Project for CSE471

Title of the Project: Real Estate Portal

Group Number: 05

Group Members:

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Introduction

System Analysis and Design is a process through which a business system can be planned, analyzed, designed, identified system-related problems, solved those and finally implemented system. Systems, processes and technology are the main focused factors in system analysis and design. Before making a real system, first, we need to understand the importance of the system, business value, important features of the system that will make the system easy to navigate, how this system operates etc. and to understand these we need to gain knowledge about system analysis and design properly.

The proper implementation of System Analysis and Design has been carried out in our project “Real Estate Portal” where buyers and sellers can meet and share in a virtual common ground to carry out property business without the hassle of in-person site visits and infamous money transactions scams. Individual sellers or buyers can keep track of their property documents and manage their registration as well as access information and do actions such as adding, amending and removing property details. The portal features safe transactions via agents and affiliated banks. Besides these subscription-based featured advertisements are another core attribute and main source of earning of this particular online portal-based real estate business.

To properly analyze our system, we have identified the business need, business values, requirements of this system and constraints that might be faced during navigating this system. Moreover, we have described our system through different types of diagrams such as Usecase diagram to analyze our requirements, activity diagram to describe the behavior of our system, sequence diagram to show the messages that pass between objects, state machine diagram to depicts the various states that an object might be in, Data flow diagram to depict the movement of data between processes, entities, data storage and finally how windows will be navigated through our system.

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Motivation

Our motivation behind the “Real Estate Portal” - the project was - we wanted a portal to give an existing property company an online home where buyers and sellers will be able to view, buy and sell properties legally while being satisfied by accessing all the online services from the comfort of their home.

To get rid of the traditional offline annoyance of property hunt as well as to reach out to more prospective consumers by the use of digital portals, which provide a quick and easy approach for those who have recently moved to a new location and do not have access to local publishing yet (especially during the ongoing COVID-19 lockdown or pandemic). This eliminates the need for repeated phone calls and trips to the property's location.

Moreover, the existing systems are very simplistic, as they only give basic property information and detail, with no assurance or guarantee of a successful commercial transaction whereas our system includes 3D tours, interactive image galleries as part of the portal's media exploration, property sorting, wishlisting, portal language selection, AD package subscription, integrated loan calculator and verified agent service.

In short, to introduce new features in the field of online real estate portals and to eradicate all the popular dilemmas and insecurities of online property transactions at the commercial level as well as to present a safe and valid way of carrying out online property business we chose the project “Real Estate Portal”.

System Request

Project Sponsor :

CEO - Easy Properties

Business Need :

The project has been initiated to give the existing offline property company an online platform to -

- Get rid of the mainstream offline hassle of property hunt (especially during lockdown /pandemic) which eradicates the need for frequent calls and visits to the site
- Simplify the tasks of buying, selling, and renting properties of the customers via the company
- Reaching more potential customers as digital portals are a quick and easy way of accessing information for individuals who move to a new city and have still no access to local publishing
- Provide assurance of valid and legal transactions while purchasing a property

Business Requirements :

Website features -

- Extensive and up-to-date information property details (Map view, attractive image gallery and 360° video tour of the property, etc.)
- Loan, legal, interior, and property-related consultations service
- Compare between existing properties
- Integrated chat service with an active agent for urgent queries from the customer
- Payment and transactions will be carried through agents

Admins can -

- Add, remove or update property details
- Create, update, delete information from the database.
- Approve requests made by buyers and sellers

Users (Buyer and Seller) can -

- Two-step verification using NID/phone number for improved security
- Edit their personal profile
- Filter, sort, and wishlist properties to buy or to take in rent according to their needs
- Inquiry about specific properties
- Post/edit/remove an advertisement
- Provide feedback regarding the properties, rate other users, and overall service of the portal

Business Values :

Tangible Value -

- The company gets 10% from the transaction made between seller and customer, services (eg. interior service, legal service), and advertising fees
- 5% increase in sales from the annual fare offer/sale to attract more customers
- Reduce onsite property visit cost of the buyer (transportation cost)
- Trimmed down the company cost of extra employees by Tk. 1,20,000 / month as field agents will not be needed anymore to show around the properties to the customers
- Income from featured advertisements (if the client wants to sell his property urgently, he/she can apply for a special advertisement for selling his property which will be showcased on the homepage of the portal): Tk. 30,000 / Month.

Intangible Value -

- Satisfaction of customers.
- Referral of customers.
- Improved customer service.
- Better competitive position compared to offline business systems.
- Administration ease of managing property databases.

Constraints :

- Maintain proper security of the portal via registration of legit customers/verification of users.
- Area-wise portal customization (Dhaka/Chittagong etc.) as customers will be from all over the country.
- To get the approval of various banks for becoming company partners in order to carry out seamless on-demand loan operations for customers
- Collection of on-demand property showcase materials (photos, 360° video tours,s, etc.) from the potential sellers could be challenging.
- To get appreciated and known as a generalized trustful real estate business portal in the country.

Requirement Analysis

Functional Requirements :

1. System

- Three separate log in sections for three separate user bases - Admin, Buyers, and Sellers
- The website landing page will feature a moving advertisements portion which will feature urgent alternating advertisements posted by the sellers
- To make user interaction engaging the website will feature an attractive image gallery and 360° video tour which will be provided by the advertisement poster by default
- Separate global map view section where users can observe the aerial view of their properties
- The website will feature a service section consisting of four subsections - loan, legal, interior, property consultation by which a user can navigate through detailed information of that particular subsection
- The portal will feature a loan calculator on every page where a property advertisement and its description will be shown to assist the customers in the calculation
- The portal will feature an interactive comparison section where a user can select a bunch of property advertisements beforehand and compare them side by side altogether afterward to get an overall idea
- Users will be able to solve their urgent problems and queries via the built-in chat feature of the website where an agent will be present to assist them during the office hours
- To ensure proper money transaction payments will be carried out by an agent in-between buyer and seller outside of the website while keeping an up-to-date receipt on the website's database
- To ensure and monitor end-to-end transactions of paying customers will be able to select from the variety of affiliated partnered banks of the company included on the website

2. User (Buyer and Seller)

- NID Information is a must for signing up. Apart from that, one will need to provide an email address, phone number, and password. One can also register through his Facebook account after providing NID information.
- During sign-up and also after logging in, users can determine whether they would like to receive notifications about promotions, newsletters, and updates about new properties.
- Users can update information on their personal profiles and can determine who can see their personal information.
- Users can provide feedback regarding the properties, rate other users, and the overall service of the portal.
- Can select their preferred language- Bengali or English.

2.1. Buyer

- Can search for available properties using the search bar provided on the homepage. He can also customize his search using his preferred location, price, or any other keyword.
- Can sort the search result based on property features eg. price, size(in sqft), completion status, number of rooms, number of baths, location, floor level, etc.
- Can save his favorite properties to his personal dashboard to view them later at his convenience.
- Can delete properties from their wish list.
- Can inquire about specific properties by using 'Post a comment or 'Send email functions.
- Can get the reply of their inquiry in their email inbox or reply section of their own comment.
- Can call the Hotline number provided for any further information they need.
- Can add request posts to buy a specific type of property.

2.2. Seller

- Can advertise their properties using different advertisement packages.
- If someone wants to sell his property urgently, he can apply for the 'Featured Advertisement' package by paying an extra charge. This type of advertisement will be specially showcased on the homepage of the portal for reaching more potential buyers.
- Can add, delete, update necessary information about their respective properties in exchange for a digital bond /signature(stating that they are providing valid information and legal actions would be taken against them if any information provided by them turns out to be fake) and these requests will be sent to admin for approval.
- Can make a request for deleting, changing the showcase time of their advertisement and for necessary adjustment in the fees. In case of deleting the advertisement, the seller will get his money back but it will include a penalty. This penalty will be calculated based on the time remaining for the actual showcase deadline requested by the seller.

3. Admin

- Admins can approve property details eg. length, size, price, pictures, 360° videos etc of the properties in databases provided by the seller.
- Admins have the authority to approve any kind of advertisement or request post related to buying and selling properties that have been requested by the sellers as well as buyers if they consider those advertisements as a legal and appropriate one.
- For any illegal and inconsistent requests of the advertisement from the buyers and sellers, admins can reject those requests.
- If any buyers or sellers make any urgent requests, admins will check all the necessary information such as payment status for granting the urgent requests, legibility of the advertisement. Then they will approve the requests.
- Admins will receive any kind of advertisement-related emails and comments sent by the buyers and sellers and reply to those emails and comments. They can also delete any inappropriate and irrelevant comments from the website.
- Admins will control the databases of the portal. If any information needs to be changed about the overall portal, only admins have the authority to make those changes in the database. If the users want to add, update or delete any information about their profile, properties, posting advertisements, the admin can approve those requests after screening them properly.

Non-Functional Requirements :

1. Operational

- Each registered user will get a distinctive user ID.
- Every property will have a unique property ID.
- Property ID will be added automatically with the inquiry email made by the buyer.
- Employee management staff will get a notification on new user registrations and the requests made by them.
- The system can be accessed from both computer and portable devices.

2. Performance

- System features compressed yet hard to distinguish, quality property photos and videos to ensure faster load time irrespective of access devices
- In the case of scrolling through the menu, there will be a delay of no more than 1 second before the next page of the portal is displayed.
- The user will be able to load the system within 2 milliseconds.

3. Security

- System features account creation in various methods while keeping NID verification under the hood in every case for ensuring legit customers
- Transaction of money must be carried out by a company agent which eradicates the practice of online scamming
- Personal information of the buyers and sellers will not be provided or used outside of the company
- Data integrity should be maintained if an error occurs or the whole system comes down.

4. Cultural & Political

- Customers can pay the bills for the property advertisements using online banking services provided by the affiliated partner banks or mobile banking services provided by Bkash , Rocket, Upaay or Nogod.
- Customers can use two currencies such as BDT & USD for payment.
- Detailed information about the payment policy should be provided to the customers.

5. Maintainability

- New and old feature integration will be a breeze as the backend of the portal will have built-in version control onboard
- The portal will feature maximum uptime as it will be able to switch in-between multiple servers to avoid the inconvenience of the customers due to server down.
- Advertisements will be updated and any pending advertisements will be added after every 12 hours.

