

Menutopia - Multipanel Restaurant-User Full-Stack Smart Mobile Application

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Abstract:- Developed and published an iOS mobile application on the App Store named Menutopia, as a part of my Research Internship project in a company named Bazan LLC, United States. This app helps local restaurants and customers stay connected on a common platform — get to know the availability of nearby restaurants, surf various restaurants and cuisines, order favourite food and at the same time, discover new friends and get connected, surf your friends' feed, and many more. The primary idea of this app is to enable the users to consume what they want and where they want. It is the best, most convenient and free way to get your favourite food from restaurants. With this app, one can easily find restaurants and order favourite food and get connected with friends and other stakeholders of the restaurant. Download the Menutopia app on the App Store to experience the best restaurant-user platform and to enrich a quality service to users.

Keywords:- Iphone; Xcode, Swift, Firebase, Api, GPS, Sketch.

I. INTRODUCTION

The mobile applications are moving into every aspect of our day-to-day lives. With the advancement of iPhones, the iOS applications became an important aspect for local and global connectivity. This application Menutopia, acts as a handy interface between restaurants and users. It is a Menu-photo sharing app for both Restaurants and Users to help them come together with the power of social media platform. It is dedicated to assist users to find their favourite grub or restaurant while creating a platform for local restaurants to advertise their menus to the users. All the local restaurants in a specific geographical location will be sharing their entire menu with colourful pictures, descriptions, prices, and category tags like meal type, food genre, cuisine, etc. Users will be able to use the Menu feed to discover local food stuff and their posts, and will be able to share their posts and experiences to their friends and followers to the separate User feed. Users can get to know the reviews through the number of likes on a specific grub item. Users can simply search the keyword of the meal name or any tag name related to the ingredients, type, genre or cuisine if they don't remember the name of the food. Discover other restaurants to know what they are up to and discover other users, make friends, share posts and get to follow them to see their posts. This user friendly multi-panel application on a social media platform, gives a hassle-free user experience to the customers.

II. MENU TOPIA APP

A. Account Creation

First, the users can choose the type of account which they intend to be registered as, in the app. (i) On the restaurant panel account, the restaurant shall provide all its details, contact information, open hours and the address using GPS (Global Positioning System) on Apple Maps. Upon secured authentication, its restaurant account is successfully created and the restaurants will be able to post their menu. (ii) On the user panel account, the users shall provide their personal details and a short bio about them. Again upon secure authentication, the user's account is successfully created and the users will be able to discover restaurants and other users.

B. Surfing Menu Feed

Users can find a restaurant and its menu by picking a specific geographic location on the Maps using the Navigation and GPS and indicating a specific radius range, as depicted in Figure 3. Now, the users will be able to see the whole bunch of restaurants and their menu items available from this selected location. For the time being, the Menu feed is subjected to the Indiana state, United States. The Menu feed, with its beautiful user interface, gives a detailed overview on the (i) Restaurants — the distance from the current location, open or closed status, address, and (ii) Menu items — provides menu item name, description, pictures, price, category tags like meal type, food genre, cuisine, and the number of likes, as depicted in Figure 4.

C. Customised Menu Feed

The Menu feed offers few customised standalone features. (i) On clicking the restaurant's name in a specific menu cell, the user can visit its individual restaurant profile and get a wholesome look at the detailed list of its menu items, check its address, contact information and open or closed status. (ii) On clicking any specific label tag in any menu cell, the user can get the list of available menu items from that food type or genre or cuisine, throughout all the restaurants. (iii) If the user chooses for a specific menu item, it could be simply searched using the keyword of the meal name or the ingredients or any tag name related to the food type, genre or cuisine, on the global search feature, as depicted in Figure 4.

D. Post & User Feed

(i) On the restaurant panel, one can post a menu item by filling in its details like — meal name, description, add pictures and price, select what categories it comes under, like

food type, genre or cuisine, as depicted in Figure 4. When clicked on Submit, the meal item will be successfully registered in the records and will be posted in the global Menu feed. (ii) On the user panel, one can post their social posts or memories or favourite food by taking pictures and adding a caption to it. When clicked on Share, the post will be successfully posted in the User feed and your friends will be able to see and give a like to it.

E. Discover Restaurants & Users

On the Discover tab, users will be able to see the entire list of restaurants that got signed up into the application. The users can contact the restaurant via call from here and can also visit a specific restaurant’s profile and get the detailed

information on it’s menu items. Also, the users will be able to see other users and their friends who got registered in the application. They can follow each other and see their posts. The users can even make use of the global search functionality on the Discover tab.

F. Profile

On the Profile tab, the restaurants or the users will be able to see their posts what they have posted and can see the number of likes on each of their posts. The restaurants can also edit their profile information and the open or closed status of the restaurant. The users will get a social media platform experience on Menutopia, interacting with 2 panels — restaurants and users, on the application.

