FACULTY OF SCIENCE AND ENGINEERING
SEMESTER 2, 2018

IAB330 - Mobile App Design

Assignment 1: App Design

Due Date: Friday, August 24, 11:59 pm

Submission Method: Blackboard

Overview: You will submit a report that explains the benefits and feasibility of your mobile development project that will be executed throughout the semester. The report includes a survey of related applications, design decisions, and storyboards.

Submission Coversheet Declaration

You must sign below. By signing this form you agree to the following:

- We declare that all of the work submitted for this assignment is our own original work except for material that is explicitly referenced and for which we have permission, or which is freely available (and also referenced).
- We agree that QUT may archive this assignment for an indefinite period of time, and use it in the future for educational purposes including, but not limited to: as an example of previous work; as the basis for assignments, lectures or tutorials; for comparison when scanning for plagiarism, etc.
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The assignment should be completed in a team of 4 students. Please consult with your tutor and unit coordinator if you have any issues.

Chosen Project Name:		
Team Member Details		
Student Number	**Student Name**	**Signature**
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A - Background Research

Task 1: Project choice and executive summary of the chosen project

Concept

Foodradar is an app for rating and reviewing individual dishes at a given restaurant and will help the user decide which dish to order. This specific search is missing within the current app context, with many services providing overall restaurant reviews, but never ranking the individual meals. We aim to fill this niche, giving users more information so that they can more easily decide where and what to eat.

Required features and functionalities

The key features of Foodradar are the ability for users to:

- Search for nearby restaurants that sell a specific meal or type of food
- View ratings of both restaurants overall and individual meals on the menu, and submit their own ratings
- Filter search results by location range and price
- View nearby stores on a map

Target user group

Overarchingly, the target user group of Foodradar live in urban areas and own a mobile phone or other device. They are generally adolescent or older, making their own decisions about what/where to eat. More specifically, there are a few broad user groups which may be especially interested in using the Foodradar app, and who have specific demands and benefits of the service. These include:

Locals

- Looking for new/interesting food around their local area
- Looking for fun places to visit with friends or family
- May be searching for a store which sells an uncommon food they’ve heard off online or from friends

Students

- Often looking for affordable food
- May refine search to areas close to where they study
- May be interested in student discounts or other deals

Travellers

- Often looking for good local food, rather than global chains
- May or may not be price conscious
- May be interested in trying local specialty dish

Business Owners

- Looking to advertise their business and be discovered
- Interested in local competition
- Seeking customer feedback

Other existing apps

There are some similar apps existing in the current market, but none give as much fine detail as Foodradar aims to achieve. Services such as Yelp and TripAdvisor, which will be analysed further below, allow users to rate overall restaurants or locations, but not on specific items on the menu. As such, there is a gap identified in the current app landscape that Foodradar aims to fill.

Explain how your mobile app will fulfil user needs

Foodradar will make it easier for people to decide what to order when at a restaurant. Many people are indecisive when it comes to ordering food. Foodradar tries to make the most of your restaurant visit, enabling the user to choose their optimal dish. As Foodradar has all this data on individual dishes it will also implement a search through these dishes. The user will be able to search for reviews on specific meals, E.g. if the user wants a Carbonara dish they can get the top rated Carbonara dishes near them.

Task 2 – Background research and review of related mobile applications

Problem Space Presentation and Discussion

The main challenge FoodRadar will face is the gathering of data. The best approach would be to get restaurants to upload the menus by themselves to the app. That way the restaurant could have control over how up to date the menu is. FoodRadar could benefit the restaurants in many ways, e.g. giving them information on how they can improve each dish, how popular each dish is and comparison of similar dishes in similar restaurants.

Mobile Application Review

Oink (Ingraham, N. 2012)

Oink was an app from the developer Milk which had similar core concept to FoodRadar. Unfortunately, it was shut down after just five months (Roke, K. 2011). The developer abandoned the project to work on other ideas, leaving behind a number of users. This project is an excellent case study, as we will be able to learn from both their successes and failures in terms of UI and other aspects.