6. Portability

- The portal will be up and usable irrespective of the whole system transferring from one machine to another like Windows to Linux.

7. Usability

- The interface of the software will be easy to use.
- Font, layout, etc. will be designed in such a manner that users will be able to access the portal comfortably from all types of devices.

Usage Scenario

Firstly,the user will try to login into the system using his login credentials.For the valid credentials, users will be able to login into the system successfully. If credentials are invalid, then the user will be asked to sign up into the system. During sign up,the user needs to verify the information he provides.After signing up,the user will be automatically logged in to the system.
A user can use some features which are common to both buyers and sellers .For example ,he can select Bangla or English as system language .He can also provide feedback about the overall portal service,rate properties and other users.Besides, user can view his own profile and make necessary changes if he wants .For example, he can update his profile information, make changes in his notification and security settings .User can end the process here if he wishes.

But if the user wishes to sell his properties, he will be considered as a seller. Sellers can add, delete and update information by providing relevant property information and digital bonds. After that, updated information and bond will be sent to the admin for approval. If the admin approves the property information, then the information will be updated in the system. The system can end here if the seller wants.

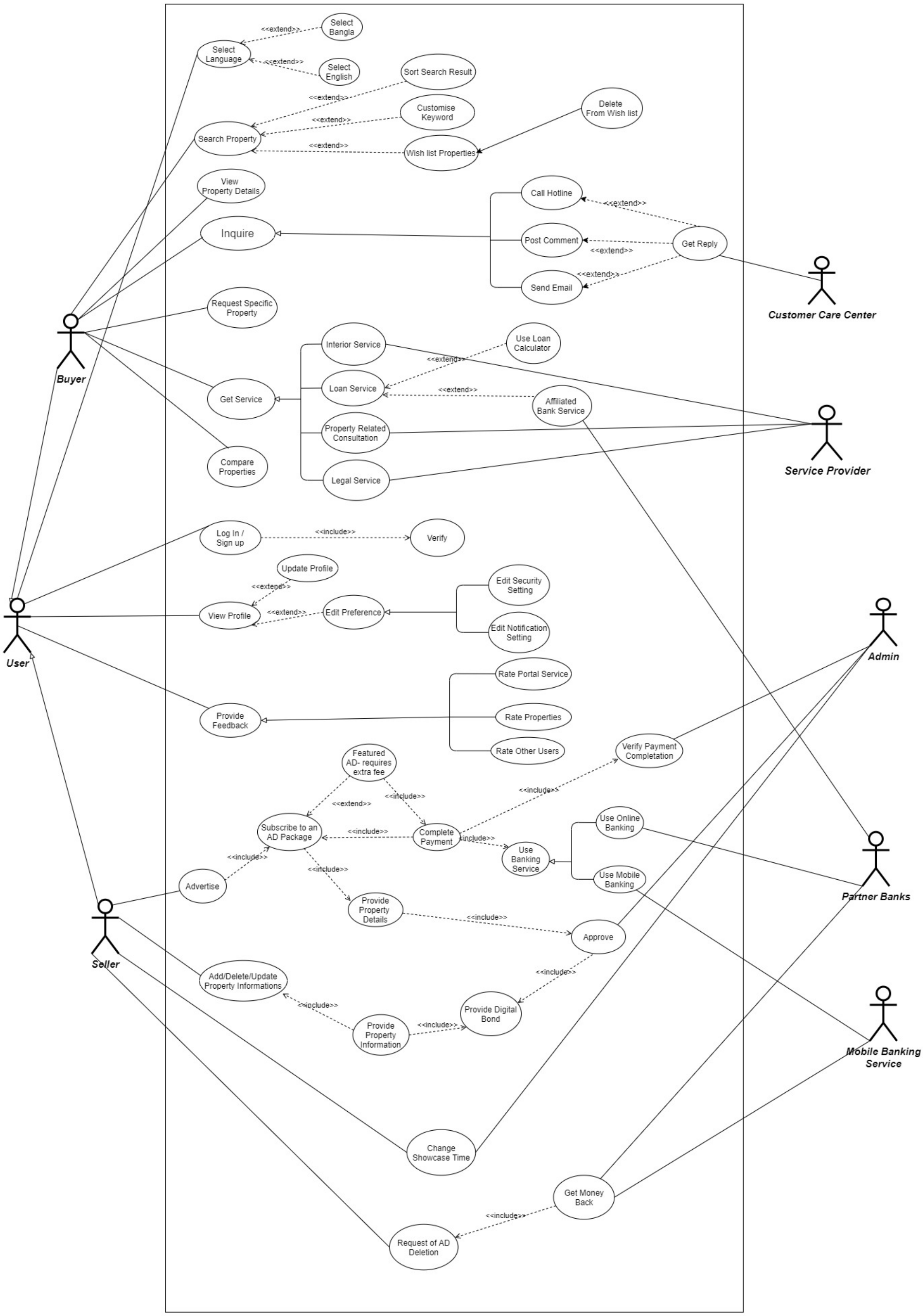
The seller can advertise his properties by subscribing to an advertisement package. If the seller needs to sell his property urgently, he can choose the ‘Featured Advertisement ‘ package which requires him to pay some extra fees. To successfully post an advertisement, the seller needs to provide valid property information as well as fulfill payment using mobile banking or online banking services provided by the partner banks. After the seller is done with payment, the admin will approve the successful completion of payment, and then the advertisement will be published into the system and after this, the seller can exit the system if he wishes.

The seller can also change the showcase time of his advertisement by providing a new showcase time which will be approved by the admin. After getting approval from the admin, a new showcase time will be applied to his advertisement. The seller can also request the deletion of his advertisement. When the request has been approved by the admin, the seller will get his money back with some penalty adjusted with it based on the time the advertisement deletion request was made and then the advertisement will be deleted from the system. At this point, after deleting or updating advertisements’ information, the seller may end the process if he desires.

If the user wishes to buy properties, he will be considered as a buyer. The buyer can use the search function of the system to look for his desire property. If he is not able to find any property he wished to buy, he can request for the specific property type and then end the process after that.

.If the buyer finds the properties he was looking for in the search result, he can sort the search result for a better view and more efficient searching. He can also compare between two specific properties. Moreover, he can wishlist his favourite properties.If he is interested in a specific property, he can see detailed information about it by clicking on ‘View property’.If the potential buyer is not satisfied with the details, he can inquire for additional information by posting comments, sending an email, or calling the hotline number. He can get replies to his inquiries from the customer care service. If he is satisfied with the property information, he can book the property for buying and end the process at that point
.In addition to buying properties, buyers can get different services for example interior service,property-related consultation services offered by the portal. He can also calculate loan details using the loan calculator. He can also get loans from the affiliated partner banks. After using this service he can also exit the system if he wants to.

Use Case Diagram



[Diagram available at - Use Case Diagram (Use G-Suite)]

