Software Requirements Specification

Papi's AR Bakeria - Version 1.0 Approved

Prepared by Group No. 1 - Section 5217

Samia Sohail Azim - 18553
Saba Fatima - 18556
Muhammad Ahmed Edhi - 18584
Muhammad Hamza Hussain - 19649
Shehryar Raza - 19681
Sameer Irfan - 18659
Sadaan Khan - 19731
Muhamamd Moosa Hashim - 18642

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1.   Introduction

1.1   Purpose

This report is the first draft version 1.0 of our planning of the augmented reality project .The Purpose of this project is to design an augmented reality project for bakery items. This project includes several components which eases users to experience multiple objects at the same time under the umbrella of Augmented Reality.

1.2   Document Conventions

- Normal Text:

    - o   Font Size: 11

    - o   Font Style: Times New Roman

- Section Heading:

    - o Heading Style: Heading 1

    - o Font Size: 18

    - o Font Style Times New Roman

    - o Bold

- Sub Sections Heading:

    - o Heading Style : Heading 2

    - o Font size: 14

    - o Font Style: Times New Roman

    - o Bold

1.3   Intended Audience and Reading Suggestions

This document will be a main source for developers who might need to review user requirements on a time to time basis, their main flow of reviewing should include the Overall Description Section first in order to have background of the project and then they can refer to requirements and use cases section . Project managers will also be key users of this document to break down tasks for teams and track them. To get their job done they have to review the whole document from start to end in a manner in which it is documented. Marketing Managers can also take help from this report in order to plan their marketing campaign so the most relevant section to them will be the overall description section. Moreover Testing and Quality Assurance will also be using this report to verify that what actually was needed is it developed or not?. Last but not the least Users of AR bakery items application who can review software and hardware requirements etc from functional and nonfunctional requirements.

1.4   Product Scope

AR bakery items project is intended to provide users a home based solution where they can come up with decisions of ordering their snacks in an efficient manner by experiencing the actual visuals of objects to their markers of location. In this they can see 3D items on their table or anything where they wish to place their items and will have multiple options in terms of deciding the quantity and product specification respective to their event demands. Moreover when they are satisfied with their decision by actually looking at them in an AR environment then they can also place order through that Application as well.

1.5   References

- ➔ Markers References:
  - ◆ https://blog.beaconstac.com/2020/03/augmented-reality-qr-codes/
- ➔ Developer Tools:
  - ◆ 1)Unity 3D API Documentation:
    - ● :(http://unity3d.com/company/support/documentation/)

2.   Overall Description

2.1   Product Perspective

- Augmented reality bakery application will be a new self-contained application which will not be related to any other existing system, or a component of a larger system.
- The aim of the application is to provide customers with an easy-to-use interface where they can order bakery products.
- The customers will be able to view the bakery items in 2D as well as 3D(using Augmented Reality), add, remove, update items from the cart and then place the order accordingly.
- Our final objective will be that the order placed by the customer reaches the destination without any hassle and on time.
- The application will be supporting mobile operating systems only for the ease of customers as moving around with a laptop to use the AR features would be difficult as the application will be requiring a camera to read the markers.
- Use case diagrams will make our product more understandable.

2.2   Product Functions

Functions that our product will provide to the user:

Login Feature

- Each user will have the option to sign up, create a new account and log in. This will allow them to save their data.
- Users will also have the option for guest login but on logging out from the app the data of the user will not be saved.
- User can also access the forgot password option in case he/she is unable to recall previous one.

Home Page

- Users will have the option to choose between hot and cold bakery items from the menu.
- The users will have the option to view different products in Augmented Reality.
- The user can tap on the user profile icon to access user profile interface
- The user can view the cart by tapping the cart option

View Product

- The properties (costs, specifications etc.) of each item are displayed by clicking that item on the application.
- Users can also view each item in Augmented Reality through specific predefined markers.
- Users will be guided through the AR interface.
- Users with an account, will have an option to add items to a wish list for ordering later.
- Users will have the option to customize the product which they'll be able to do on the application only and preview the item before placing orders.

Cart

- User has the options of adding, deleting and updating items on the cart.
- Users will be able to view the total payable amount in the cart.
- Estimated shipping/delivery cost will be displayed in the cart.

Payment Options

- Users can view the bill and pay the amount through online means and complete orders totally on application. The user can also pay cash on delivery.
- Users will have an in-app wallet, with options to top up and use credits to pay for the order.
- Users will have the option to receive a slip with the order being delivered.

User Profile

- Users can view their wishlist/favourite list from the profile.
- Users will also be able to view their past order history and an option for feedback.
- Users will also get an option called "Prev Order". This will instantly place the previous order again, avoiding the hassle users will have to go through in the menu.
- Users will have an option called "Quick Order" with a pre-made list of items by the user. This will instantly place the order, again avoiding the hassle users will have to go through in the menu.
- Users will have an in-app wallet, with options to top up and use credits.
- All the amount the user spends through the app will help them gain credits which they'll be able to cash in/withdraw/redeem once above a specified threshold.
- There will be a list of special days where a user can set birthdays, anniversary, etc. and the app can notify the user about the day and show incentives to the user to make their day memorable.

Delivery and Tracking

- Users can have the option to Schedule delivery or ask for an instant delivery.
- Users will also have the option for contactless delivery.
- Users can track the orders placed along with TrackID and time.
- Users will have the option to attach personalized messages with the ordered items otherwise they'll receive a default greeting from the bakery.
- Users will have the option for simple packaging/ fancy packaging/ insulated packaging.

2.3   User Classes and Characteristics

Users of this app should have basic know-how about smartphones.

The following users might use this product:

- An average adult who wants to organise a small gathering at his home and is confused about arrangements at his place to be made in a short amount of time, he will be using this user-friendly app, with AR feature he will be able to see how much and what things he/she should order to make the party perfect.

- Event organisers who decorate small places like cafes, lawn etc on customise basis and are Tech Savvy, they can indulge themselves to use this application so they can provide a view of their decoration to customers. This strategy will bring a USP in their business in a way that they give a real feel of their action before it is implemented.

- Another class of user will be local dessert shops who already have their user applications but after experiencing our product functionalities they would like to integrate API calls of our projects into theirs.

2.4   Operating Environment

Hardware Platform

- The Augmented Reality Application for bakery products will be a mobile application only.

Operating System

- The mobile application will run on all the compatible android versions currently in use. (Android 7 or better)

DBMS

- Firebase cloud-hosted database will be used to store all the data of our bakery application.

2.5   Design and Implementation Constraints

- Android devices must be compatible with ARcore and must have a built-in camera.
- The programming language used for application should be Java.
- The firebase DBMS has limited storage capacity for free (1GB) hence once the specified storage is occupied by the database, the application will have to pay for using the firebase cloud server.
- Free DBMS is resource limited and has limited features, hence the developer might face difficulty while coding some of the functionalities of the application.
- Users must grant permission to access the camera as the application would interface with the mobile's camera.
- The application might not work well in the night view or in dark areas hence good lighting is required for the camera to read the markers.
- Short span of time is given to design this application hence the developer needs to ensure that they cover all the functionalities of the application given the time constraint.

The user's device shall have:

1) A working camera.
2) A working Wi-Fi connection.
3) AR compatibility
4) Sufficient memory storage to install the application.
5) Sufficient battery life to run the application.

2.6   User Documentation

- The product will come with a user manual to guide the user. The user manual will include the overview of the product, details of the software used, and contact info, i.e., email or UAN number. Online help will be provided through email only. Tutorials on how to use the application will also be included with the user manual.
- Apart from the user manual, the application will also guide the new users to navigate through the application and how to use it.

2.7   Assumptions and Dependencies

Dependencies

- The user's phone comes with at least an Android 7 (or newer) operating system to run the ARcore application.
- The user's phone has a working camera.
- The user's phone should have internet connection to use the application and to ensure connectivity to the database.