Positive:

- It provides a more detailed rating system than other apps.
- Newsfeed on friend’s ratings.

Negative:

- The applications scope was too large, allowing users to rate anything.
- Depends entirely on user input for data.

Conclusion:

- Oink had a clear problem with the scope of their application being too large. As all their data comes from user input the result is likely to be too chaotic and inaccurate.

TripAdvisor (TripAdvisor. 2018)

Android: https://play.google.com/store/apps/details?id=com.tripadvisor.tripadvisor&hl=en

Apple: https://itunes.apple.com/au/app/tripadvisor-hotels-restaurants/id284876795?mt=8

TripAdvisor has a reliable and popular rating system for restaurants. They are well established with a comprehensive database of restaurants. They have a wide range of filters, categories and dietary restrictions.

User Interface: The UI is really search driven with most screens revolving around search or recommendations. The navigation is simplistic with a persistent navbar at the bottom of the screen.

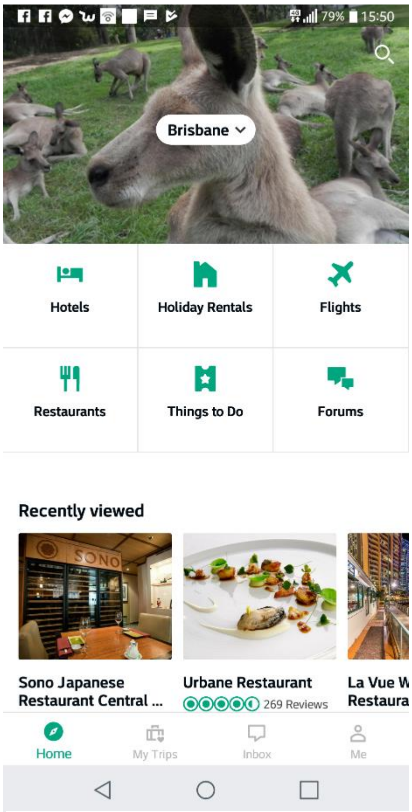
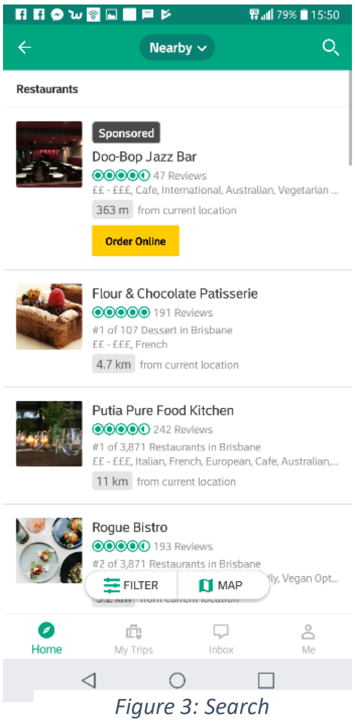


Figure 1: TripAdvisor Home Page

Home page: The homepage prominently displays the six categories of services that TripAdvisor reviews followed by horizontally scrollable lists of restaurants grouped up by categories. Everything presented here is filtered by some given location which defaults to the user's current location. This is a smart design decision made to minimize the number of clicks required on average as the app is mostly used to find immediate placed to go rather than for longer term planning.

Search page: The search is a familiar stack layout with 4 key elements: location, general search, comprehensive filters and a map. Some places have the option to order or reserve a table online that redirect users to the appropriate website. The filter options are extensive and intuitive to use. The map has pins representing each restaurant that fits the search filters. When a pin is selected a small box at the bottom of the screen shows its name and a short summary. The reviews tab gives a total number of reviews as well as a distribution breakdown. A great feature included is finding reviews that mention some keyword allowing for an ad-hoc way to see reviews for individual meals.

In conclusion TripAdvisor allows the user to search through the reviews, which FoodRadar will also implement. What FoodRadar will hold above TripAdvisor is the ability to read reviews and ratings for individual dishes.