User Activity Diagram With Swimlane

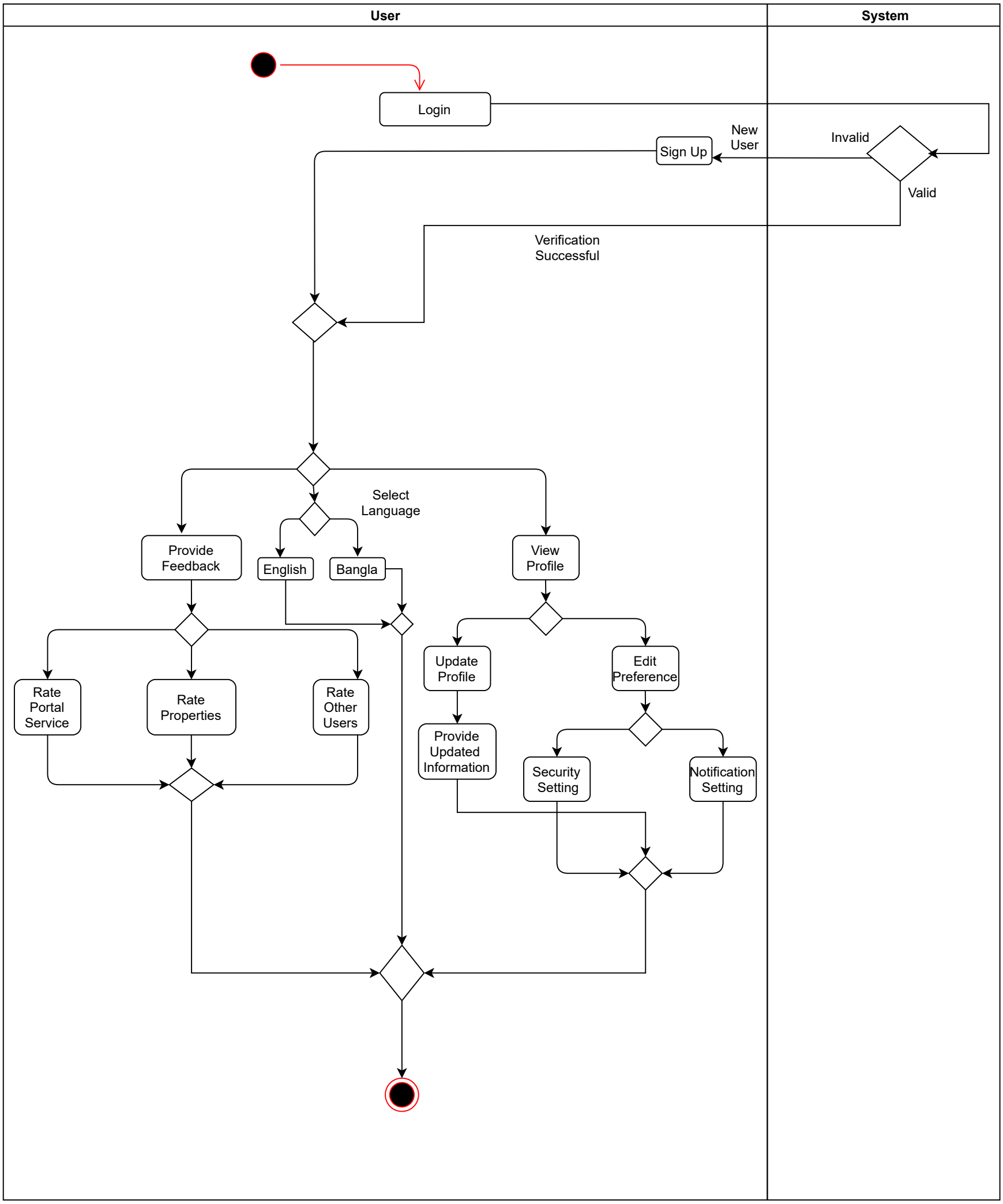
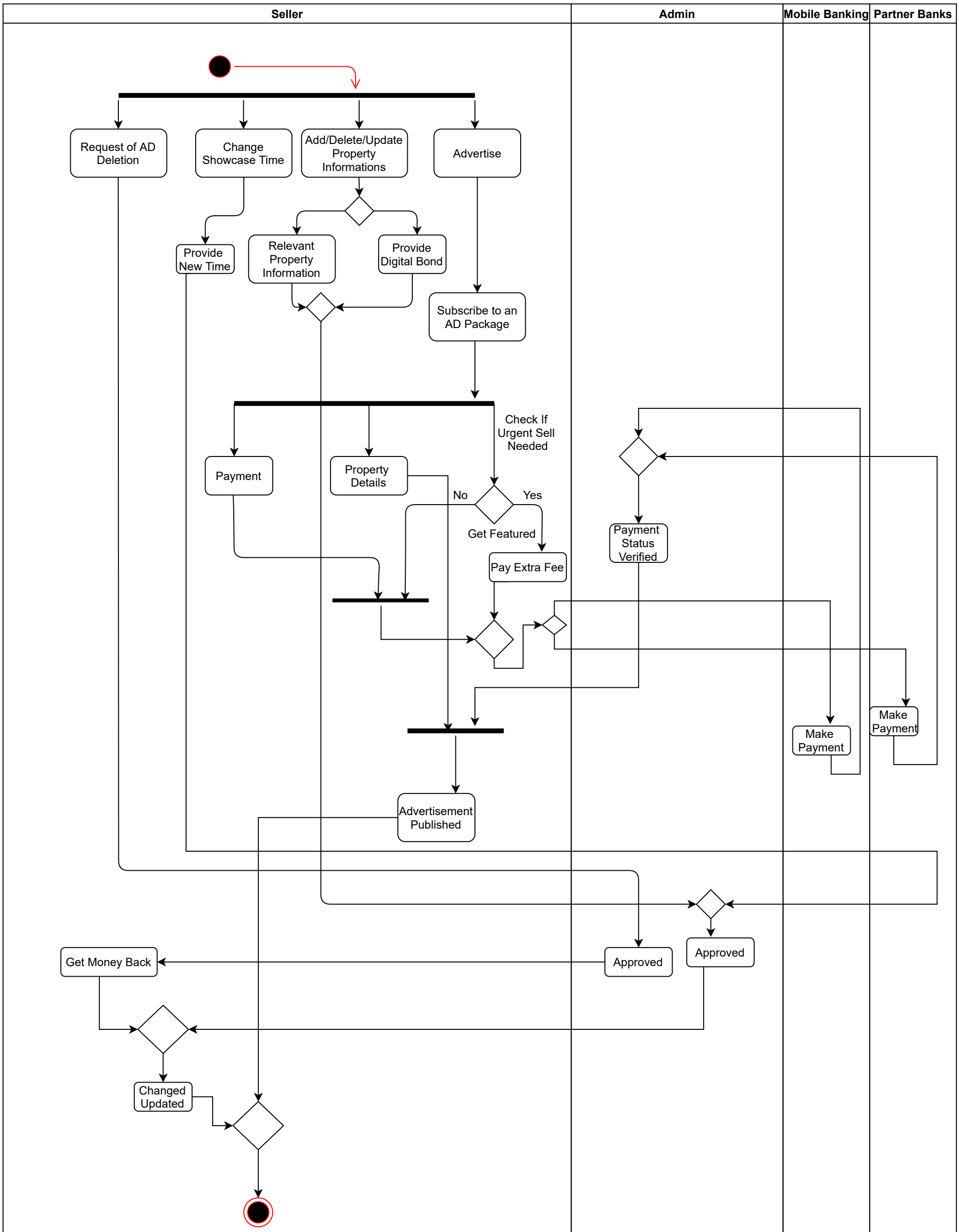


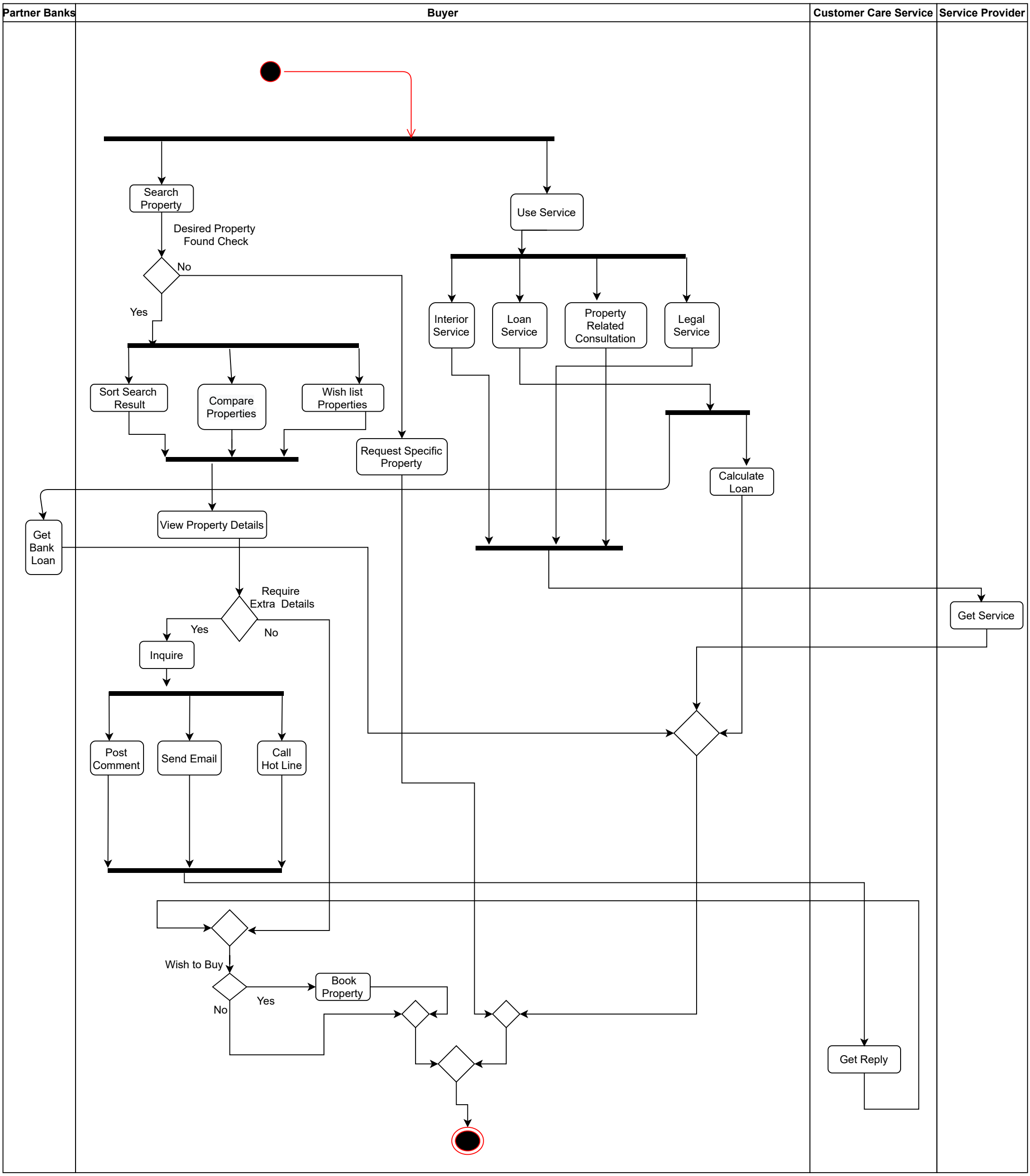
Diagram available at - User Activity Diagram with Swimlane (Use G-Suite)

Seller Activity Diagram With Swimlane



[Diagram available at - Seller Activity Diagram with Swim lane (Use G-Suite)]

Buyer Activity Diagram With Swimlane



[Diagram available at - Buyer Activity Diagram with Swimlane (Use G-Suite)]