Assumptions

- The user grants permission for the app to use the camera.
- The application user is using an Android phone.
- The database server should be functional 24/7.

3.   External Interface Requirements

3.1   User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

3.2   Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

3.3   Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

3.4   Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

4.   System Features

4.1   Login Feature

4.1.1   Description and Priority

Login feature offers sign up, sign in and guest login options to facilitate users. By offering these options, profile security is ensured and user identification is enabled.

It will be of Higher priority since security of profiles is needed.

4.1.2   Stimulus/Response Sequences

- **Sign up Case:**

When a user opens the application, a Login interface will appear in which there will be four options to choose from. The user can either Sign up, Sign in, Login as Guest and can reset password by choosing the *forgot password* option. While tapping the *Sign up* option, the user is provided with a form from the system that asks the user to enter relevant details. By tapping the submit button the information is verified such as email address and password is validated. In case of errors, an alert is raised and the user is notified to refill the provided fields or else the application sends a confirmation email to the user's email address.

After verification a new user account is created and the user gets signed in to the application.

- **Sign in Case:**

When the user opens the application he/she can choose to sign in to the application if he/she is an existing user. While tapping on the *Sign in* option, the user is provided with a sign in form asking for email address and password. The user enters the related information to the fields. The credentials are verified by the System. In case of errors, an alert is raised and the user is notified to refill the fields with the valid information.

If the user is unable to recall his/her password, he/she is provided an option to reset password by using their email.

If the user is successful with the sign in process, the user gets signed in to the application.

- **Guest Login Case:**

When a user opens the application he/she can choose to login to the application as a guest regardless of having an account. He/she can be an existing user but this feature facilitates all kinds of users to view the application but offers limited requirements.

The user taps on the *Login as Guest* option, and the System redirects the user to the application (Homepage Interface).

- **Forgot Password Case:**

  If a user is unable to recall their password, they can tap on the *forgot password* option to reset their password. The System will send an email to the user to reset the password and after validating the new password, the user will be signed in to the application.

4.1.3   Functional Requirements

- FR-1: Each User will have the option to sign up (create a new account). A form with Sign up details will be provided to the User.

- FR-2: System will verify email provided by the user. If a user enters an email that an existing user has, the System will raise an error/alert.

- FR-3: System will validate password provided by the user. If a user enters a password that is not following required convention, the System will raise an error/alert.

- FR-4: Each User will have the option to sign in (log in). A form with Sign in details will be provided to the User.

- FR-5: System will verify password provided by the user while logging in. If a user enters an incorrect password and/or System is unable to recognize the password provided by the User, the System will raise an error/alert. If a user forgets a password he/she can reset it using their email.

- FR-6: Users will be allowed to login as guest user. Users will be redirected to the homepage.

- FR-7: Users can choose to change their password in case they're forgotten.

While signing in if a user forgets their password he/she is requested to reset the password by using their email and/or there is an option already available to facilitate Users to reset password without trying to sign in.

Use case name		Sign up
Related requirements		FR-1 FR-2 FR-3
Goal in context		A new user can sign up to make a profile
preconditions		User does not exist
Successful end condition		New User/account created
Failed end condition		New user not created
Primary actors		User
Secondary actors		Bakery Database
trigger		A new user taps on sign up button
Included cases		· Email verification · Password validation
Main flow	step	action
	1	A new user clicks on sign up button
	2	App provides the user with a form asking relevant details to be entered.
	3	User enters the details.
	4	System verifies the information and saves it to the database server.
	5	A new account is created and is logged in to the homepage.

Use case name		Sign in
Related requirements		FR-4 FR-2 FR-5 FR-7
Goal in context		Existing User can enter its profile by signing in
preconditions		User's account exists
Successful end condition		User can access the application
Failed end condition		User faces issues while logging in to the application
Primary actors		User
Secondary actors		Bakery Database
trigger		An existing user taps on sign in button
Included cases		· Email verification · Password verification · Forgot Password
Main flow	step	action
	1	An existing user taps on the sign in button.
	2	System asks to enter email and password.
	3	User enters the details.
	4	System verifies the information.
	5	User gets logged in to the application and enters the homepage of the application

Use case name		Guest login
Related requirements		FR-6
Goal in context		Any (existing or non-existing) user can log in to the application.
preconditions		User does not exist
Successful end condition		Users can use the application without making a personal account.
Failed end condition		-
Primary actors		User
Secondary actors		-
trigger		User taps on Guest login button
Included cases		-
Main flow	step	action
	1	A new user taps on the guest login button.
	2	Application redirects User to the homepage.

Use case name		Forgot Password
Related requirements		FR-7
Goal in context		Password needs to be reset.
preconditions		User forgot the password and is unable to sign in.
Successful end condition		Recovery email is sent.
Failed end condition		Email is not identified.
Primary actors		User
Secondary actors		Bakery Database
trigger		· User taps on Forgot Password option · After entering wrong credentials multiple times the user is requested to reset password.
Included cases		-
Main flow	step	action
	1	User taps on the forgot *password* option.
	2	Users are asked to reset their password using the email.
	3	Password gets updated.
	4	User gets signed into the application.