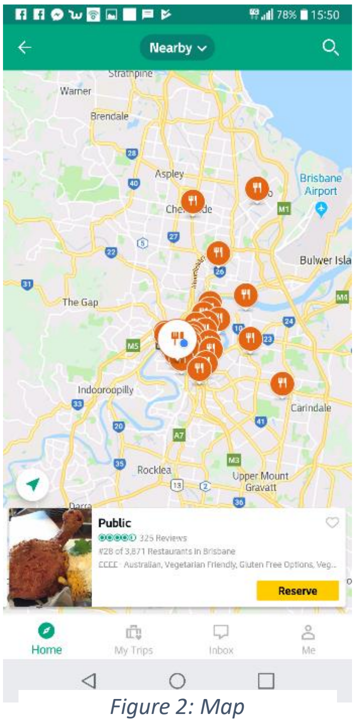
Doo-Bop Jazz Bar
47 Reviews
££ - £££, Cafe, International, Australian, Vegetarian ...
363 m from current location

Flour & Chocolate Patisserie
191 Reviews
#1 of 107 Dessert in Brisbane
££ - £££, French
4.7 km from current location

Putia Pure Food Kitchen
242 Reviews
#1 of 3,871 Restaurants in Brisbane
££ - £££, Italian, French, European, Cafe, Australian,...
11 km from current location

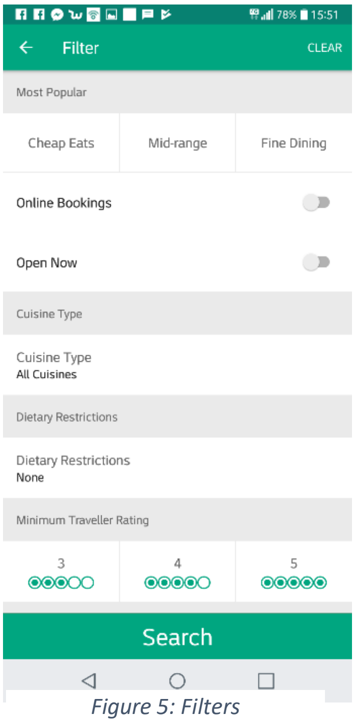
Rogue Bistro
193 Reviews
#2 of 3,871 Restaurants in Brisbane
...lly, Vegan Opt...

Figure 3: Search



Public
325 Reviews
#28 of 3,871 Restaurants in Brisbane
££££ · Australian, Vegetarian Friendly, Gluten Free Options, Veg...

Figure 2: Map



Most Popular

Cheap Eats | Mid-range | Fine Dining

Online Bookings

Open Now

Cuisine Type

Cuisine Type
All Cuisines

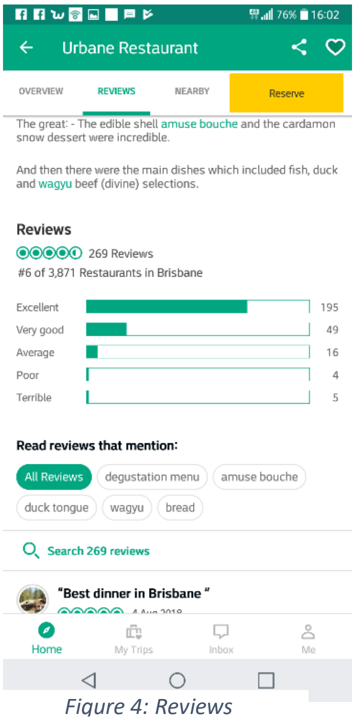
Dietary Restrictions

Dietary Restrictions
None

Minimum Traveller Rating

3 | 4 | 5

Figure 5: Filters



The great: - The edible shell amuse bouche and the cardamon snow dessert were incredible.

And then there were the main dishes which included fish, duck and wagyu beef (divine) selections.

