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# 

# **Project Details**

## Project Name

Barter Application

## Description

The Project Barter App

Mecachrome Software Ltd has employed us for creating a new application called ”Barter Trader”. The purpose of the app is to provide a platform to facilitate the barter (exchange) of goods among users who wish to barter various items like clothes, gadgets, tools, toys, bicycles etc.

# **Functional Requirements**

## Anonymous User - Functional Requirements

* Can view products by category in a grid arrangement
* Can view a product
* Can sign in, after registration
* Can read About, contact, terms and conditions of the application when the person decide to register.
* An anonymous can not register without accepting terms and conditions of the app

## Registered User - Functional Requirements

* Can login into a different account;
* Can register a new account;
* Can sign out
* Can recover the password
* Access His Account information:
* View Profile- including his first name, surname, telephone number, alias, email address, rating, if user is a flagged one-negative feedback and average number of the rating from other users. When rating falls below zero and the user is flagged more than 5 times, the user can no longer add new items and cannot message other users.
* View his Products-including image and title; if the user click on his product than he can see image of his product, recording, title and description
* View His Offers
* View reviews- on this page user has the option to add reviews of the user who posted the item for barter and to message the user;
* Add a product -including image, video, title, description of the item and option available to choose the right category
* Can read reviews from other users
* Can login to their accounts using their unique email address and password
* Can read About, contact, terms and conditions of the application when the person decide to register.
* Add a product including image, recording, title and description and option to choose the categories
* View the categories- From the Dashboard, when a category of item is selected (**Gadgets, Clothes, Tools, Bicycles, Others)**, the user is taken to a list of items for barter in that category
* - Categories listed for logged and anonymous users are: Gadgets, Clothes, Tools, Bicycles, Others;
* If users are selecting one of the four categories than all gadgets are displayed in a scrollable list allowing for navigability of the list;
* - The object of class Categories are dynamically read from a firebase database and then set on the activity;
* Details of each item/gadget will include: description of the item, rating of the user who posted the item, option to list all the items that this user whose item the logged user is currently viewing;
* If user is interested in the item and want to offer something in the exchange of it than user is able to message the other user with his/her offer;
* If the users agree with the barter than status of the items is changed to agreed;
* Once the item status is changed to agreed it is no longer listed in the application;

**Non-functional requirements:**

* Each category lists the same gadgets;
* When user get a call in the same time when he is using the app, then when he opens the app he should log in into his account;
* When user is adding a new product, he is acknowledged with message: “Product added successfully”
* When user open the app, it is loading within 10 seconds in such way that user doesn’t have to wait too long for app to respond

# **Wireframes**

# **Use Case Diagram**

## Diagram Design

//TO DO insert Use Case Diagram

## Brief Descriptions of Use Cases

//TO DO briefly describe each use case

# 

# **Application Design Model**

## Architectural Pattern

We’ve chosen the Model-View-View Model (MVVM) architectural pattern because Google embedded this pattern into the Android’s framework so that developers can easily implement their logic into mobile applications. Beside the ease of use, it is one of the architectural patterns which enforces separation of concerns, which divides the user interface from the business logic. The advantages of this is that the code is easy to maintain by dividing the work to frontend and backend developers, it is simple to isolate, and unit test the components and least but not last the reusability and extensibility of the classes increases the implementation speed of the project.

As seen in the figure below the implementation is divided into three layers:

* Model:

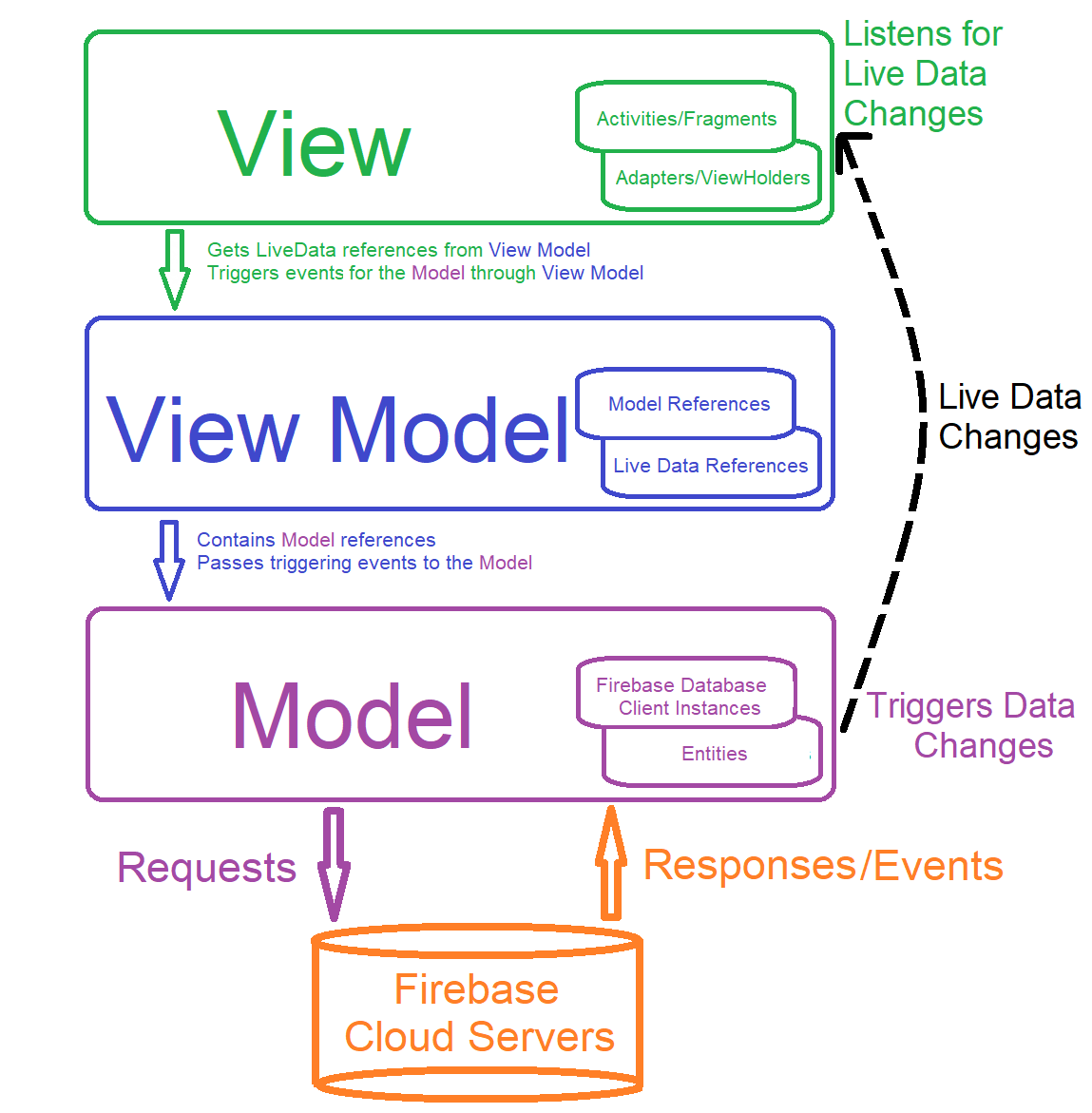
This layer represents the business logic of the application and exposes its data through the framework’s own observable data holder class, called LiveData. Beside triggering data changes, the model also contains entity classes used for structuring the data in the application and in the database. The Model also contains Firebase instances of its different clients for requesting and receiving data from the Google’s Servers.

* View Model:

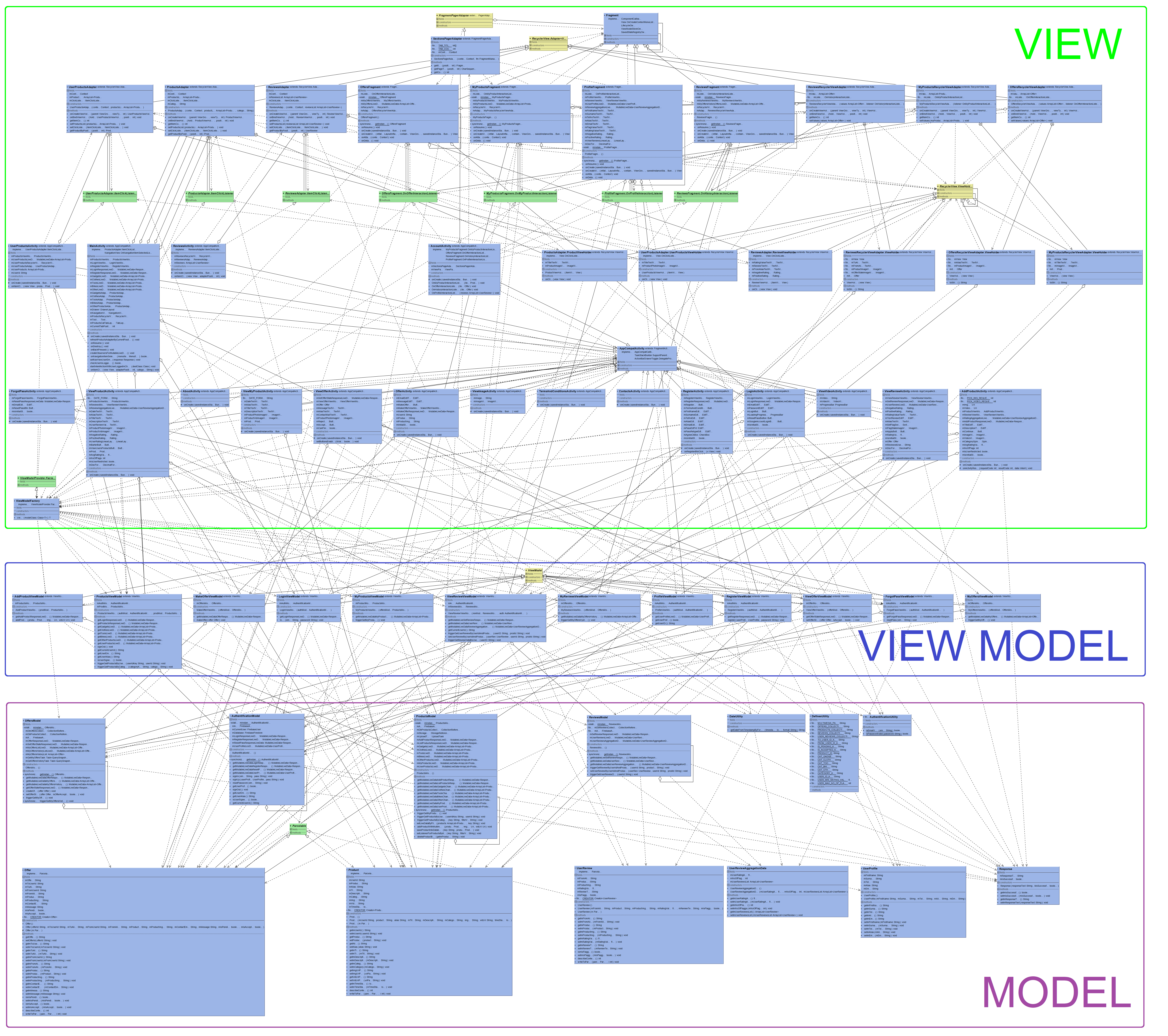
The View Model manages the Model components and provides references of the observers to the View components. Aside this, it also provides methods for passing events to the business logic. The whole idea behind the View Model is to decouple the View components from the implementation logic of the application. Android’s framework facilitates this through the ViewModel class, which is lifecycle aware and because of this allows data to be persistent even if views change their state.

* View:

The View layer only manages updates on Activity and Fragment classes with the help of their Adapters and View Holders. On this layer the View components observe for data changes in the Model and update the user interface accordingly. It also triggers events for the Model through the View Model in order to get data changes.



**Class Diagram**

Class Diagram Design

### Description of Classes

Because the system is designed as a MVVM architectural pattern and the number of classes surpasses 50, the description of the classes will be divided into Model/View/View Model categories and the common descriptions of the classes will be gathered under each group.

**View Classes**

All Activity classes extend from the AppCompatActivity and override some of the lifecycle call-back methods like onCreate(), onResume(), onDestroy. In the onCreate() method we only initialize, populate and set listeners for the UI elements, create the required view models, get the references of the exposed LiveData objects and create observers for them. In the onResume() method we only trigger events for refreshing the data in the UI elements.

Because of the complexity of the project we’ve used fragments which extend from the Fragment class and at least override onCreate(), onResume(), onCreateView, onAttach(), onDetach().The onCreateView() method is used in the fragments classes to have access and inflate its layout and also populate and set listeners to the UI elements. The onAttach() and onDetach() methods are also used in fragments to set/unset the base activity’s listener. To trigger events to the base activity, the fragments contain inner public interfaces which must be implemented by the activity in order to receive click events.