4.1.4   Use Case Diagram
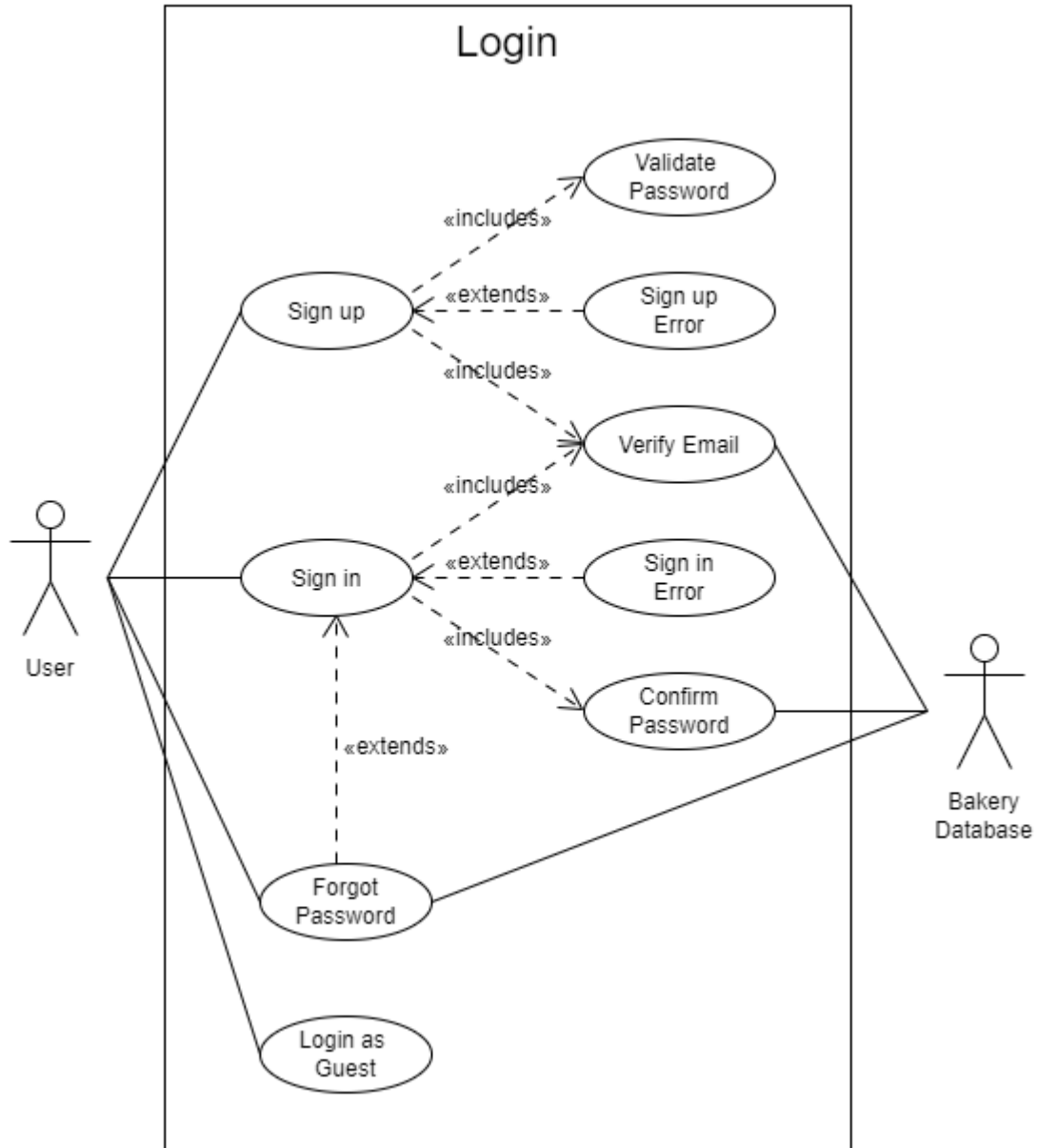
4.2   Home Page

4.2.1   Description and Priority

This is our main home screen where the user will have three tabs namely: menu of bakery items, decorate table, and view profile.

This will be a high priority feature because it displays all the options that the app offers to the user.

4.2.2   Stimulus/Response Sequences

- The home page appears to the user once they have logged in or used guest login.
- From the home page, the user will have different options to select from, such as the user can click on the menu, decorate table, and view profile buttons.
- View menu case: On clicking the menu button the user will be redirected to a new screen where a list of products with two different categories hot and cold products will appear.
- Decorate table case: On clicking the "decorate table" button, the user's mobile will ask permission to access the camera, if the user allows it, the camera will scan markers specific to different items, else if the user denies access to the camera, the user will return back to the home page. If the process is successful, different products will appear on the user's device in augmented reality.
- View profile case: On clicking the "view profile" button the user will be redirected to their profile where the user's account details, previous orders history, etc will appear.

4.2.3   Functional Requirements

- FR-1: After logging in or using guest login, the home page will appear to the user.
- FR-2: From the home page, the user will have the option to redirect to the menu screen.
- FR-3: From the home page, the user will have the option to redirect to their profile.
- FR-4: On the home page, the user will have the option to view different items in Augmented Reality using the "decorate table" button, this option would work only if the user allows access to their device's camera.
- FR-5: On the menu screen, the user can select items from two different categories, hot and cold products. The list of cold items are divided into subcategories cakes, ice creams, pastries, brownies whereas the hot items contain the subcategories salad, sandwiches, breads.
- FR-6: From the menu screen, the user will have the option to view the cart.

Use case name		View Menu
Related requirements		FR-2 FR-5 FR-6
Goal in context		The user will be able to view a list of all items
preconditions		User must be on home page
Successful end condition		Scrollable Page with list of items
Failed end condition		-Connection loss from user's end -App crash -Database server failure
Primary actors		Customer
Secondary actors		Bakery Database
Trigger		Menu icon pressed on the home page
Included cases		View Cart
Main flow	step	Action
	1	User clicks on the menu icon on the home page
	2	A new screen opens up where a list of items appears divided into two categories: hot and cold. The user can also view the cart from the menu page.
	3	The user can return back to the home page from the menu screen.

Use case name		Decorate Table (QR)
Related requirements		FR-4
Goal in context		User will be able to view different products they wish to order in Augmented Reality
preconditions		User must be on home page
Successful end condition		User able to see items augmented on their device
Failed end condition		Access to the camera declined by the user.
Primary actors		User
Secondary actors		AR Application
Trigger		User chooses this option from home page
Included cases		-
Main flow	step	Action
	1	User places different markers on a table
	2	When the user clicks on the "decorate table" button, a message pops up to allow the application to access the camera.
	3	If the user allows access, the back camera of the device opens to scan the markers.
	4	User will now be able to see items specific to the markers placed in augmented reality on his device
	5	From here the user can return back to the home page again.

4.2.4   Use Case Diagram
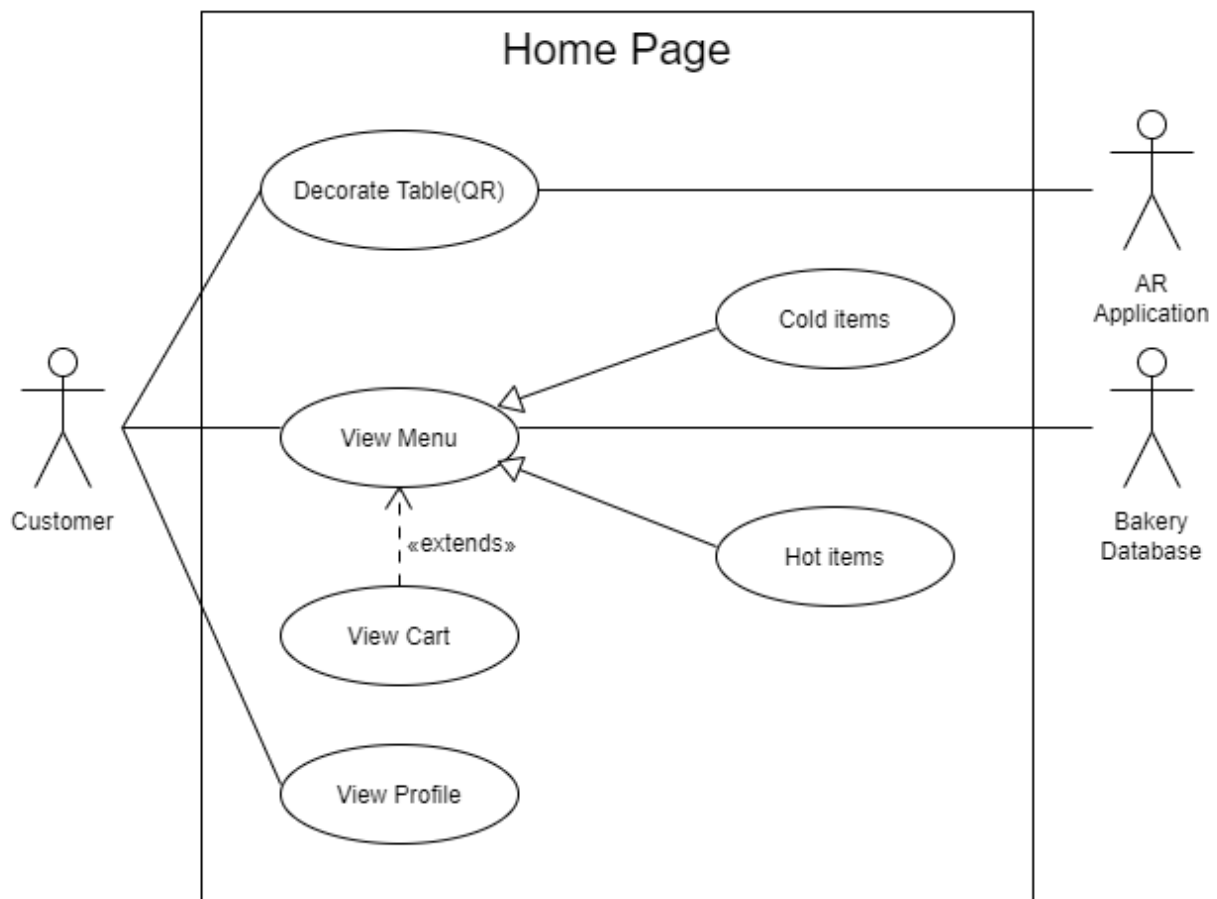
4.3   View Product

4.3.1   Description and Priority

Any item can be viewed by simply tapping on the image and all the available description is provided regarding the product. It can be viewed in 2D and 3D both and availability of the product is shown. A user can wishlist the product if needed or not available at the moment. Users can also choose to add product to the cart if needed and can increment or decrement the quantity of the product while adding to the cart. Before adding to the cart, a user may need to select required options such as size, flavor, quantity etc.