Reviews
269 Reviews
#6 of 3,871 Restaurants in Brisbane

Excellent	195
Very good	49
Average	16
Poor	4
Terrible	5

Read reviews that mention:

"Best dinner in Brisbane "

Figure 4: Reviews

OpenTable

Android: https://play.google.com/store/apps/details?id=com.opentable

Apple: https://itunes.apple.com/au/app/opentable-restaurant-bookings/id296581815?mt=8

OpenTable is an Application, which allows the user to reserve a table at restaurants. Additionally, it shows the menu to all the listed places and overall ratings for the restaurant. It does not include ratings for individual dishes on the menu.

User Interface: Open Table's homepage is a grid of clever different browsing options such as different cuisines or settings such as romantic, scenic, good for groups etc. The app has no consistent UI elements. This means you must often navigate back to the main page to search, check your profile and more.

Home page: The homepage is simple and visual. It emphasises cuisine type. Everything presented here is filtered by some given location which defaults to the user's current location. It has a stack layout with 3 options. You can choose restaurants open tonight with a table available, restaurants near you and browse by cuisine. There is also a search button which allows you to search a restaurant based on location and table available.

Filter option: There is a filter icon and a map icon up in the right corner. The filter option has Sort by, Distance, Price, Cuisine, Neighbourhoods, Special offers, Seating Options and Amenities. You can sort by Best, Distance, Name and Rating.

Restaurant information: The app has all information necessary about the restaurant: Phone number, Price range, Cuisine, Hours, Payment options, Parking, Dress code and Description.

Each restaurant has an option to book a table, which is the apps biggest selling point.

There is a "menu" tap which redirects you to the restaurants homepage. FoodRadar will have this built into the app.

The "review" tap has 4 different factors: Food, Service, Ambiance and Value. You cannot search through the reviews.