User Sequence Diagram

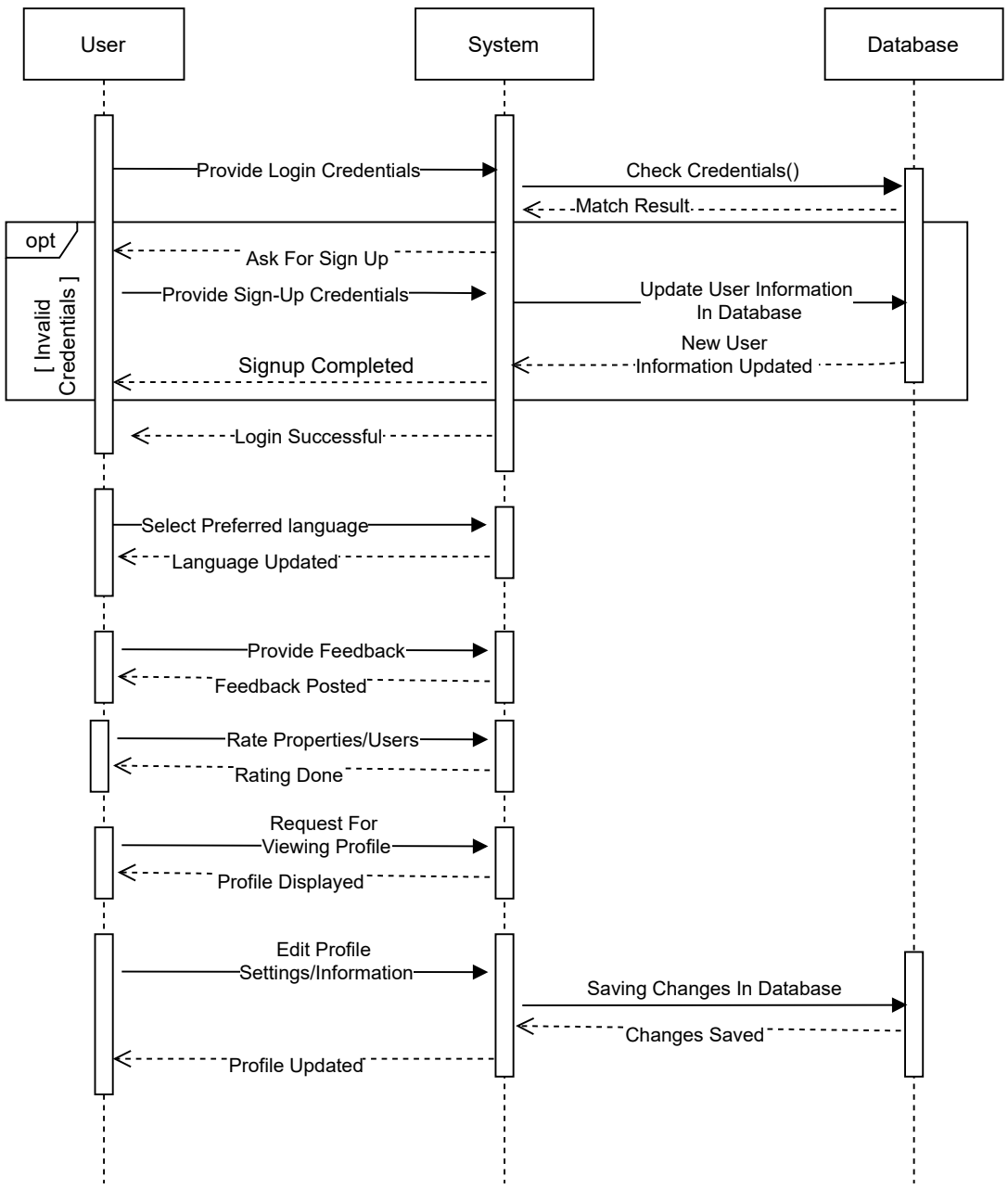
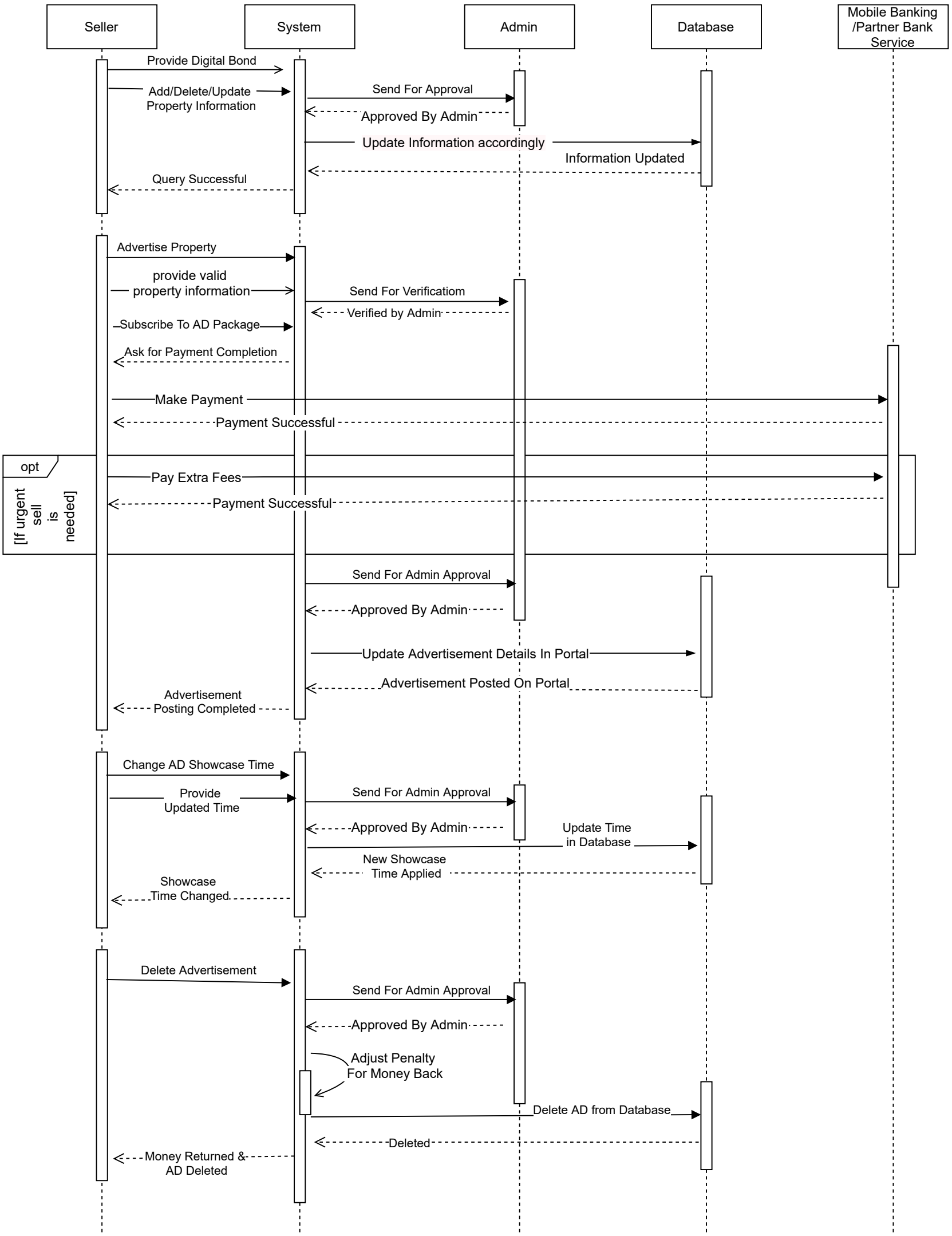


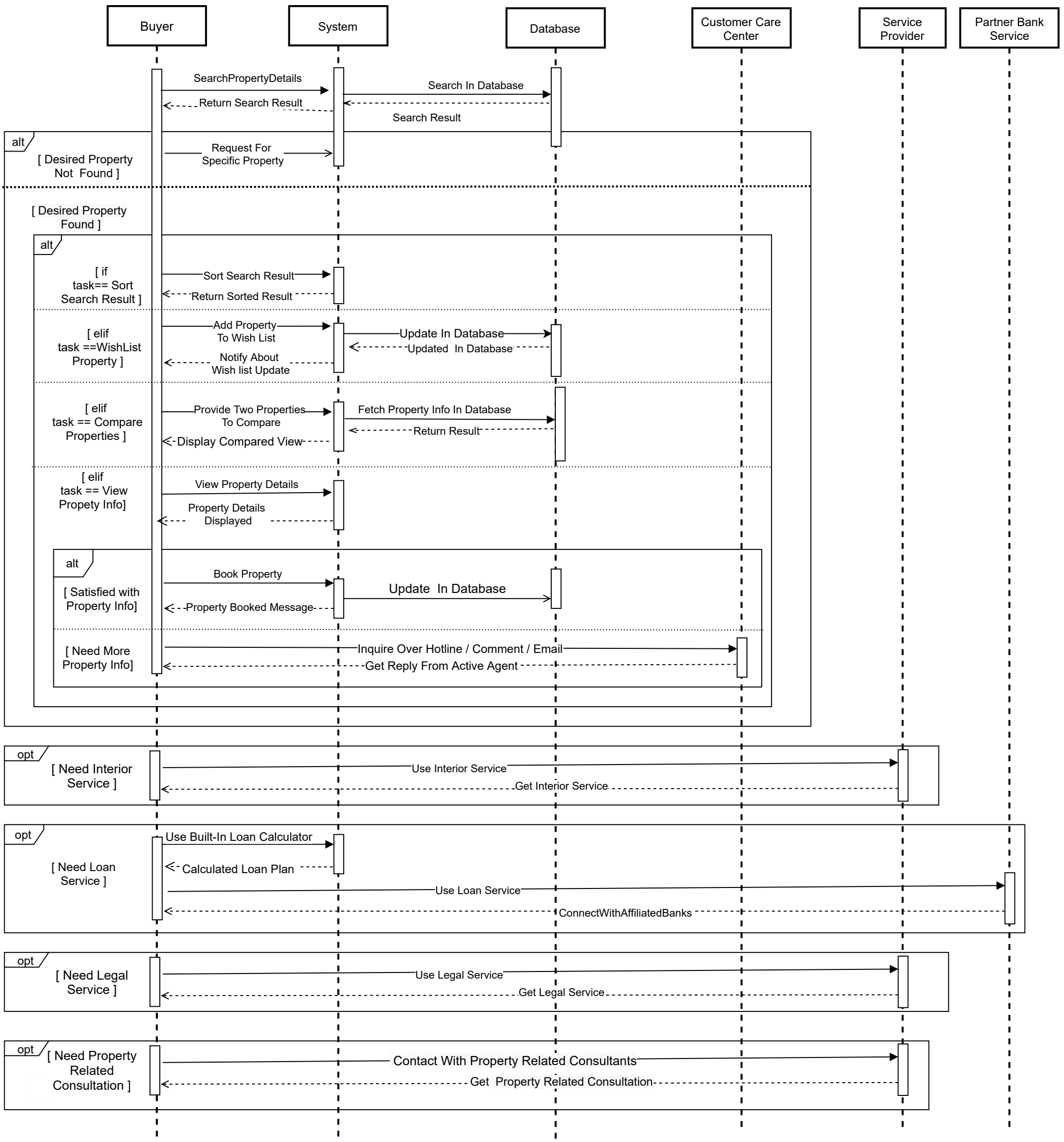
Diagram available at - User Sequence Diagram (Use G-Suite)