The feature will have the highest priority since it provides users with the most interactive experience and is the comprehensive feature in the application.

4.3.2   Stimulus/Response Sequences

- **View 2D Item Case:**

     While browsing through the menu, when a user selects a specific product from the menu list, he/she is taken to a new interface where the product's pictures, description, reviews, price, availability, etc will be listed along with other available options such as *AddToWishlist* and *AddToCart*. The AddToCart option is a sub-feature that will only function if the product in question is available.

- **View 3D Item Case:**

     When the user is at the 2D view interface, he/she will have an option to read a QR code and augment a product in 3D which will have interaction options. The application will ask for camera access permission and the user's back camera will serve as an environment for objects to be augmented. The user will then be able to view visual details about the product and will also have interactive functionalities. The *AddToWishlist and AddToCart* options will also be available.

- **Customize Item:**

     When the user scans a correct QR code and is viewing the product in 3D, he/she will have an option to open customization tools. The system will then compile augmentation tools and the user will be taken to a game-like interface. The user will be guided on how to navigate and use the augmentation tools through a *tutorial*. Those tools will allow the user to customize items based on the user's needs and preferences. This feature will also serve the purpose of creating new and attractive designs as future potential permanent items for the menu.

4.3.3   Functional Requirements

- FR-1: Users will have the option to view items in traditional 2D format.
- FR-2: The properties (cost, reviews, etc) of respective items will be displayed when an item is viewed.
- FR-3: Users will have the option to view items in 3D Augmented format through the 2D item page.
- FR-4: Users will be able to use the view 3D feature only if application is allowed camera access.
- FR-5: Augmentation Environment Setup/Compile.
- FR-6: The object would be augmented and viewed using the back camera of the device.
- FR-7: Users will have the option to zoom in and out to more clearly view items when augmented.
- FR-8: Users will be able to rotate the object by moving the device around
- FR-9: Users will be able to customize products which will be possible using the 3D augment option.
- FR-10: The user will be guided on how to interact with the augmented object for ease of use.
- FR-11: Users will have the option to add the item being viewed into the wishlist for ordering later.
- FR-12: User will be able to add item to cart

Use case name		View 2D item
Related requirements		FR-1 FR-2 FR-11 FR-12
Goal in context		An item and its details will be displayed
preconditions		Item must exist in menu
Successful end condition		User will be taken to new page which will show all details of item
Failed end condition		-
Primary actors		User
Secondary actors		Bakery Database
trigger		A user selects an item from the menu.
Included cases		-Show Item Properties
Main flow	Step	Action
	1	User taps an item from the menu
	2	User will be taken to product page
	3	All details of the product (cost, reviews, etc) will be displayed.
	4	The User will then have the option to view items in 3D, add to cart and add to wish-list.
	5	User will have the option to go back to viewing Menu

Use case name		View 3D item
Related requirements		FR-3, FR-4, FR-5, FR-6 FR-7, FR-8, FR-11, FR-12
Goal in context		The chosen item will be Augmented for better viewing
Preconditions		- Item must exist in menu - User Allows Camera access - Correct QR code scanned. - Login Required
Successful end condition		Item Augmented
Failed end condition		User stays in the 2D view after an Error Alert.
Primary actors		User
Secondary actors		Bakery Database
Trigger		User taps on *view in AR* option icon on view product page
Included cases		- View 2D item - Use Camera - Augmentation Setup
Main flow	Step	Action
	1	User taps an item from the menu and is taken to the product details page
	2	User selects the view in AR option
	3	User scans QR code
	4	System verifies camera access and fetches 3D model from Database

Use case name		Customize Item
Related requirements		F-:9 FR-10 FR-11 FR-12
Goal in context		The user will be able to customize and modify a product
Preconditions		View 3D Items
Successful end condition		User will be able to customize and manipulate the augmented 3D model
Failed end condition		Augmentation Tools will not be compiled and user will stay in basic 3D view
Primary actors		User
Secondary actors		Augmentation Environment
Trigger		When *customize* option is tapped from view 3D feature
Included cases		
Main flow	Step	Action
	1	Logged in user taps on *Customize* option when viewing augmented items in 3D.
	2	System sets up augmentation tools for customization.
	3	User can use these tools to customize and create their own product (custom order)

4.3.4   Use Case Diagram
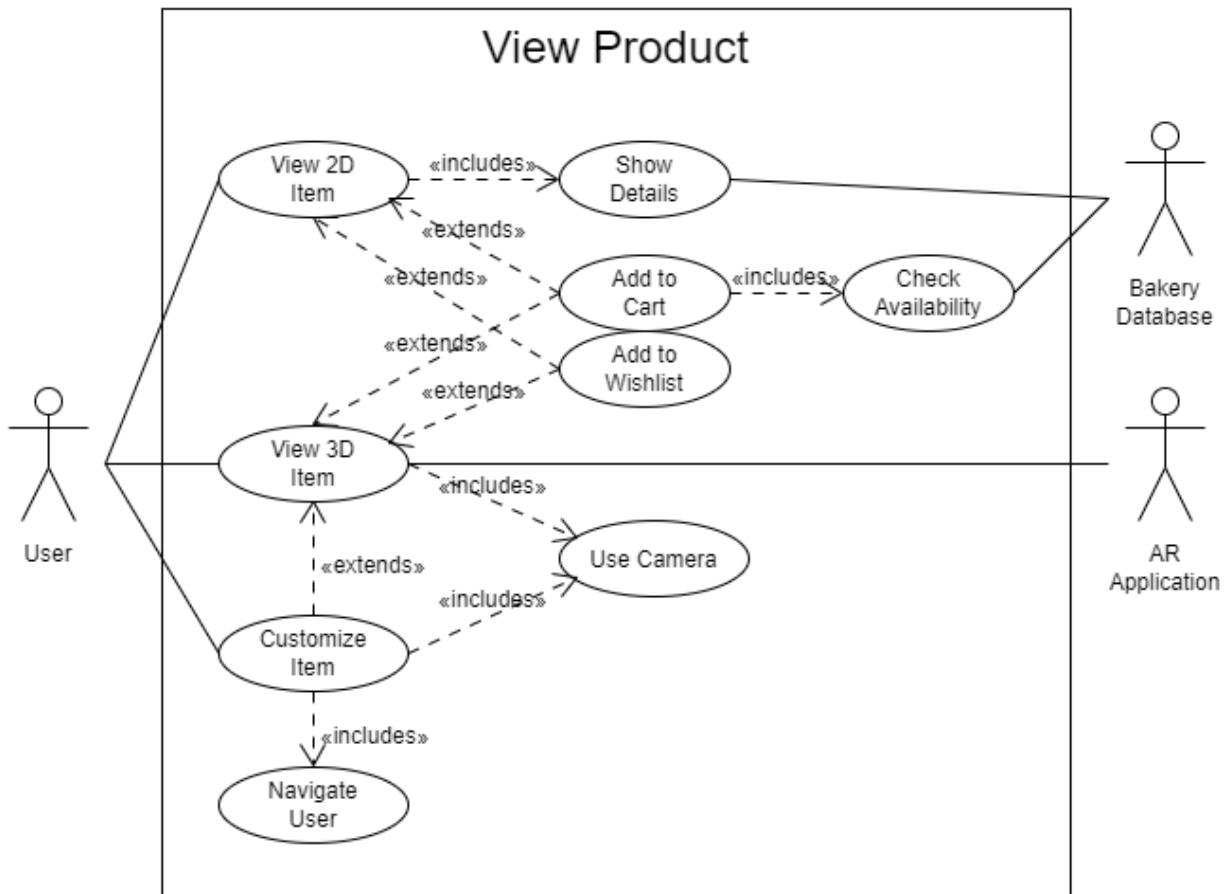
4.4   Cart

4.4.1   Description and Priority

The cart feature will allow items from the menu to be added to the cart. The cart will show all the items to be purchased as well as the total payable amount. The cart feature will also show, calculate and add the shipping cost based on inserted location.