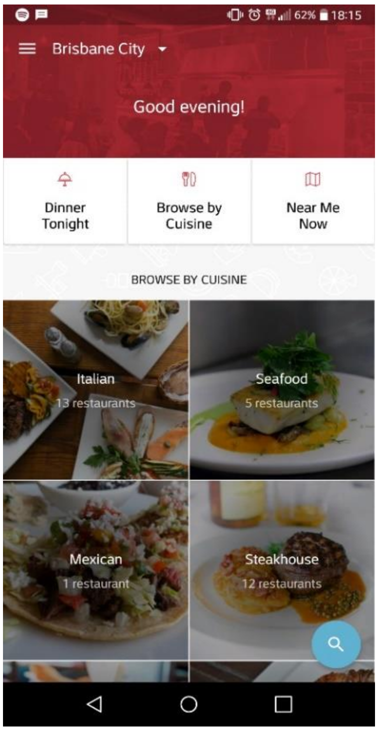


Figure 6: Homepage

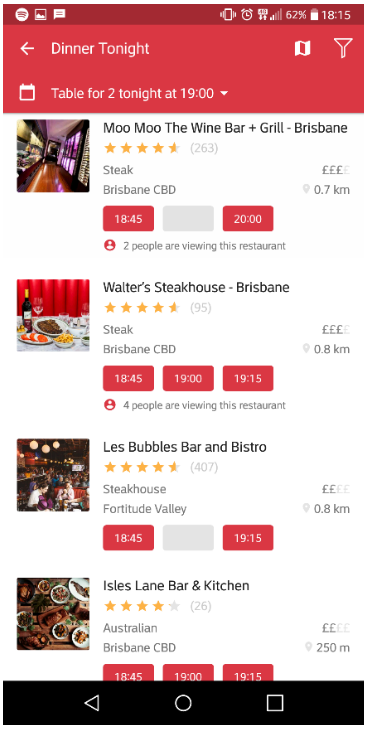


Table for 2 tonight at 19:00

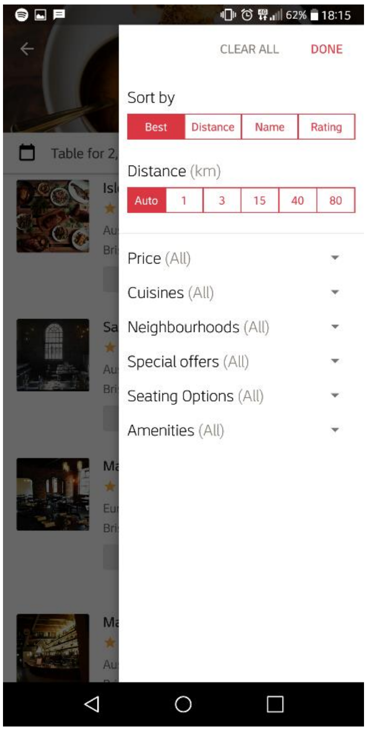
Moo Moo The Wine Bar + Grill - Brisbane
★★★★★ (263)
Steak ££££
Brisbane CBD 0.7 km
18:45 20:00
2 people are viewing this restaurant

Walter's Steakhouse - Brisbane
★★★★★ (95)
Steak ££££
Brisbane CBD 0.8 km
18:45 19:00 19:15
4 people are viewing this restaurant

Les Bubbles Bar and Bistro
★★★★★ (407)
Steakhouse ££££
Fortitude Valley 0.8 km
18:45 19:15

Isles Lane Bar & Kitchen
★★★★★ (26)
Australian ££££
Brisbane CBD 250 m
18:45 19:00 19:15

Figure 7: Search

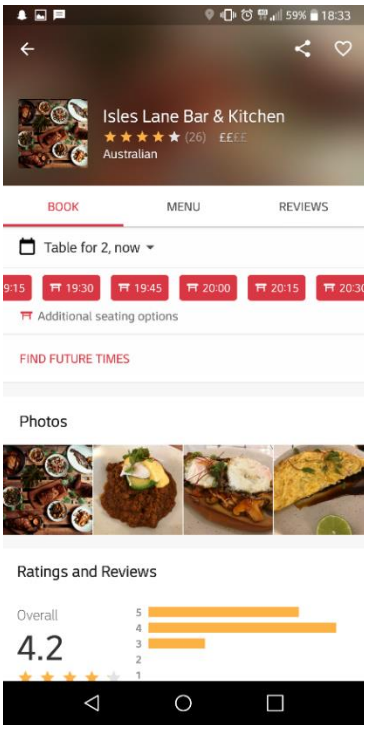


Sort by
Best | Distance | Name | Rating

Distance (km)
Auto | 1 | 3 | 15 | 40 | 80

Price (All)
Cuisines (All)
Neighbourhoods (All)
Special offers (All)
Seating Options (All)
Amenities (All)

Figure 8: Filters



Isles Lane Bar & Kitchen
★★★★★ (26) ££££
Australian

Table for 2, now

Additional seating options

Photos

Ratings and Reviews

Overall
4.2

Figure 9: Restaurant Details

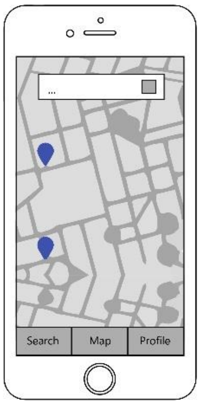
B – Mobile App Design

Task 1: User Interface Design

UI Prototype (Wireframes): Detailing Patterns and Styling

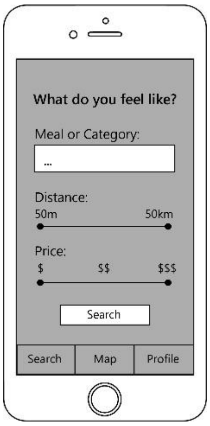
The wireframes for Foodradar feature a uniform style and layout feel. Fonts and colours will remain consistent from form to form to build a consistent brand identity. A constant Tabbed Menu is featured on all screens as the most important navigation element, creating a natural hierarchy and allowing the app to be navigated easily. Similar styling for repeated elements such as list views, buttons, text entry, and icons, will also aide visual consistency and navigation. Care has been taken to avoid the use of Dark Patterns to ensure the design remains ethical.