Seller Sequence Diagram



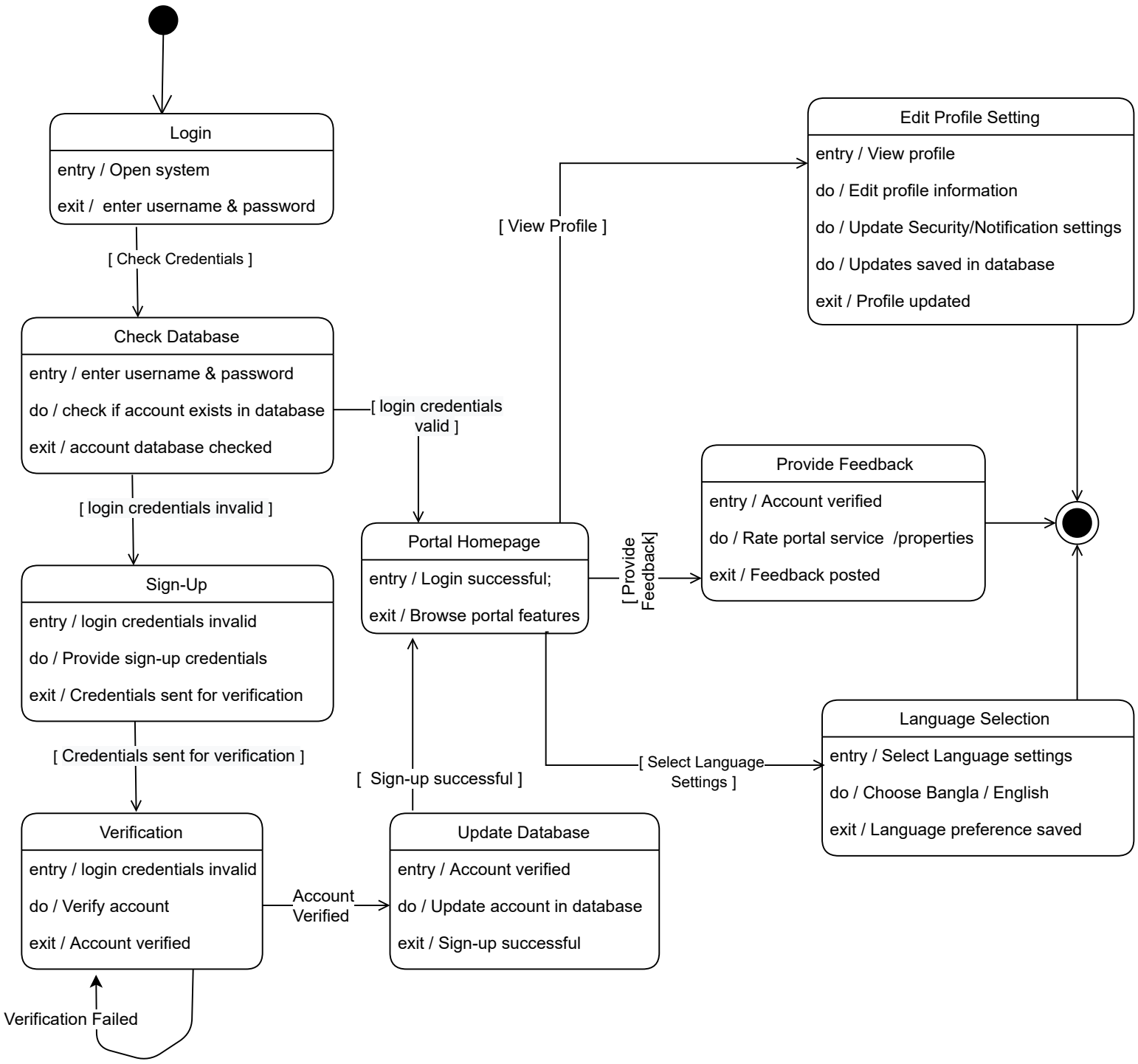
[Diagram available at - Seller Sequence Diagram (Use G-Suite)]

Buyer Sequence Diagram



[Diagram available at - BUYER Sequence Diagram(Use G-Suite)]

User State Machine Diagram



[Diagram available at - User State Machine Diagram (Use G-Suite)]

Seller State Machine Diagram

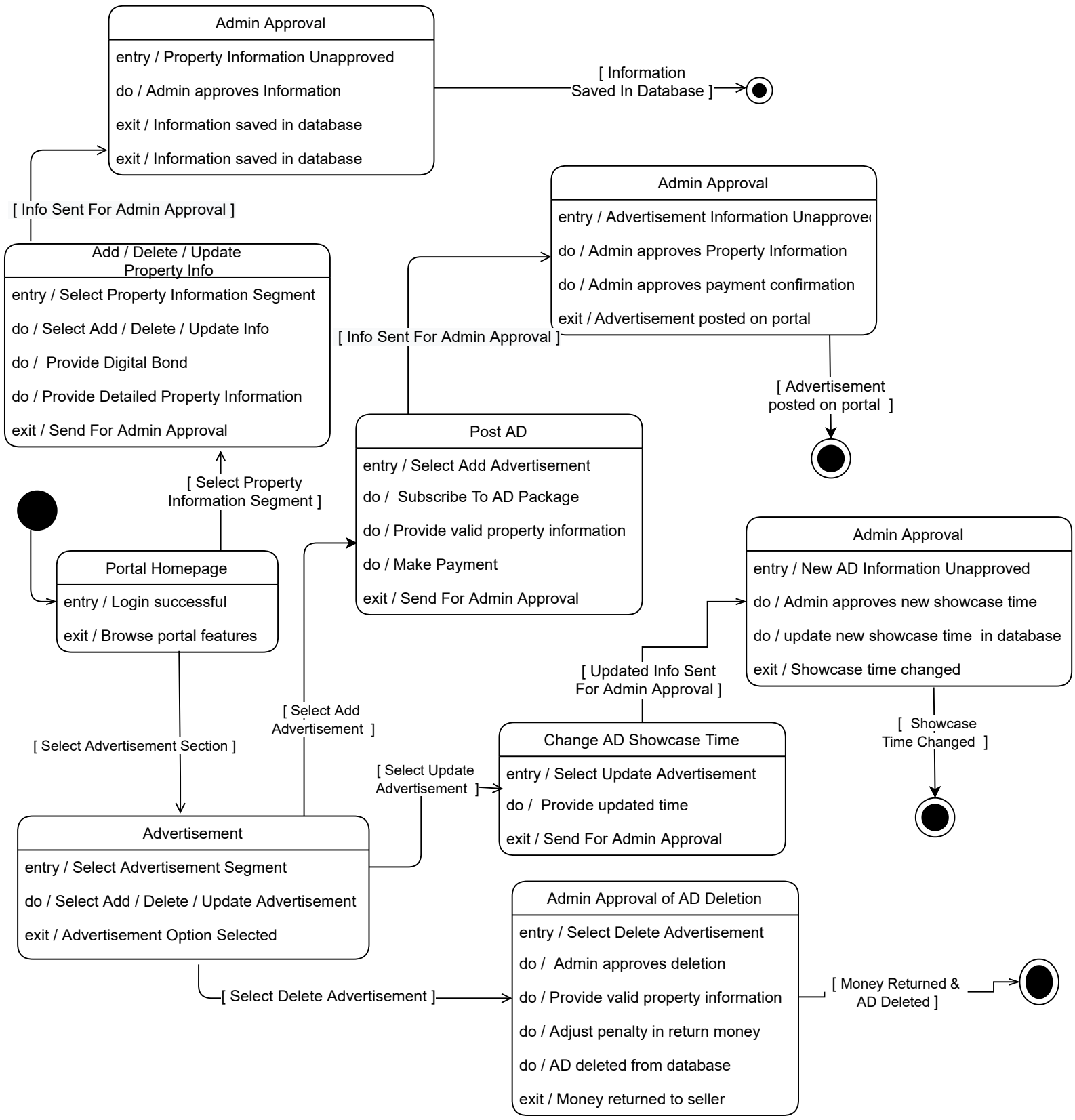


Diagram available at - Seller State Machine Diagram (Use G-Suite)