This will be a low-medium priority feature as the cart would mainly act as a visual of the order and a *connection* between the Menu, Payment details and Delivery options.

4.4.2   Stimulus/Response Sequences

Add to Cart Case:

While viewing products from the menu user can tap "add this item" which will add that product to the cart but product has to be available otherwise the user will be intimated by the message that "this product is not available at the moment".

View Cart Case:

When a user selects the view cart option which he can do from multiple screens, he will be directed to the cart interface where he can review the products he added to cart and also see the amount of the products he intends to buy. If the user has not added anything to the cart and still wishes to view it then an empty cart will be shown with some recommendations as well.

Update Cart Case:

When a user wants to change the product or its quantity he will have options to add or delete items when he views the cart, changes in cart can also be made while selecting items for add to cart option. While updating users will be suggested with several other products as well.

View Total:

When a user proceeds to review the items in the cart , the total amount is calculated and shown in the same screen where the user can see the cart. The calculation at this point will only include items cost not the delivery and Taxes.

4.4.3   Functional Requirements

- FR-1: User can view the cart for final confirmation of the product.

  If no product was selected, an alert should be given that your cart is empty.

- FR-2: Users will have the option of adding and removing items to the cart.

  If a user adds an item to the cart and that item is unavailable, then an error alert would pop up notifying the current unavailability of that item

- FR-3: Users will be able to increase the quantity of items in the cart.

  The quantity increase option will have a maximum limit of 20, which if exceeded, an alert would pop up and restrict the quantity to 20

- FR-4: Users will be shown the calculated total payment amount including the shipping/delivery.

  If the inserted postal code corresponding to the city is invalid, then the user will not be able to proceed to checkout.

Use case name		View Cart
Related requirements		FR-1
Goal in context		User will be able to confirm items added to cart
Preconditions		1. User must have entered something into the cart. 2. User must have logged in with either personal account or guest login 3. Product must be available
Successful end condition		Items verified and confirmed by the user and proceeded for further formalities
Failed end condition		Either more than maximum number of products are added or less than minimum.
Primary actors		User
Secondary actors		Null
Trigger		User presses view cart button
Included cases		-
Main flow	Step	Action
	1	User Taps on View Cart
	2	System will check products existence in cart
	3	System will calculate total amount
	4	User will be taken to cart
	5	User will confirm the items for checkout

Use case name		Update Cart
Related requirements		FR-1, FR-2 FR-3, FR-4
Goal in context		Users can change the quantity of an item which is already entered. User will be recommended with different products also.
Preconditions		1. User must be viewing his cart. 2. User must have logged in with either personal account or guest login 3. Product must be available
Successful end condition		Items are updated to desired quantity.
Failed end condition		Either more than maximum number of products are added or less than minimum. Or product is not available
Primary actors		User
Secondary actors		Null
Trigger		Adding or subtracting button when pressed
Included cases		Recommendation
Main flow	Step	Action
	1	User adds up /reduces the current item or new items
	2 Include: Add to cart	System will check products availability
	3 Include: Recommendation	System will give recommendations for other products
	4	User Finally updates his cart
	5	User confirms the order for checkout

4.4.4   Use Case Diagram
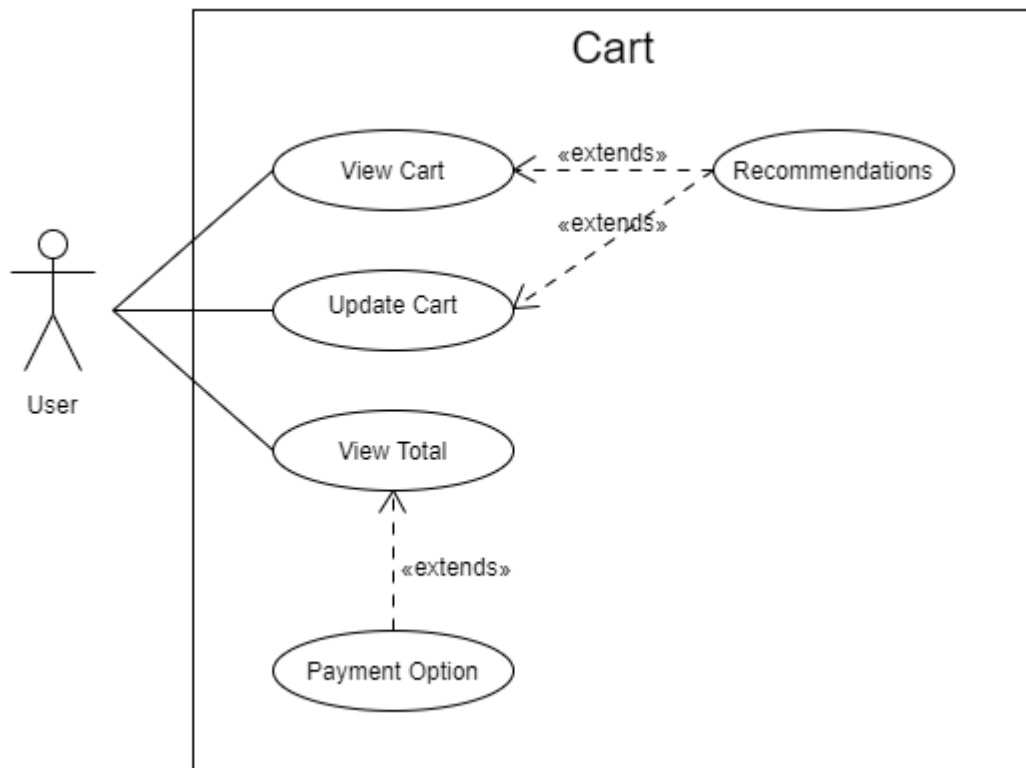
4.5   Payment Options

4.5.1   Description and Priority

This feature is like a virtual wallet integrated within the app, which will enable users to save money virtually in the app. The user can use this money to perform transactions and use services provided by the app. The user can have a positive or negative balance depending upon the type of transaction and services used. This is a Medium priority feature which enables and plays a key role in all transactions performed on or through the app.

4.5.2   Stimulus/Response Sequences

View Bill:

User will have the option to view his bill for the products' selection and add or delete products if required.

In-App wallet and Checkout Case:

While proceeding to the payment method, users can tap "add card" to enter their credit/debit card info which the app will save. After the user has added the card, or the app already has the card info, the user can pay online through their card. When a user wants to update the entered card details he will have options to add / delete / update card info When a user has proceeded to the payment method he can choose to redeem credits and pay through the credits in the IN-app wallet. When a user has proceeded to the payment method he can opt for the cash on delivery option to pay on item's arrival.

4.5.3   Functional Requirements

- FR-1: User will have the option to receive a slip with the order being delivered.
- FR-2: Users will have an in app wallet, with options to top up and use credits
- FR-3: Users can view the bill and pay the amount through online means and complete orders totally on app.
- FR-4:   In case there is an error in setting up a communication link with the bank/service user will be asked to reenter the details.
- FR-5: If the data entered is invalid user will be asked to reenter.
- FR-6: If the account linked with the details does not have enough balance or isn't allowed to make transactions user will be alerted with a message saying 'inadequate balance'
- FR-7: If the card details entered by the user are traced as a lost card/stolen card the concerned authorities will receive an auto generated message and user details, no transaction will be performed, user will be logged out automatically.
- FR-8: If the partner app/service denies service due to any reason the user will be asked to re-enter the data.