Map



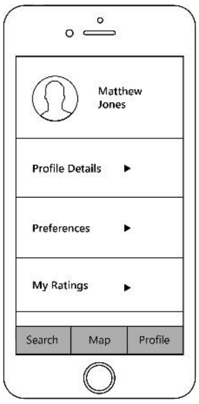
The Map Screen acts as a home screen for the app. It is the first screen displayed upon opening the app. By default, the map screen displays all stores close to the user however, if the user searching using the top search bar, they can refine the stores shown. The user can tap on a store's location marker to navigate to the Store Info Screen and see more information about the location.

Advanced Search



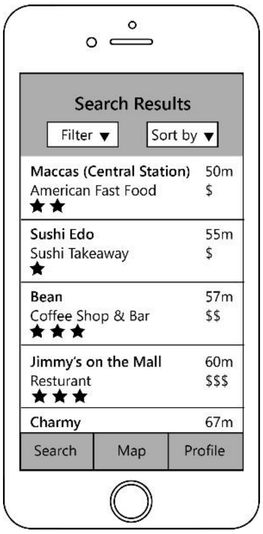
The Advanced Search Screen shows a more complex breakdown of search criteria, allowing the user to specify the exact meal they're searching for through text, as well as the price range and distance of the store through use of sliders. More search criteria could be added to this screen according to user demand.

Profile



The Profile Screen displays the user's personal information such as Profile Details, Preferences, and Ratings. These are accessible from an Expanding List view.

Search Results


Search Results

Maccas (Central Station) 50m
American Fast Food $
★★

Sushi Edo 55m
Sushi Takeaway $
★

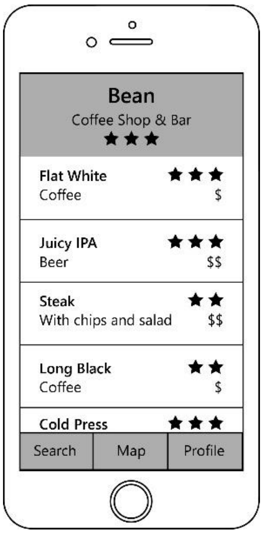
Bean 57m
Coffee Shop & Bar $$
★★★

Jimmy's on the Mall 60m
Resturant $$$
★★★

Charmy 67m

The Search Results Screen displays a scrollable list of stores meeting the search criteria. For each store, a short description, average rating, distance, and average price is shown. The user can view more information about a specific store through tapping on it to navigate to the Store Info Screen.

Store Info Screen


Bean
Coffee Shop & Bar
★★★

Flat White ★★★
Coffee $

Juicy IPA ★★★
Beer $$

Steak ★★
With chips and salad $$

Long Black ★★
Coffee $

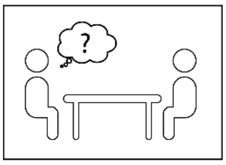
Cold Press ★★★

The Store Info Screen displays a description of the chosen store, as well as their overall rating, in a header section. Underneath, in a scrollable list view, individual items on the menu are listed and rated by quality and price.

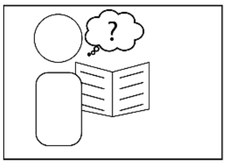
Storyboards

Scenario 1 – “What to order at this store?”:

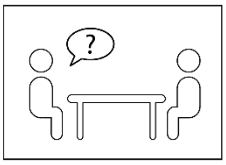
Without FoodRadar:



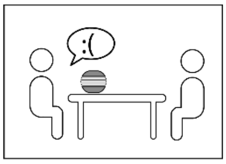
Person is at store and doesn’t know what to order



They look at the menu, but are not sure which meal is the best

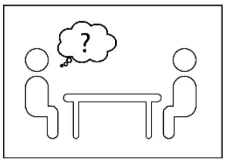


They order by guessing based on the information on the menu

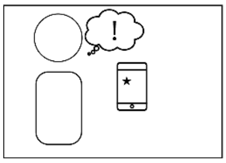


The meal they are given did not live up to their expectations and they are disapointed

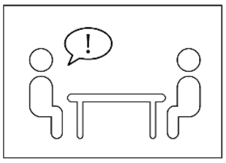
With FoodRadar:



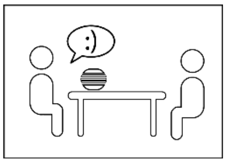
Person is at store and doesn’t know what to order



They look at the FoodRadar app, which shows other user’s ratings of the meals on offer



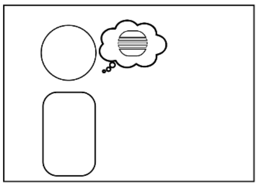
They order using the information they read on the FoodRadar app



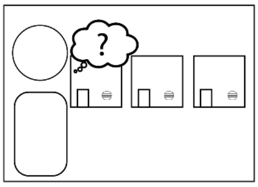
The meal they are givien met their expectations and they are pleased

Scenario 2 – “Where to find a good burger?”:

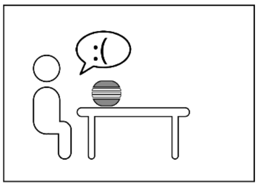
Without FoodRadar:



Person is craving a specific food but doesn’t know which store serves it best

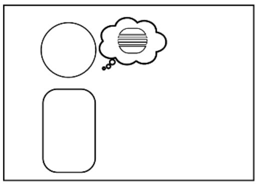


They look around their area and find a few stores, but don’t know which to pick

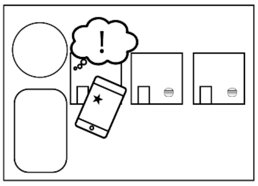


They guess which store to pick, upon recieving thier food they are dissapointed with the quality

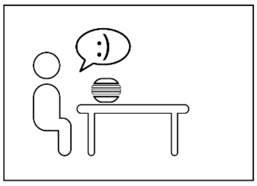
With FoodRadar:



Person is craving a specific food but doesn’t know which store serves it best



They look at the FoodRadar app, which rates the meal they are looking for at many different stores



They pick their store based on FoodRadar’s recommendation, upon recieving thier food they are pleased with the quality

User Stories

- As a restaurant owner I want to add my menu and prices so customers can decide to visit my restaurant
- As a restaurant owner I want to see what competing restaurants are doing so I can adjust my own business.
- As a student I want to filter the nearby restaurant by price so I can find a good and cheap place
- As a traveller I want to find a restaurant that serves good, local food so I can experience local culture.
- As an Italian I want to find good spaghetti carbonara so I can feel at home.
- As a restaurant customer I want to find the best dish on the menu so I can get the best experience at this place
- As a person with specific taste I want to see the menu before visiting a restaurant so I will not be disappointed when I get there.