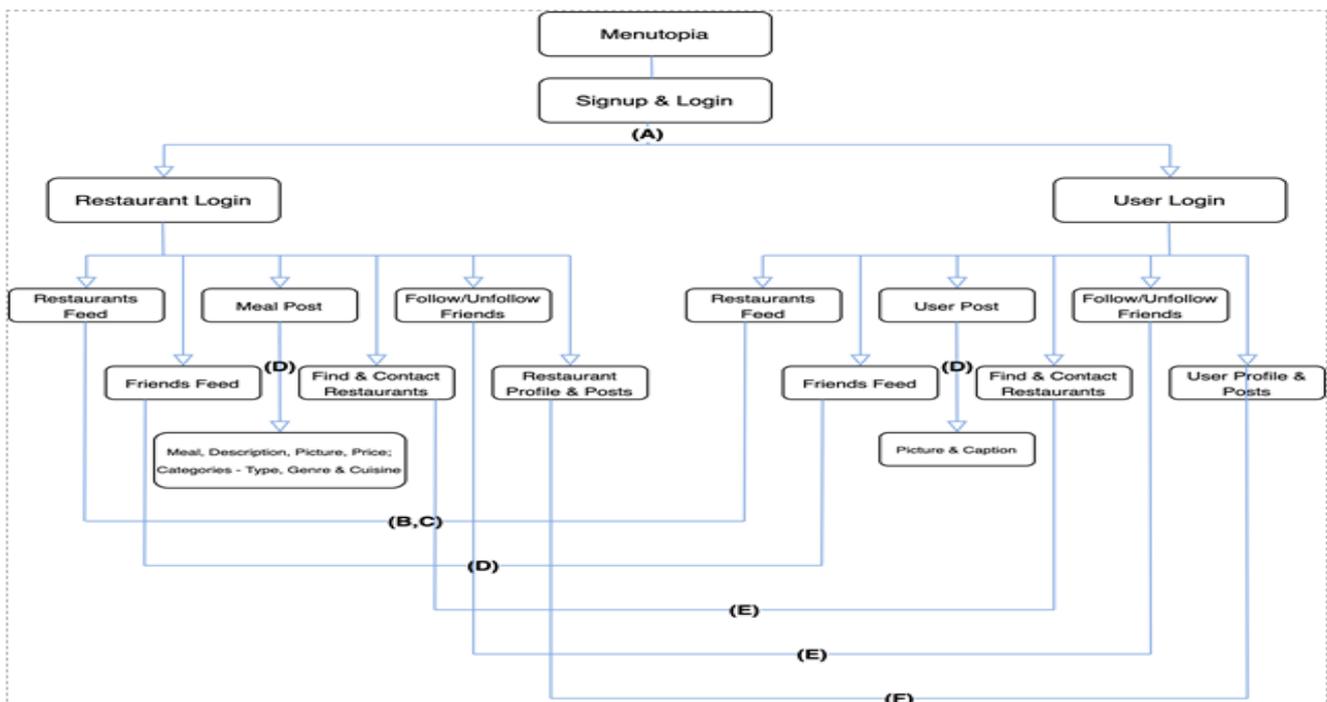
III. ARCHITECTURAL DESIGN

The iOS application Menutopia, is compatible and can be installed on all iPhones with operating system iOS 11.0 or above. The application is developed and built on Xcode (Xcode 12.0), Apple’s integrated development environment for Apple apps. The application is programmed in Swift (Swift 5.0) and Objective-C, Apple’s native platform programming languages.

The Backend server used for this application is Firebase (Firebase 7.0) — tools like Firebase Auth for Signup and Login authentication on the app, Firebase Database for storing the raw data and records of users on the app in json format, Firebase Storage for storing all the media files and images what users post on the app, and Firebase Analytics to keep a track on the users app usage and database usage. The application’s user interface is designed on Sketch (Sketch 60), the UI-UX vector graphics editor for iOS and macOS.



[Fig. 1. The Menutopia App]



[Fig. 2. Architectural Diagram of the App]

IV. FIREBASE SERVER

During Account Creation, Firebase Auth creates a unique ‘Identifier’ taking the user’s email id and other credentials. It generates a secured and encrypted ‘User UID’ for individual users, when the user creates an account in the app. Firebase Auth also keeps a track on the users logged in status — provides stats like, timestamp of the user account created, last logout/login status of the user, etc. Each time a user logs into the app, Firebase Auth verifies the ‘User UID’ of the user and approves the request to log in successfully.