Use Case Name		View Bill
Related requirements		FR-1 FR-3
Goal in context		View itemized bill of products ordered
Preconditions		1. Must have added items to cart 2. Must have proceeded to checkout
Successful end condition		User has completed the order, confirmed product selection, and will now proceed to payment.
Failed end condition		Items not added, appropriate error message is shown
Primary actors		User
Secondary actors		Database
Trigger		User confirms selection and proceeds to payment methods.
Included cases		Verify Selection
Main flow	Step	Action
	A	User can check his product selection
	B	User confirms and proceeds to payment

Use Case Name		In-app wallet & Checkout
Related requirements		FR-2, FR 4 FR 5, FR 6 FR 7, FR 8
Goal in context		Complete your order by finalizing your transaction
Preconditions		1. Must have already completed their order and proceeded to checkout 2. If choosing online payment option à must have valid credit card details 3. If choosing to top up wallet à must have valid credit card details 4. If choosing redeem credits à must have sufficient credits
Successful end condition		The order has been successfully placed and the transaction is complete.
Failed end condition		Payment not processed, appropriate error message is shown
Primary actors		User
Secondary actors		Database
Trigger		User selects payment option and proceeds to checkout
Included cases		Verify Address Verify Payment Method
Main flow	Step	Action
	A	User can independently open his in-app wallet to check his current account and top it up
	B1	User chooses payment option and sets address
	B2	System verifies validity of payment option and address and notifies user if there is an error
	B3	Order successfully placed

4.5.4   Use Case Diagram
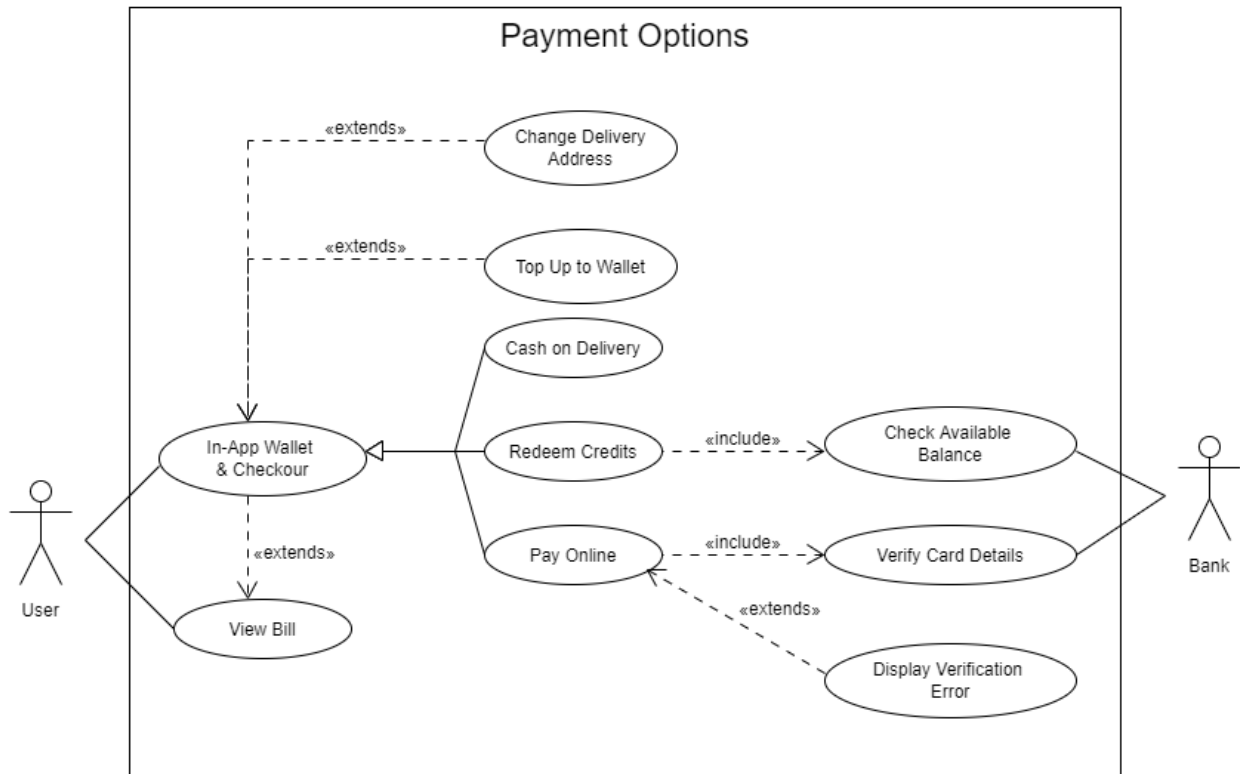
4.6   User Profile

4.6.1   Description and Priority

This feature is basically a method to create a relation between the company and the user where the users can update their profile, view order history and set up Quick Order templates. This is a medium priority feature that a user may or may not use depending on his/her requirements and convenience.

4.6.2   Stimulus/Response Sequences

- **Customise Profile Case:** Users will get an option to update their:
  - Name
  - Primary Address
  - Alternate Addresses
  - Contact Number
  - Email Address
  - Profile Photo

- **Previous Orders Case:** Users can also view their past order history and choose to re- place their previous order.

- **Quick Wishlist Case:** Users can also set up Quick Order Templates, to instantly place orders of pre-selected items. Users can view the items added to their Quick Order list. They can also add and delete items from these templates. Unavailable and other items can be wishlisted too for future orders.

4.6.3   Functional Requirements

- FR-1: Users will have an option to add their favorite or unavailable items to a wishlist.
- FR-2: Users will also be able to view their past order history and can view their activity (feedback, comments, etc).
- FR-3: Users will have an option called "Quick Order" with a pre-made list of items by the user. This will instantly place the order avoiding the hassle, user will have to go through in the menu
- FR-4: Users will also get an option called "Prev Order". This will instantly place the place the previous order again, avoiding the hassle, user will have to go through in the menu
- FR-5: The user also has the option to add/remove profile photos and edit details entered.

Use Case Name	Customize Profile
Related requirements	FR 5
Goals in context	1. Customize and Edit your Profile
Preconditions	1. Must have an existent valid account
Successful end condition	1. The update has been successfully processed
Failed end condition	Error message if for any reason your request is not processed
Primary actors	User
Secondary actors	Database
Trigger	User selects the option to edit the profile from the screen.
Included cases	Verify existing profile.