Beside static views, the project also has dynamic lists of UI elements, because of this the views use the RecyclerView UI element to list items with the help of adapter classes. This adapter classes extend from the RecyclerView.Adapter<> abstract static class and contain an inner class which extends from RecyclerView.ViewHolder abstract static class. The adapter classes are used to hold and manage the data collections, and the inner view holder classes are used to set and manage the view elements. The adapters of fragments use the fragment’s inner interface as a listener to trigger click events to the base activity, and the adapters of activities have their own inner interfaces to trigger the click events.

|  |  |
| --- | --- |
| **Class Name** | **Description** |
| MainActivity | It is the launcher activity, and it exposes the products categories through a Tab Layout in a grid Recycler View. Also, there is the option to directly add a product through a Floating Action Button, view product details or access the main menu. In the main menu you can login, register, view account information, add a new product, sign out, access the about or contact page. |
| ProductsAdapter | It is used by the MainActivity class to manage the products by category. It contains a list of Product class entities, and handles the RecyclerView layout in it’s ViewHolder inner class. |
| ViewProductActivity | This activity shows the added date, title, description, image and/or video thumbnail of the product, and the user’s alias, average ratings as a rating bar UI element with a floating value and the total number of flags it has. From this view the logged in user can view the user’s reviews, products and can barter with the user. The anonymous user is restricted to interact in this activity, he can only view the page’s content. |
| ReviewsActivity |  |
| ReviewsAdapter |  |
| UserProductsActivity |  |
| UserProductsAdapter |  |
| OfferActivity |  |
| ViewImageActivity |  |
| ViewVideoActivity |  |
| AddProductActivity |  |
| LoginActivity |  |
| RegisterActivity |  |
| ForgotPassActivity |  |
| TermsAndConditionsActivity |  |
| AboutActivity |  |
| ContactsActivity |  |
| AccountActivity |  |
| SectionsPagerAdapter |  |
| ProfileFragment |  |
| MyProductsFragment |  |
| MyProductsRecyclerViewAdapter |  |
| ViewMyProductActivity |  |
| OffersFragment |  |
| OffersRecyclerViewAdapter |  |
| ViewOfferActivity |  |
| ReviewsFragment |  |
| ReviewsRecyclerViewAdapter |  |
| ViewReviewActivity |  |

**View Model Classes**

|  |  |
| --- | --- |
| **Class Name** | **Description** |
| ViewModelFactory |  |
| ProductsViewModel |  |
| LoginViewModel |  |
| RegisterViewModel |  |
| ForgotPassViewModel |  |
| MakeOfferViewModel |  |
| AddProductViewModel |  |
| ProfileViewModel |  |
| MyProductsViewModel |  |
| MyOffersViewModel |  |
| ViewOfferViewModel |  |
| MyReviewsViewModel |  |
| ViewReviewViewModel |  |

**Model Classes**

|  |  |
| --- | --- |
| **Class Name** | **Description** |
| AuthentificationModel |  |
| ProductsModel |  |
| OffersModel |  |
| ReviewsModel |  |
| UserProfile |  |
| UserReview |  |
| UserReviewAggregationData |  |
| Offer |  |
| Product |  |
| Response |  |

# **Firebase Design**

## Authentication

## Cloud Firestore

## Cloud Storage

# **Project Implementation**

## Project Structure

## Source Code

# **Marketing Strategy**

# **User Interface**

## Main View

### Select Category Gadgets

### Select Category Clothes

### Select Category Tools

### Select Category Bikes

### Select Category All

## View Selected Product

### Barter for Selected Product

### View Reviews on Selected Product

### View User’s products on Selected item

### View Products’ Photo

### View Products’ Video

## Main Menu Selection

### Sign in Page

### Sign in –Reset Password Page

### Sign up Page

### About Page

### Contact Page

## My Account

### Profile Page – View Profile

### Profile Page – User’s Reviews

### Products – View User’s Products

### Products – View Product

### Offers – View Received Offers

### Offers – View Offer

### Reviews – View User’s Accepted/Rejected Offers

### Reviews – View and Set Review for Accepted/Rejected Offers

## Add Product

//TO DO show both options of adding a product(from menu and from button)

### Add Product Page

### Add Product – Select Category

### Add Product – Select Photo

### Add Product – Select Video

## Add Product

# **Test Documentation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Input** | **Output** | **Result** |
| Start Application | Tap the application’s icon. | The application starts in the main view showing the products under the gadgets category. | Successful |
| Register |  |  |  |
| Sign in |  |  |  |
| Sign Up |  |  |  |
| Sign out |  |  |  |
| About |  |  |  |
| Contact |  |  |  |
| Add Button |  |  |  |
| Categories |  |  |  |
| Add Product |  |  |  |
| Search item |  |  |  |
| Flagg user |  |  |  |
| Rate user |  |  |  |
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# **Appendix:**

# **References:**