Buyer State Machine Diagram

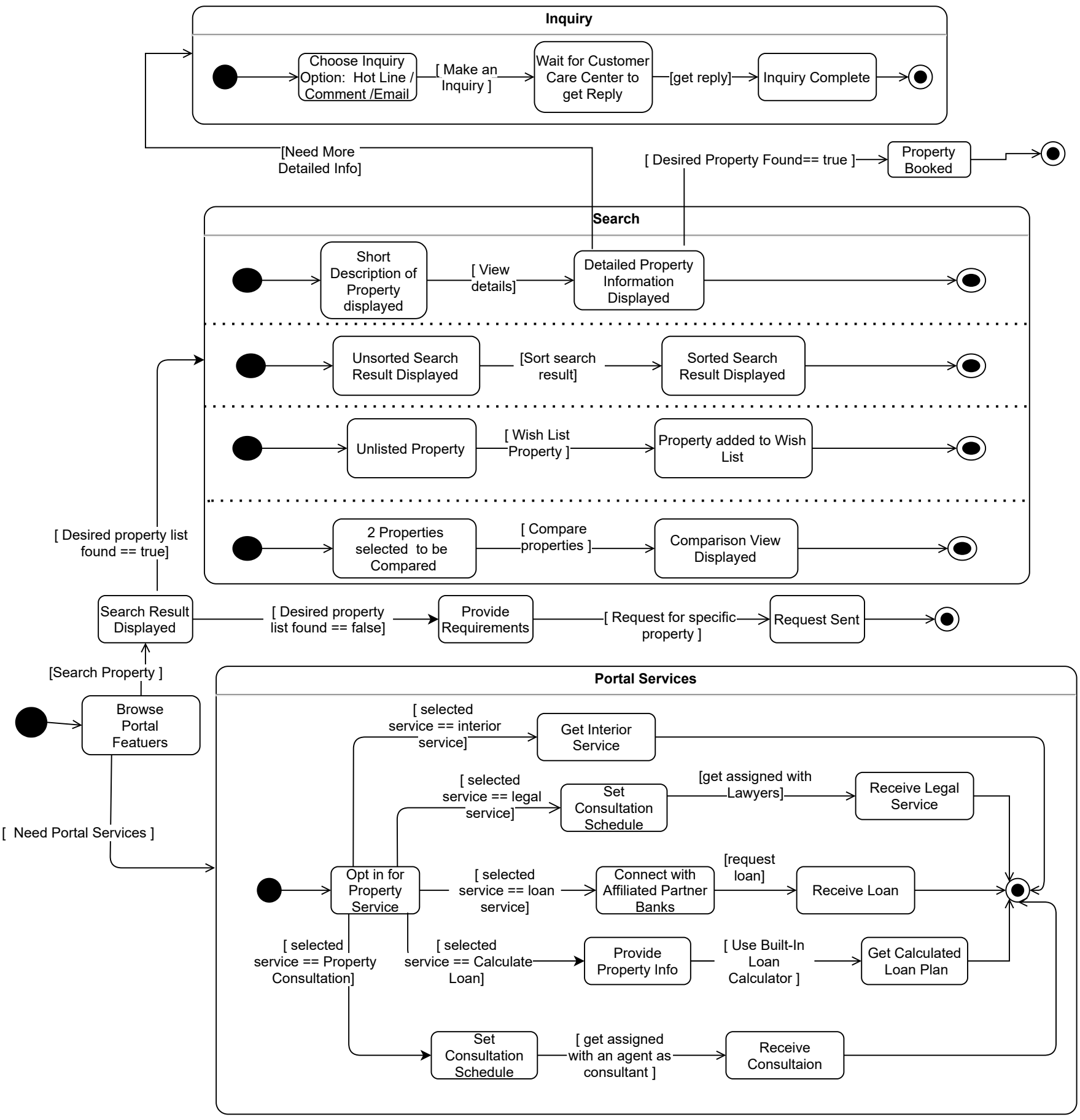
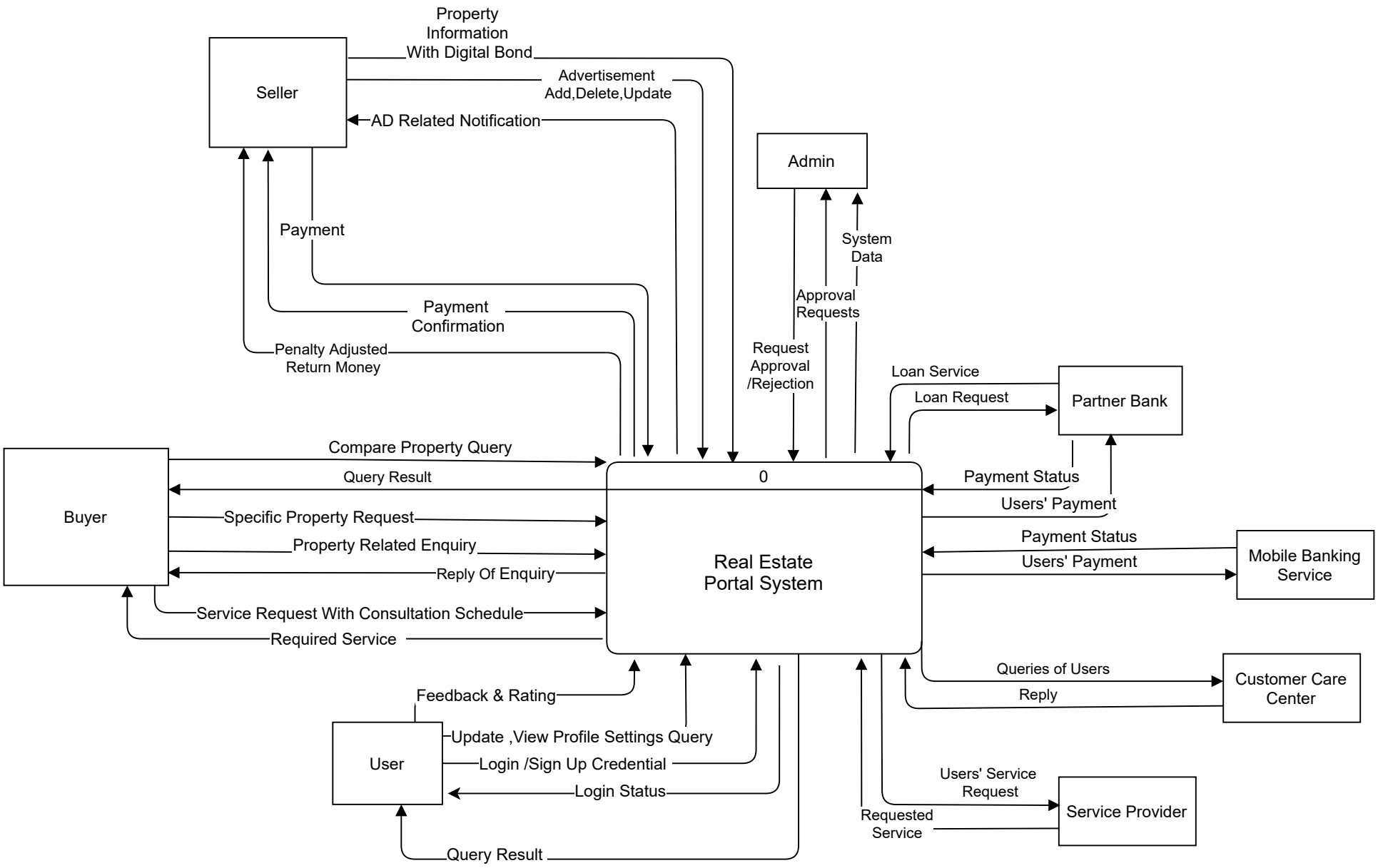


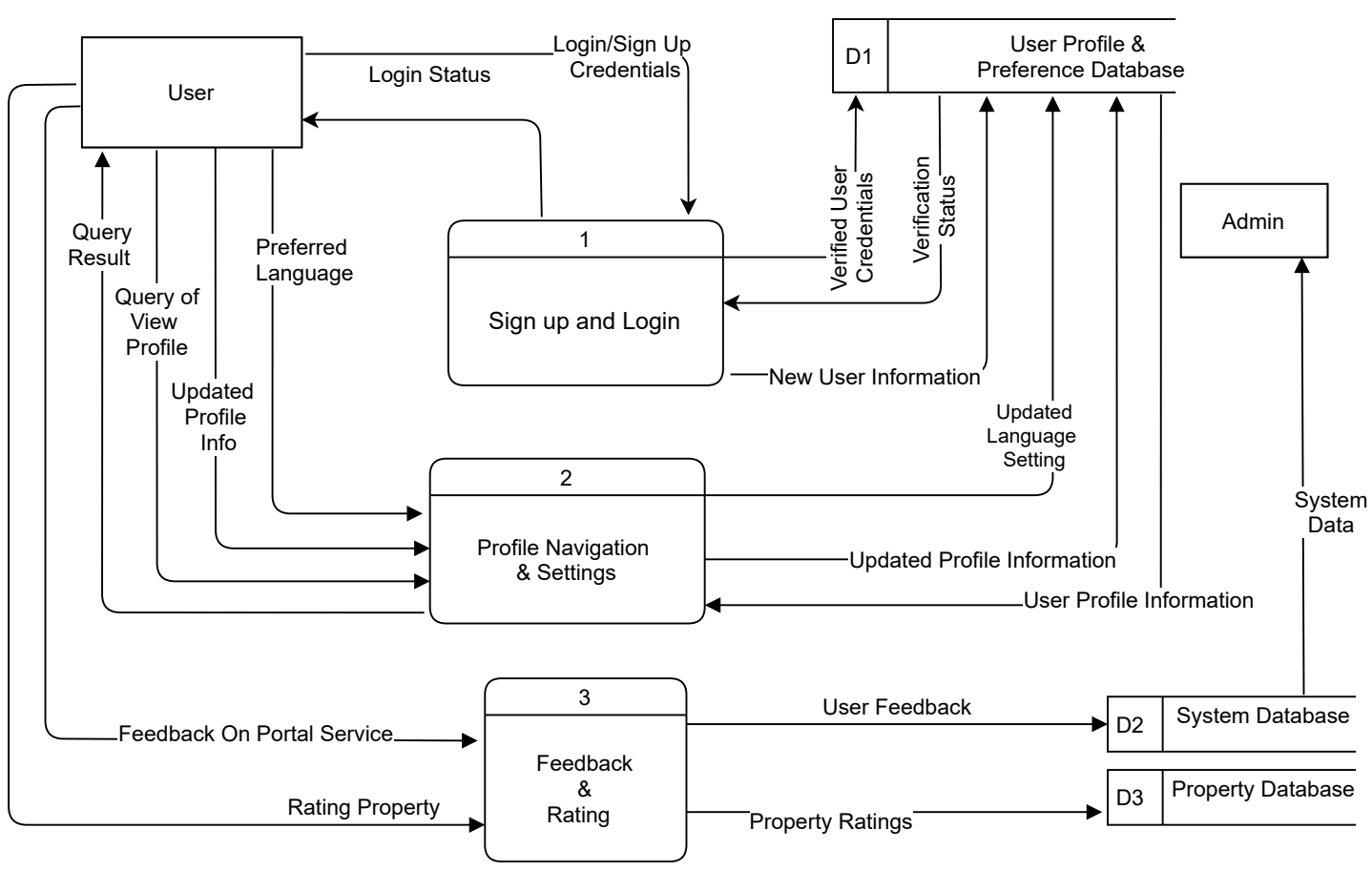
Diagram available at - Buyer State Machine Diagram (Use G-Suite)