Main flow	Step	Action
	A1	Update Your Email
	A2	Update Your Profile Picture
	A3	Update Card Details

Use Case Name		Previous Order
Related requirements		FR 2 FR 4
Goals in context		1. View past order history 2. Instantly replace the any previous orders
Preconditions		1. Must have placed an order to place a previous order again.
Successful end condition		1. Viewed order history 2. Successfully replaced previous order
Failed end condition		Error message if for any reason your request is not processed
Primary actors		User
Secondary actors		Database
Trigger		User selects Previous Orders option from the screen
Included cases		Verify Address Verify Payment Method
Main flow	Step	Action
	A	View Your Previous Orders
	B	Replace a previous order

Use Case Name		Quick Wishlist	
Related requirements		FR 1 FR 3	
Goals in context		1. Add items to Wishlist 2. Instantly place order of pre-selected items	
Preconditions		1. Must have added items to their own customizable Quick Order list 2. Even if the user does not have any previous orders or a Wishlist, they will still have the option to access that feature	
Successful end condition		1. Successfully placed order 2. Successfully added item to Wishlist	
Failed end condition		Error message if for any reason your request is not processed	
Primary actors		User	
Secondary actors		Database	
Trigger		User selects Quick order option from the screen or clicks the heart next to items to add them to wishlist	
Included cases		Verify Address Verify Payment Method	
Main flow	Step	Action	
	A	Update Wishlist and send a push notification when the *'wish'* comes true	
	B	Update Your Quick Order List	

4.6.4   Use Case Diagram
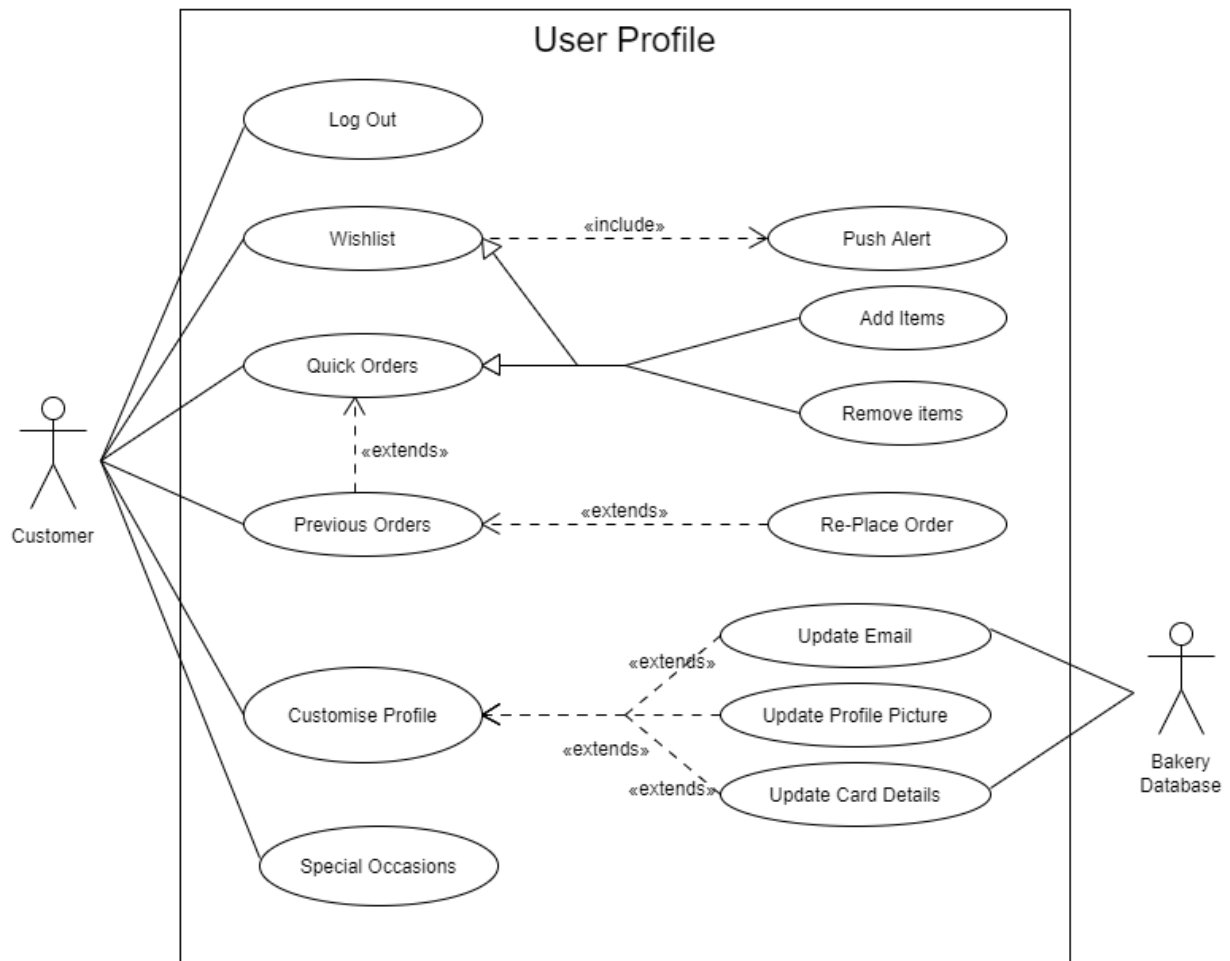
4.7   Delivery

4.1.1   Description and Priority

This feature handles the delivery requirements of a user's purchase ranging from tracking an order to customizing the packaging to choosing the type of delivery they would like.

This is a high medium priority feature because although not really needed it provides users a lot of satisfaction.

4.1.2   Stimulus/Response Sequences

● **Delivery Options Case**: After the user has finalized their cart they press the proceed button and are taken to the delivery options page. Here the user has the option to choose either instant or scheduled delivery. On clicking instant delivery the user will then be taken to the delivery packaging page. On clicking scheduled delivery the user will have the option to choose a date and time and then proceed to the checkout page. There will be a slider button to choose contactless delivery.

● **Delivery Packaging Case:** After a delivery option is selected the user is taken to this page where the user can select if they would like simple packaging or fancy packaging. There is only one default simple packaging and for fancy packaging there will be a drop down menu that the user can choose from. After a packaging type is chosen the user will then press proceed and be taken to the payments checkout page.
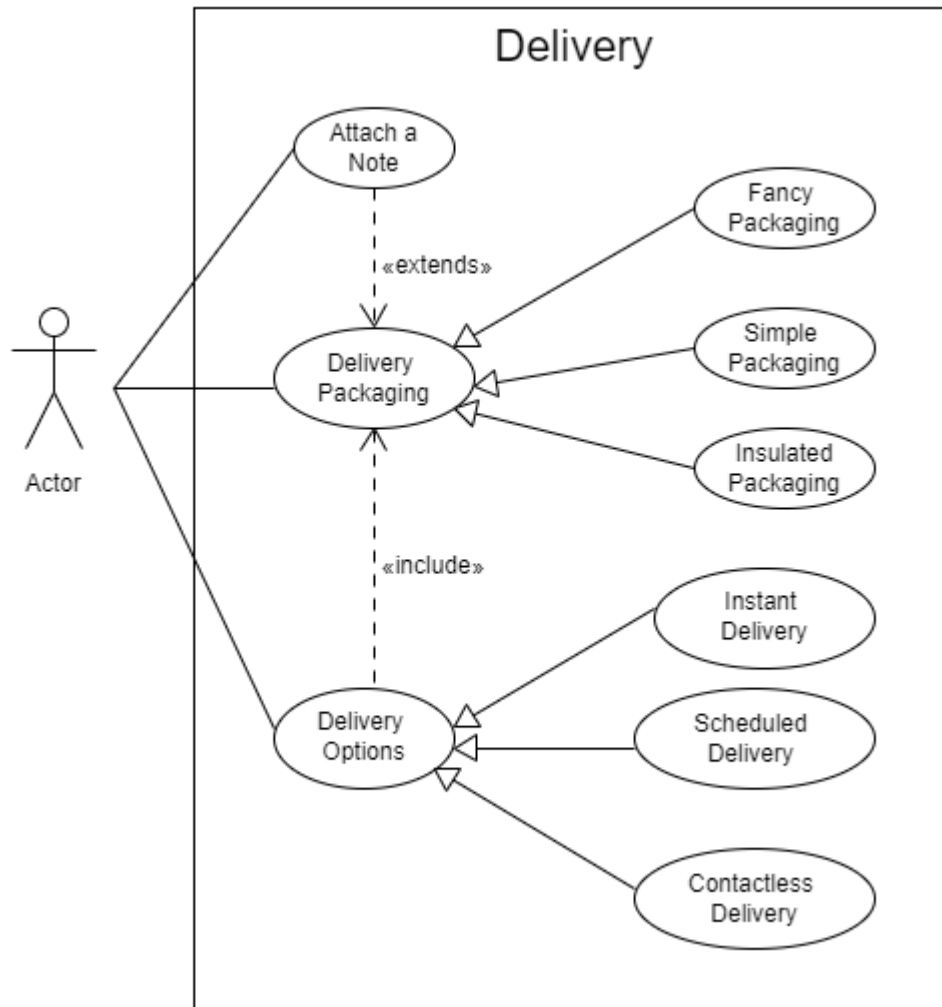
4.1.3   Functional Requirements

● FR-1: Users will have the option for either instant delivery or schedule a delivery for a certain date and time.
● FR-2: Users can also request contactless delivery.
● FR-3: Users will have the option to attach personalised messages with the ordered items otherwise they'll receive a default greeting from the bakery
● FR-4: Users will have the option for simple packaging or fancy packaging or special temperature packaging to make sure their cold items do not melt.
● FR-5: Users will be able to track the order through tracking ID.

