The embedded YouTube videos provide users with valuable insights into meal preparation, making cooking an enjoyable and educational experience. Additionally, the app goes beyond simply suggesting food; it offers practical and detailed information, such as preparation times, ingredients, and cooking tips, ensuring that users are well-equipped to recreate the dishes at home. The intuitive, user-friendly design of the app ensures that even those who are new to cooking or those in need of a quick, comforting meal can find something suitable. Through its combination of mood-based food recommendations, YouTube video integration, and additional cooking resources, MoodToMeal stands out as an innovative platform that offers more than just meal suggestions—it creates a holistic, enjoyable, and educational food experience that is both accessible and personalized. The project exemplifies how technology can merge with daily life to improve user well-being, making it not only a useful tool for meal planning but also a creative solution that connects emotional well-being with the joy of cooking. This makes MoodToMeal a truly valuable application that goes beyond the typical recipe suggestion platforms, offering a deeper, more personalized connection to food.

6.2 FUTURE ENHANCEMENT

AI-Powered Mood Detection: Instead of relying solely on user input, the app could incorporate AI and natural language processing (NLP) to detect the user's mood based on their text input, voice tone, or even facial recognition (using the phone's camera). This would make the mood selection process even more seamless and personalized, as the app could automatically suggest food based on the detected emotional state without requiring the user to manually select their mood.

Integration with Smart Kitchen Devices: By integrating the app with smart kitchen appliances (e.g., smart ovens, refrigerators, or cooktops), the app could suggest recipes based on available ingredients in the user's kitchen. Users could input what ingredients they have, and the app could recommend meals that can be made with those ingredients, streamlining the cooking process.

Customizable Mood Profiles: Users could create custom mood profiles where they can specify not only their mood but also food preferences (e.g., vegetarian, gluten-free, spicy, etc.). This would allow for even more tailored food suggestions, ensuring that users receive recommendations that match both their emotional state and dietary needs.

Social Integration and Sharing: The app could allow users to share their meal experiences with friends or on social media. For instance, users could take photos of the meals they've cooked, share YouTube review links, or even post their mood and meal pairing recommendations. This feature would add a social component to the app, making it more interactive and community-oriented.

Meal Planning and Grocery List: An enhanced feature could allow users to plan their meals for the week based on their moods and create a grocery shopping list directly from the

app. The app could suggest meals for multiple days, allowing users to easily plan their meals and purchase ingredients in bulk, saving time and effort.

Nutritional Information and Health Integration: Future versions of the app could include a focus on health and nutrition, offering information about the nutritional content of each dish. It could also integrate with health apps (such as Google Fit or Apple Health) to track calories, nutrients, and other dietary goals based on the meals users select, providing a more holistic approach to food selection.

Real-Time User Feedback and Rating System: After users try a recommended recipe, they could provide feedback or rate the meal, which would help improve the app's future suggestions. The app could then learn from user preferences and refine its meal suggestions to become even more accurate over time.

Collaborations with Chefs and Food Influencers: Collaborating with professional chefs or food influencers to create exclusive content within the app could elevate its appeal. Users could watch special cooking shows, participate in live cooking classes, or follow tutorials from renowned chefs, which would enhance both the educational and entertainment aspects of the app.

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