Level 0 DFD



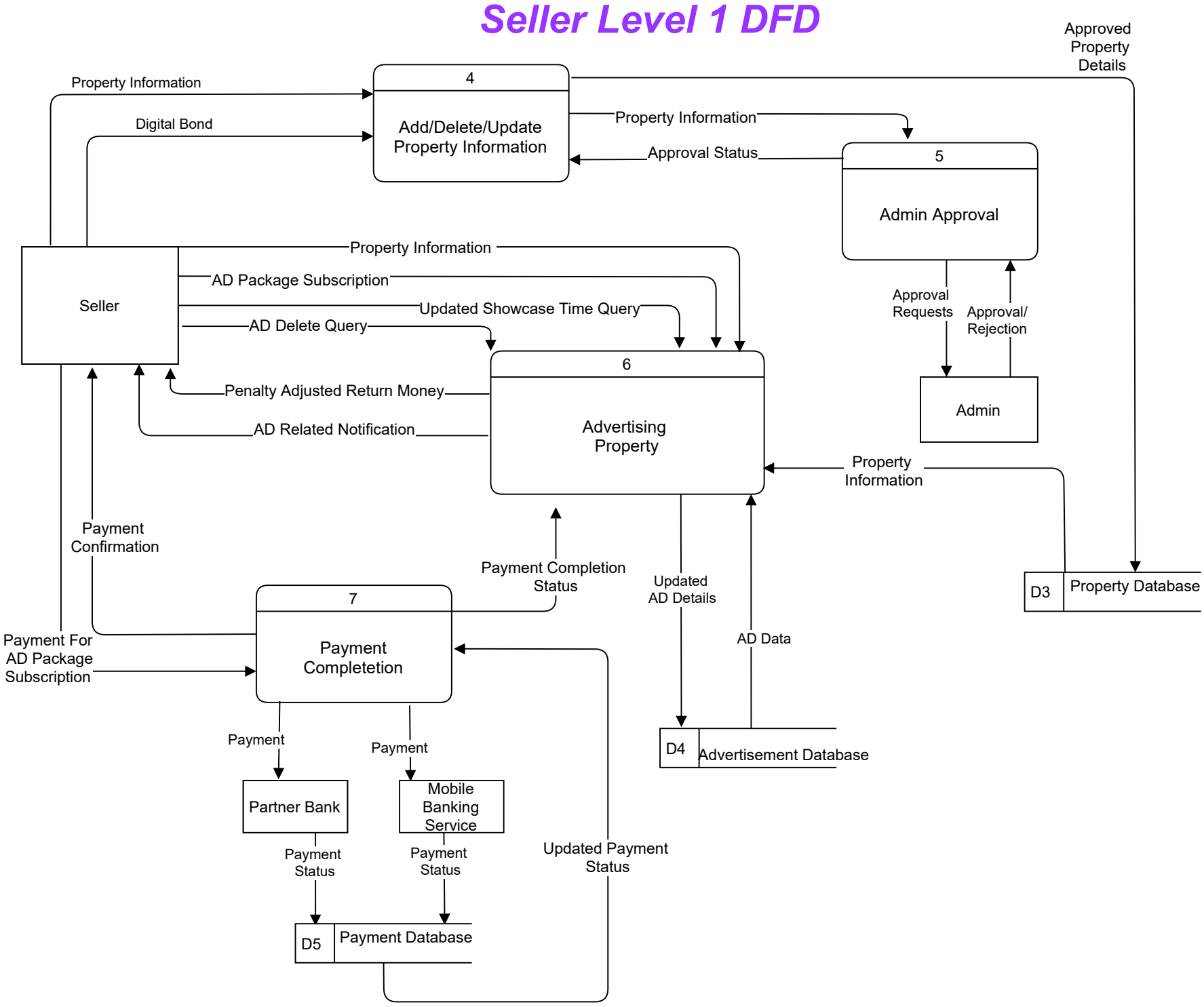
[Diagram available at - L0 DFD (Use G-Suite)]

User Level 1 DFD



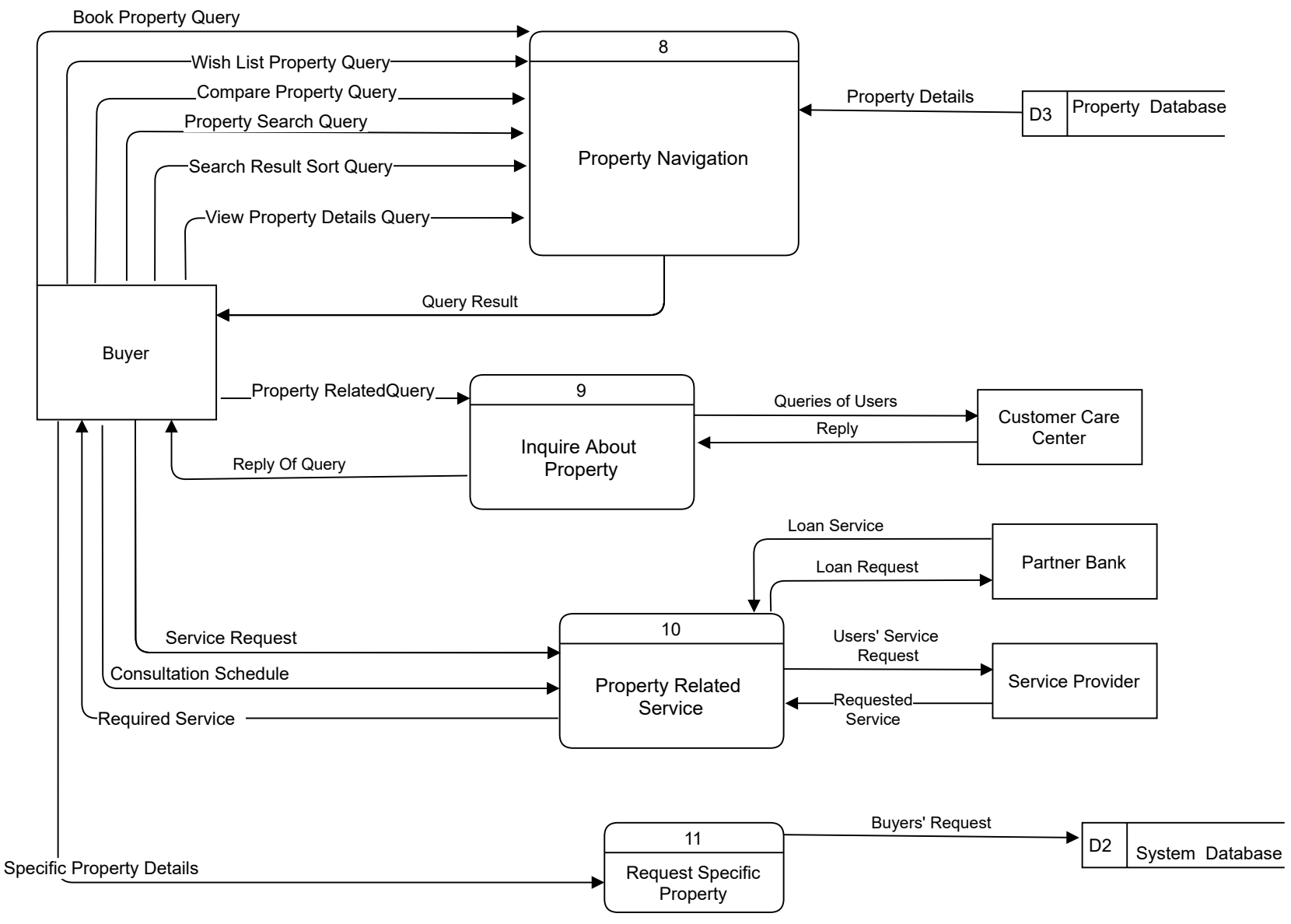
[Diagram available at - L1 User DFD (Use G-Suite)]

Seller Level 1 DFD



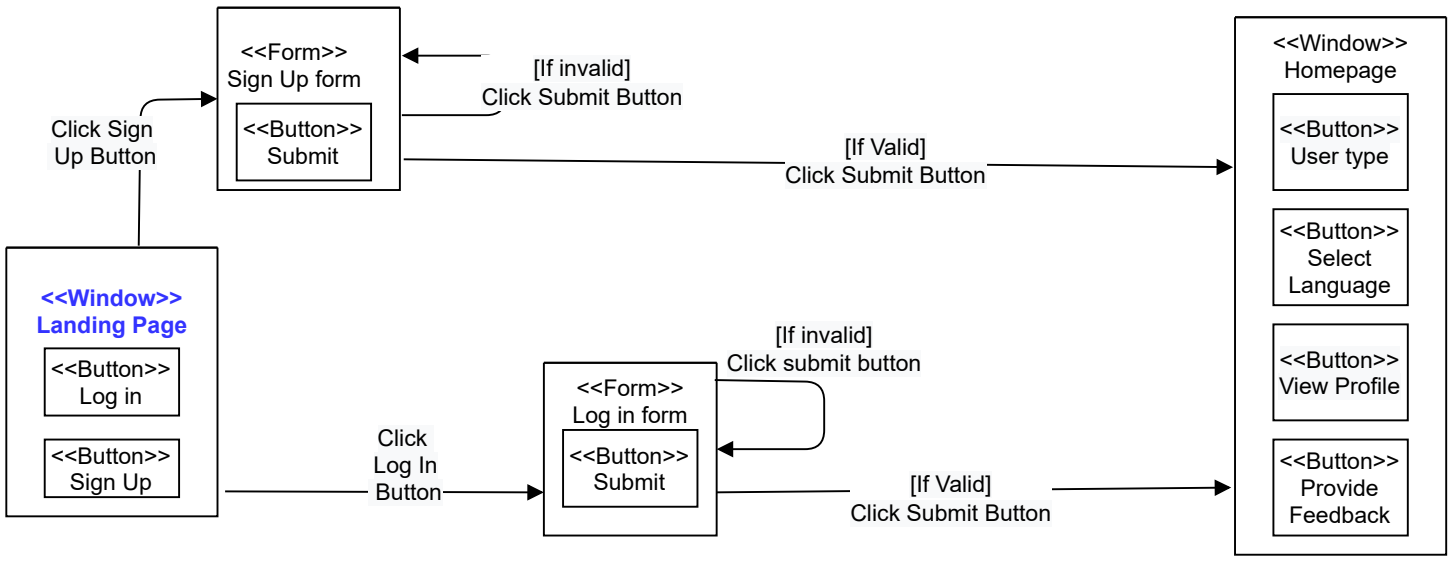
[Diagram available at - L1 Seller DFD (Use G-Suite)]