Task 2: Software architecture and implementation

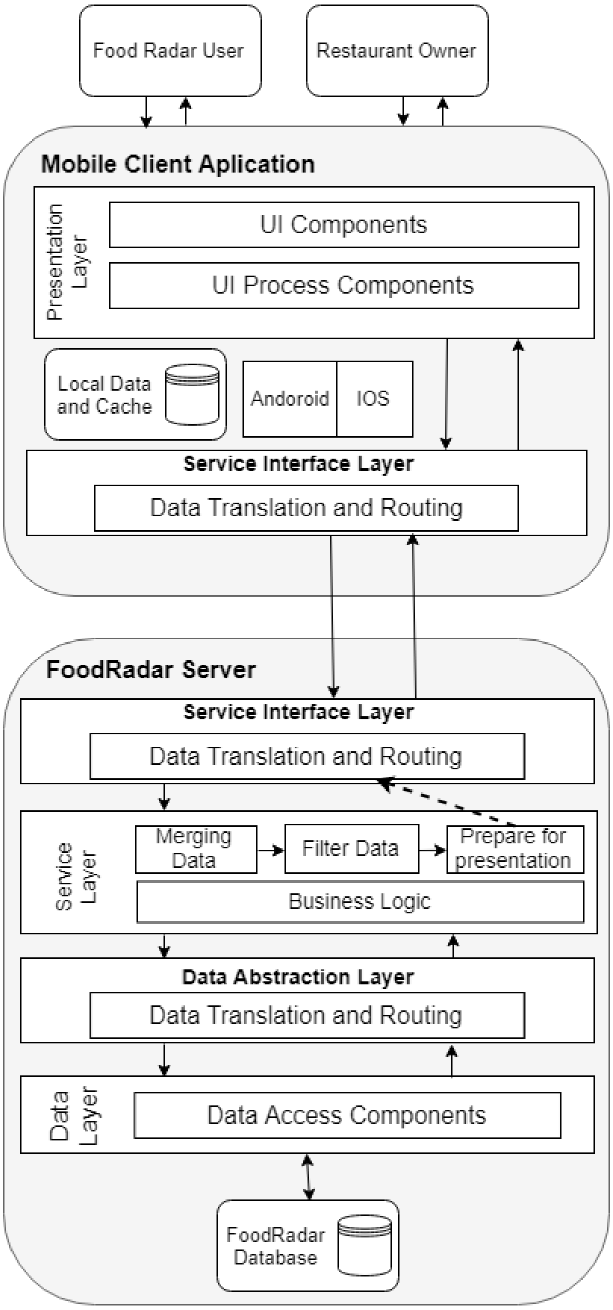


Figure 6: Hardware and Software architecture

Our system architecture consists of four main components grouped into the three classic tiers, presentation, application and data. In the presentation tier are two types of user devices, the customer's and the restaurant owners, the application tier contains Food Radars servers and our database is within the data tier. The mobile application is meant to give the user's an aesthetically pleasing and easy way to find information on restaurants and individual dishes and requires only a thin client on the user's device with minimal business logic. Internet access is necessary at all times for the service to function. The information required is too large to justify storing it on the user's device with.

The software architecture is layered to adhere to good coding standards such as the single responsibility principle and separation of concerns. One layer is concerned with presentation of the user interface, one containing business logic and the third data operations. With the addition of two interface layers to increase modularity and ensure loose coupling between layers we arrive at a five-layer architecture. This separation and structure maps well onto our overall system architecture. We intend to enforce strict layering so that each layer can only communicate via the interface layers to simplify the program.

We intentionally delay deciding many specific details of the app to allow for flexibility and potential to evolution in the implementation of the application.

Flexibility and Maintainability

The five-layer architecture introducing proper separation of concerns and enforcing every component to only be responsible for a specific feature ensures the system is modular, flexible and easier to maintain. Changes to the UI can be introduced by changing the appropriate Xaml-File and only require changes to the presentation layer. Different technologies can be integrated by connecting them to the right Interface in the Data Abstraction Layer or Service Interface Layer. The maintainability of current applied technologies will depend on the complexity. Since there will be a web interface for the business owner, which will offer the possibility to manage their own business account, it would be possible to migrate to other platforms and expand to a customer-based web application.

Testing

Our software architecture supports testing through a modular class-based structure. Each class in our project will have appropriate Unit Tests allowing us to check for possible errors or unexpected behaviour automatically. Further UI-Tests will be written to test basic-functionality, like adding new dishes or writing reviews. In addition, as we develop our solution further, our project will be able to undergo System Testing, manually looking at the functionality, usability, and overall UI design and intuitiveness.

Integration

The five-Layer-Architecture provides separation of different processes, services, and data stores, meaning that different sections of the system can be modified or replaced without making changes to the rest of the system.

For example, new back-end systems could be added to the data layer and connected to the data abstraction layer, which should provide a corresponding interface to connect the new back-end system to the service layer. So, it would be easy to connect new data services, such as the Zomato API, to provide more data for a more detailed search. These services would have to be adapted to the connected back-end system, and therefore would require a medium amount of work to integrate. Despite this, making these changes to the back-end system should not require drastic changes to the other layers.

The FoodRadar service layer would be a cloud solution, for that reason integrating another Cloud Solution or Web Service would require replacing the current system or modifying it by adding a new service. As this will be separated from the other layers of the system, these changes should be mostly isolated to the service layer, leaving the other layers mostly unchanged.

In these ways, the five-Layer-Architecture of our system supports the future integration of cloud solutions, web services, and back-end systems.

Reference List

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