Use Case Name		Delivery Options
Related requirements		FR-1 FR-2
Goal in context		The user will be able to choose what kind of delivery they want, either instant or scheduled delivery.
Preconditions		The cart has been filled with items.
Successful end condition		Users will be able to select their preferred delivery method and move to the next page.
Failed end condition		User didn't select any delivery method.
Primary actors		User
Secondary actors		-
trigger		When the Proceed option is tapped from the cart.
Included cases		
Main flow	Step	Action
	1	After the user has finalized their cart with items, they will tap the P*roceed* button on the screen.
	2	Users will be taken to a new page which will display the delivery options. Users will have the option for either instant delivery or scheduled delivery.
	3	Instant Delivery will place the order there and then. Scheduled delivery will give the user a drop-down menu to select the date and time when they would want their items to be delivered.
	4	User will then click *proceed* and be taken to the delivery packaging's page.

Use Case Name	Delivery Packaging
Related requirements	FR-3 FR-4
Goal in context	The user will be able to choose their preferred packaging for the items.
Preconditions	The cart has items in it.
Successful end condition	Users will have selected either simple or fancy packaging.
Failed end condition	User didn't select any of the two options.
Primary actors	User
Secondary actors	-
trigger	When the proceed option is tapped from the delivery options.
Included cases	

Main flow	Step	Action
	1	User clicking *Proceed* after selecting delivery options is taken to the delivery packaging's page.
	2	Selects either simple or fancy packaging. Fancy packaging gives a drop-down list of types of fancy packaging a user can choose.
	3	After selecting the packaging type, the user clicks *Proceed* and is taken to the payments page.

4.7.4   Use Case Diagram

5.   Other Nonfunctional Requirements

5.1   Performance Requirements

- Operating System must be Android 8.0 or newer versions
- OS must support ARcore for AR tracking
- All server requests and responses are dependent on the end user's internet connection

5.2   Safety Requirements

- Database must be regularly refreshed and backed up incase of data or system failure
- No unauthorised access to database allowed

5.3   Security Requirements

- System will make use of a secured database
    - Only authorised access will be allowed to make changes to the database
- End users will not be able to change any information except for their own
- The software will authenticate and verify the type of user logging into the system
- Different type of users for different constraints and views applicable on different developers working on different parts of the code
- End users will not be able to keep track of inventory and other users' use of the application
- User data will only be available for viewing only to select few within the team itself

5.4   Software Quality Attributes

- **Correctness:** The application will provide all the specified functionality and objectives that were discussed with the client. Correct execution and behavior of software functions as intended will be ensured using various different testing techniques
- **Usability:** An interactive and easy to navigate user interface will be used to improve user experience
- **Maintainability:** The coding and integrations should be done using comments. It will be easily customisable to integrate future functionalities to expand the product. The application will be subjected to software updates and patches
- **Reliability:** Multiple users will be making use of the application at a time. Mutually exclusive processes should not interfere with each other
- **Availability:** The application and server will be able 24/7 for the users to view the bakery and place their order
- **Flexibility:** The system should be able to recognise and place orders for varied volume of items

5.5   Business Rules

-    The application will be available on Android Devices only
-    The application will be free of charge. It must be noted that this application will be considered freeware and not open source
-    The application will support transactions
-    The application will not host any third party advertisements
-    The data entered by users involving personal information will be kept strictly confidential
-    The user will have the option of sharing their location with us

6.   Other Requirements

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

End-User License Agreement

Please read this End-User License Agreement carefully before clicking the "I Agree" button, downloading or using Bakery AR.

Acknowledgment

By clicking the "I Agree" button, downloading or using the Application, You are agreeing to be bound by the terms and conditions of this Agreement. If You do not agree to the terms of this Agreement, do not click on the "I Agree" button, do not download or do not use the Application.

This Agreement is a legal document between You and the Company and it governs your use of the Application made available to You by the Company.

The Application is licensed, not sold, to You by the Company for use strictly in accordance with the terms of this Agreement.

License

Scope of License

The Company grants You a revocable, non-exclusive, non-transferable, limited license to download, install and use the Application strictly in accordance with the terms of this Agreement.

The license that is granted to You by the Company is solely for your personal, non-commercial purposes strictly in accordance with the terms of this Agreement.

Third-Party Services

The Application may display, include or make available third-party content (including data, information, applications and other products services) or provide links to third-party websites or services.

You acknowledge and agree that the Company shall not be responsible for any Third-party Services, including their accuracy, completeness, timeliness, validity, copyright compliance, legality, decency, quality or any other aspect thereof. The Company does not assume and shall not have any liability or responsibility to You or any other person or entity for any Third-party Services.

You must comply with applicable Third parties' Terms of agreement when using the Application. Third-party Services and links thereto are provided solely as a convenience to You and You access and use them entirely at your own risk and subject to such third parties' Terms and conditions.

Term and Termination

This Agreement shall remain in effect until terminated by You or the Company. The Company may, in its sole discretion, at any time and for any or no reason, suspend or terminate this Agreement with or without prior notice.

This Agreement will terminate immediately, without prior notice from the Company, in the event that you fail to comply with any provision of this Agreement. You may also terminate this Agreement by deleting the Application and all copies thereof from your Device or from your computer.

Upon termination of this Agreement, You shall cease all use of the Application and delete all copies of the Application from your Device.

Termination of this Agreement will not limit any of the Company's rights or remedies at law or in equity in case of breach by You (during the term of this Agreement) of any of your obligations under the present Agreement.

Governing Law

The laws of the Country, excluding its conflicts of law rules, shall govern this Agreement and your use of the Application. Your use of the Application may also be subject to other local, state, national, or international laws.

Entire Agreement

The Agreement constitutes the entire agreement between You and the Company regarding your use of the Application and supersedes all prior and contemporaneous written or oral agreements between You and the Company.

You may be subject to additional terms and conditions that apply when You use or purchase other Company's services, which the Company will provide to You at the time of such use or purchase.

Contact Us

If you have any questions about this Agreement, You can contact Us:

- By email: BakeryAR_Prototype@gmail.com

Appendix A: Glossary

<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.>

Product Perspective:

Augmented Reality: a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view.

Firebase: The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client.

AR-Core: ARCore, also known as Google Play Services for AR, is a software development kit developed by Google that allows for augmented reality applications to be built.

Appendix B: Analysis Models

<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams.>

Appendix C: Future Aspects

- **We will provide incentives to the targeted customers by tracking their buying patterns and preferences.**
  Application will be able to identify user's buying patterns and preferred items, it will make a list of items that are bought frequently by a user and/or items that are purchased with another item. If any incentive is provided by the Business the targeted customers will be notified about the respective deal/offer.

- **Customers will be able to find items using voice and image recognition.**
  Customers will be able to search an item without typing on the search bar. They can speak to the application and by using the voice recognition system, the application will be able to search for the item. Customers can also search for items by providing any random image e.g, from social media, and the application can search a similar item (if available) using image recognition.