Buyer Level 1 DFD

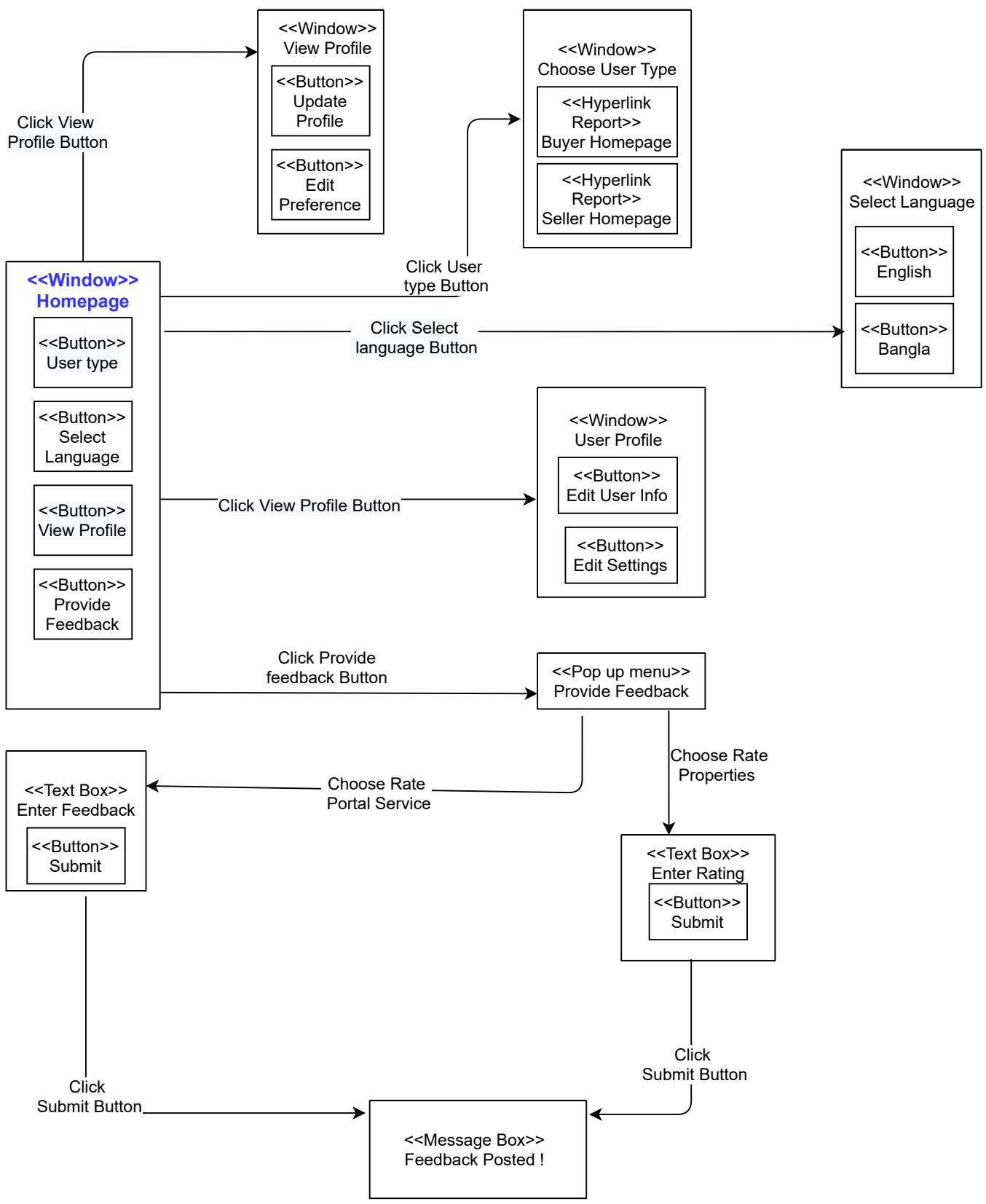


[Diagram available at - L1 Buyer DFD (Use G-Suite)]

Log-in/Sign-up Page WND



Homepage WND



[Diagram available at - User WND (Use G-Suite)]

Seller Homepage WND

<<Window>>
Seller Homepage

<<Button>>
Edit Property Information

<<Button>>
Advertise Property

Click Edit Property Information Button

<<Window>>
Edit Property Information

<<Button>>
Add New Property Information

<<Button>>
Update Property Information

<<Button>>
Delete Property Information

Click Add New Property Information Button

<<Window>>
Add Property Information

<<TextBox>>
Enter Property Information

<<Button>>
Submit

<<Form>>
Upload Property Related Document

<<Button>>
Submit

<<TextBox>>
Enter Digital Bond

<<Button>>
Submit

Click Submit Button

<<Msg Box>>
Property Details Sent For Admin Approval

Click Delete Property Information Button

<<Window>>
Delete Property Information

<<TextBox>>
Enter Property ID

<<Button>>
Submit

<<TextBox>>
Enter Digital Bond

<<Button>>
Submit

Click Submit Button

<<Msg Box>>
Property Information Deleted

Click Update Property Information Button

<<Window>>
Update Property Information

<<TextBox>>
Enter Property ID

<<Button>>
Submit

<<TextBox>>
Enter Updated Property Information

<<Button>>
Submit

<<Form>>
Upload Updated Property Related Document

<<Button>>
Submit

<<TextBox>>
Enter Digital Bond

<<Button>>
Submit

Click Submit Button

<<Msg Box>>
Property Details Sent For Admin Approval

Click Advertise Property Button

<<Window>>
AD Options

<<Button>>
Post New AD

<<Button>>
Update Showcase Time

<<Button>>
Delete AD

Click Post New AD Button

Choose Featured Advertisement Package

<<Pop Up Menu>>
Choose AD Package

Choose Regular Package

<<Pop Up Menu>>
Choose Payment Option

Choose Mobile Banking

Choose Online Banking

<<Pop Up Menu>>
Enter Advertisement Information

<<TextBox>>
Enter Property ID

<<Button>>
Submit

<<TextBox>>
Enter Transaction ID

<<Button>>
Submit

Click Submit Button

<<Msg Box>>
Advertisement Request Sent For Approval

Click Update Property Information Button

<<Window>>
Update Property Information

<<TextBox>>
Enter Advertisment ID

<<Button>>
Submit

<<TextBox>>
Enter Updated Showcase Time

<<Button>>
Submit

Click Submit Button

<<Msg Box>>
New Showcase Time Sent For Approval

Click Delete Property Information Button

<<Window>>
Update Property Information

<<TextBox>>
Enter Advertisment ID

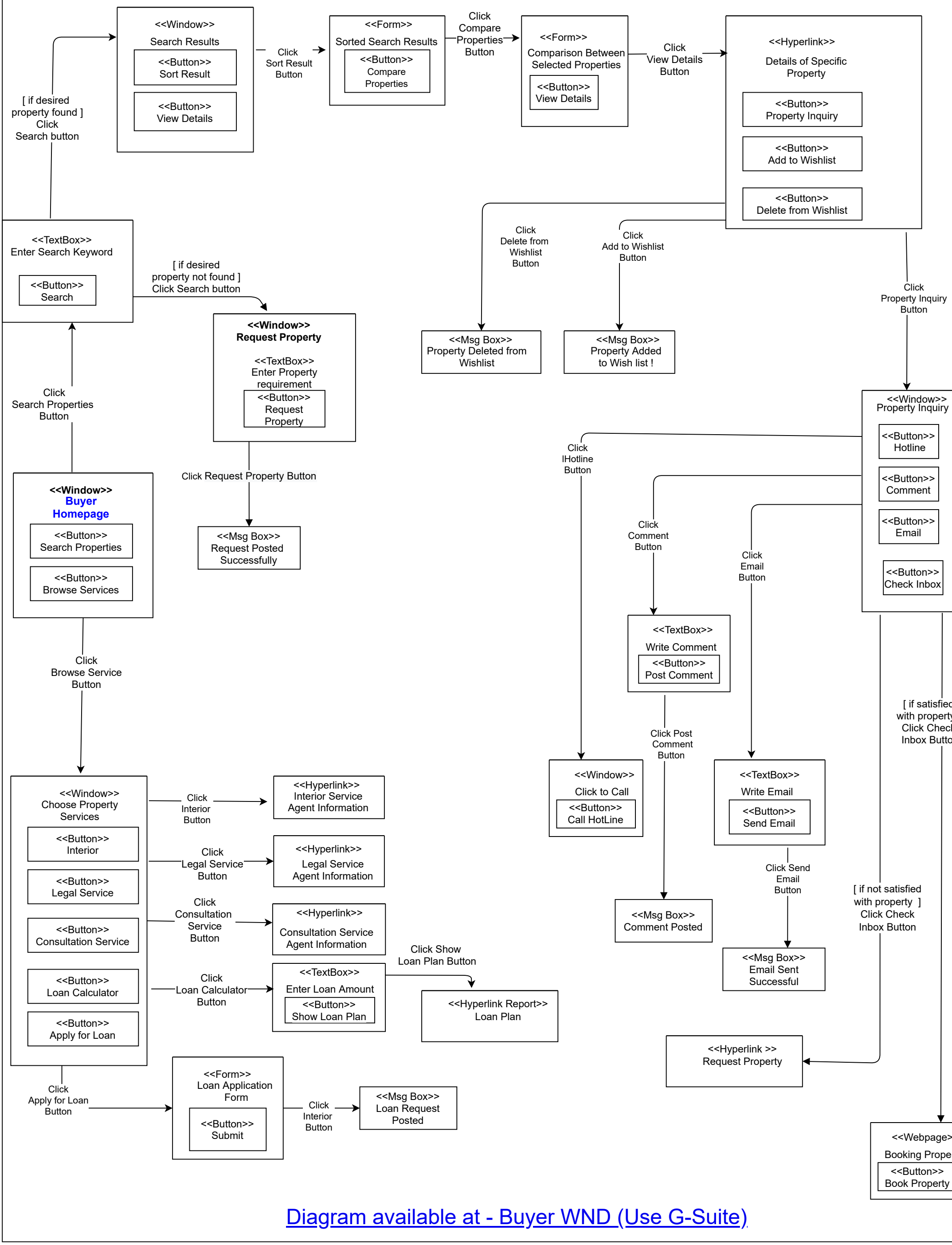
<<Button>>
Submit

Click Submit Button

<<Msg Box>>
Notification of Money Back & AD Deletion

[Diagram available at - Seller WND (Use G-Suite)]

Buyer Homepage WND



[Diagram available at - Buyer WND (Use G-Suite)]

Conclusion

The design and analysis of the Real Estate Portal were carried out in different segments like Use Case Diagram, Activity Diagram, Sequence Diagram, State Machine Diagram, Data Flow Diagram (Context and Level 1), and Windows Navigation Diagram. These diagrams will help a company owner like ours to understand the basic features and needs of why he/she should choose and invest in developing our project in order to make the online property business more appealing and engaging for the ever-growing property market of Bangladesh. This will also ensure that we will be able to provide and add more features into our portal via constant trial errors and feedback from users as we move on while keeping the structure of the portal simple and intuitive by following the available system analysis and design diagram as a base or map. All these will make a company who are willing to deploy our Real Estate portal to grow their business and increase their revenue while the end-users or the customers will be satisfied by using our portal as well.