In the Menu feed and User feed, the posts are fetched from the Backend server Firebase Real-Time Database. In Firebase Database, the data is stored in json format. All the nodes and the data is secured with encrypted ids at every single level of the json tree. The media files and images are stored in Firebase Storage in their respective posts folders. Each media file has a unique identifier name called an octet stream. The upload date and size of the media file is indicated corresponding to the image, in Firebase Storage. Firebase Storage generates a url for each and every media file that is uploaded and stores the url in Firebase Database.

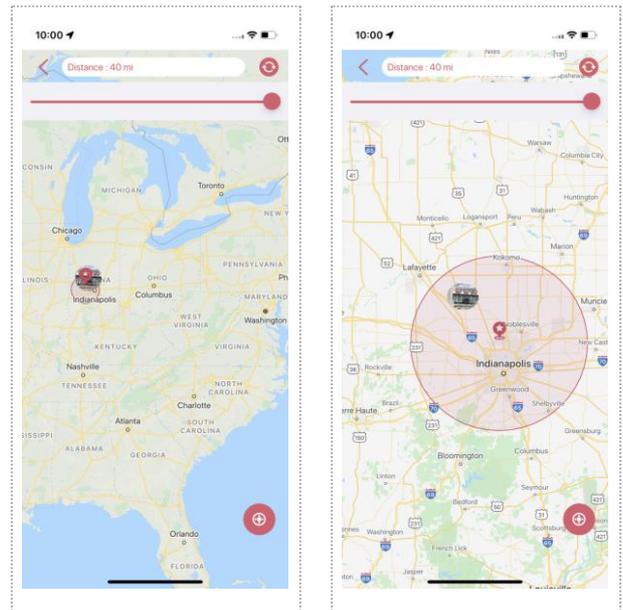
Firebase is integrated with the iOS app on Xcode using Cocoapods libraries. Firebase pods are installed using commands on the Mac Terminal using homebrew and ruby. On following the set of instructions what Firebase provided for it’s integration with iOS apps in it’s documentation, the pod file will be initialised. On adding the pod commands for Firebase in the pod file and installing the pods on the Terminal, we can make use of all the Firebase functionalities in the iOS app.

Further in the iOS app, custom Firebase Apis, using MVC (Model-View-Class architecture) and Swift-Firebase algorithms, have been developed for post and feed functionalities in the application. This makes the application smooth and responsive with a better performance.

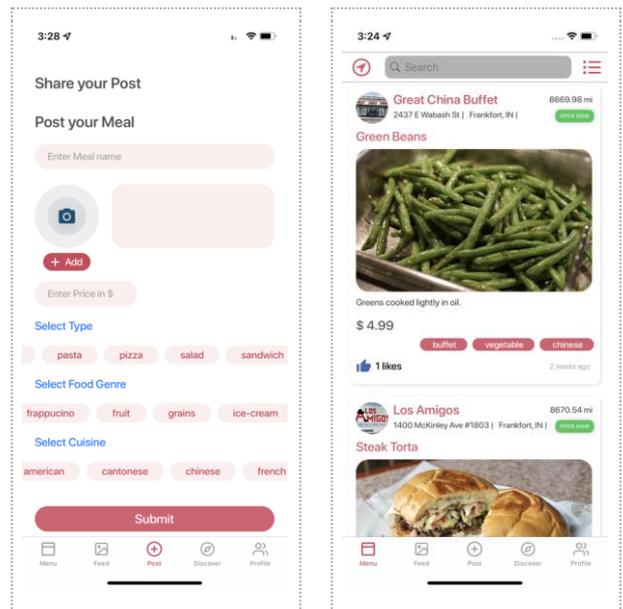
V. SPECIFICATIONS

- Swift & Objective-C languages.
- UIKit & Storyboarding for Frontend.
- Xib cells for custom views.
- Swift delegates for version control.
- Custom Swift Extensions.
- Geolocation for app’s GPS tracking.
- Firebase & Custom Apis for Backend.
- Custom class Models.
- Firebase Auth for Auth Service class & User Api.
- Firebase Database for Post Apis & Feed.
- Firebase Storage for Helper Service classes.
- Swift-Firebase callback methods like childByAutoId(), childAdded(), and child.observeSingleEvent() for Writing & Reading data and for Encrypting & Decrypting data on Firebase.
- MVC pattern programming to connect Frontend & Backend.
- Cocoapods for Swift libraries & packages.

- Sketch & Figma for app UI-UX design.
- Git, GitHub & App Store Connect.



[Fig. 3. Finding nearby restaurants using GPS]



[Fig. 4. Surfing Menu Feed & Post a Meal]

VI. CONCLUSION

Developed and published a multipanel restaurant-user full-stack mobile application Menutopia, which provides real time solution to connect restaurants and users on a common platform. This application provides the best user experience across all the iOS devices with better performance. Menutopia is a unique iOS app which is first of it’s kind in the App Store. Menutopia received a large user base and reviews on the App Store. This application enables the restaurants in enhancing sales performance.

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