Title of the Project: Railway Booking and Tracking System

Group Number: 13

Group Members:

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Introduction:

System analysis is defined as a procedure of accumulating and comprehending facts, distinguishing the problems, and fragmenting a system into its ingredients. It is typically conducted for the purpose of investigating a system or its sections in order to locate its objectives. It is a problem-solving approach that revamps the system and certifies that all the elements of the system are coherent to execute their initiative. Furthermore, it is an undertaking of designing a new business system or replacing an existing system by illustrating its modules to appease certain requirements. Moreover, prior to proposing, one needs to acknowledge the former system thoroughly and regulate how to oversee efficiently. We, members of group 13, have chosen “Railway Booking and Tracking System" as our system analysis and design project to fabricate a preferable strategy of allocation of train tickets and a refined routing system.

Motivation:

Often, we discover people contemplating railways as the least preferred way of transportation. This occurs mainly because of the lack of a conventional mechanism of distributing tickets to customers. Even the current online-based platform is less user friendly. In addition to that, tracking a train’s current location and its expedition is quite favorable to the public as it may lessen their hassle to catch specific trains. Present analog system of tracking is inadequate for numerous pretexts. Therefore, to alleviate these contemporary affairs, we thought of forging a system that can mitigate these issues in present times and also in near future.

System Request:

Project Sponsor: Muhtasim Fuad Ayon, Rezvi Ahmed

Business Need:

This project was initiated to help the customers in need of railway ticket supply while creating a new revenue source for our organization. This project will help to deliver the much-needed railway tickets of the customers quickly without going outside with a tip of finger. Moreover, this project will also give priority according to the customers requirement but will also gain benefits from the customers as well as the central railway department associated with this project.

Business Requirement:

Using this system over the physically located ticket counter, customers will be able to search for and purchase the preferred ticket from the comfort of their homes. The specific functionality that the system should have includes the following:

➢ Search for tickets in our digital ticket catalogue.

➢ Learn about the price and other information before purchasing.

➢ Pay the bill through either cash on delivery or credit card or bkash.

➢ Emergency ticket purchasing.

➢ Establish a customer subscription account permitting discounts and loyalty rewards.

➢ Provides opportunity for the routes of railways that are in loss.

Business Value:

We expect that by developing this website we will be providing an easy-to-use platform for the railway employees to sell their tickets and for customers to buy from. We expect a new revenue stream from the railways via commission and other fees.

Some notable tangible and intangible benefits include-

➢ $500,000 increase in revenue from commissions.

➢ $700,000 increase in revenue from our payment system usage.

➢ $200,000 increase in revenue from seller’s ad promotion fees.

➢ 30% increase in market share.

➢ Customer ease of buying.

➢ Increase in sales of railway tickets.

Special Issues or Constraints:

➢ The tickets which will be sold to the customers will be cautiously monitored and if need any change, a digital money receipt will be given to ensure safe transaction.

➢ It will be very carefully monitored not only by a physical person but also with computers to make sure the necessary information in the tickets is authentic.

➢ Since the situation in the railway department is not so good and also there is Metro Rail project going on in Dhaka city. To bring the emerging sector back, the project needs to be completed as soon as possible.

Requirement Analysis:

For a system to be operational and up and running, there are some necessities that need to be fulfilled adequately. There are mainly two requirements which are described thoroughly below –

Functional Requirements:

Two types of user will interact with the system.

1.Ticket Seller:

1.1 Sellers can create their profile by giving necessary information. For example: Train Name, Ticket type, Trade license no, Physical address, phone no etc.

1.2 Seller can upload pictures of the AC and Non AC seats.

1.3 Sellers have access to increase or decrease ticket prices.

1.4 System will contain a list of available trains.

1.5 System will show available routes to the users.

1.6 System will provide the users various ways to pay their ticket bills.

1.7 Admin will be able to forward necessary details to the next station.

1.8 Admin will be able to enter train departure time.

2. Customer:

2.1 Customers can create their profile by giving their name, phone number and address.

2.2 Limit every account that can not use more than 3 persons.

2.3 Users can observe real-time train schedules.

2.4 Customers who have premium membership, can get extra facilities.

2.5 System can calculate charges and show it to the customer.

2.6 The system can retain customers' order history for six months. 2.7 Customers can cancel their orders within 24 hours.

Non-Functional Requirements:

1. Operational:

1.1 The system will support varied electronic devices

1.2 Android, Windows and Apple users can access the system from any supported device.

2. Performance:

2.1 The system will be refreshed every 30 minutes.

2.2 The train departure and timings list will be updated

2.3 System will refresh according to the user’s needs.

3. Security:

3.1 Two factor Authentication will be available for the users to secure their account and other details.

3.2 A code will auto-generate from the system and will be sent to the user.

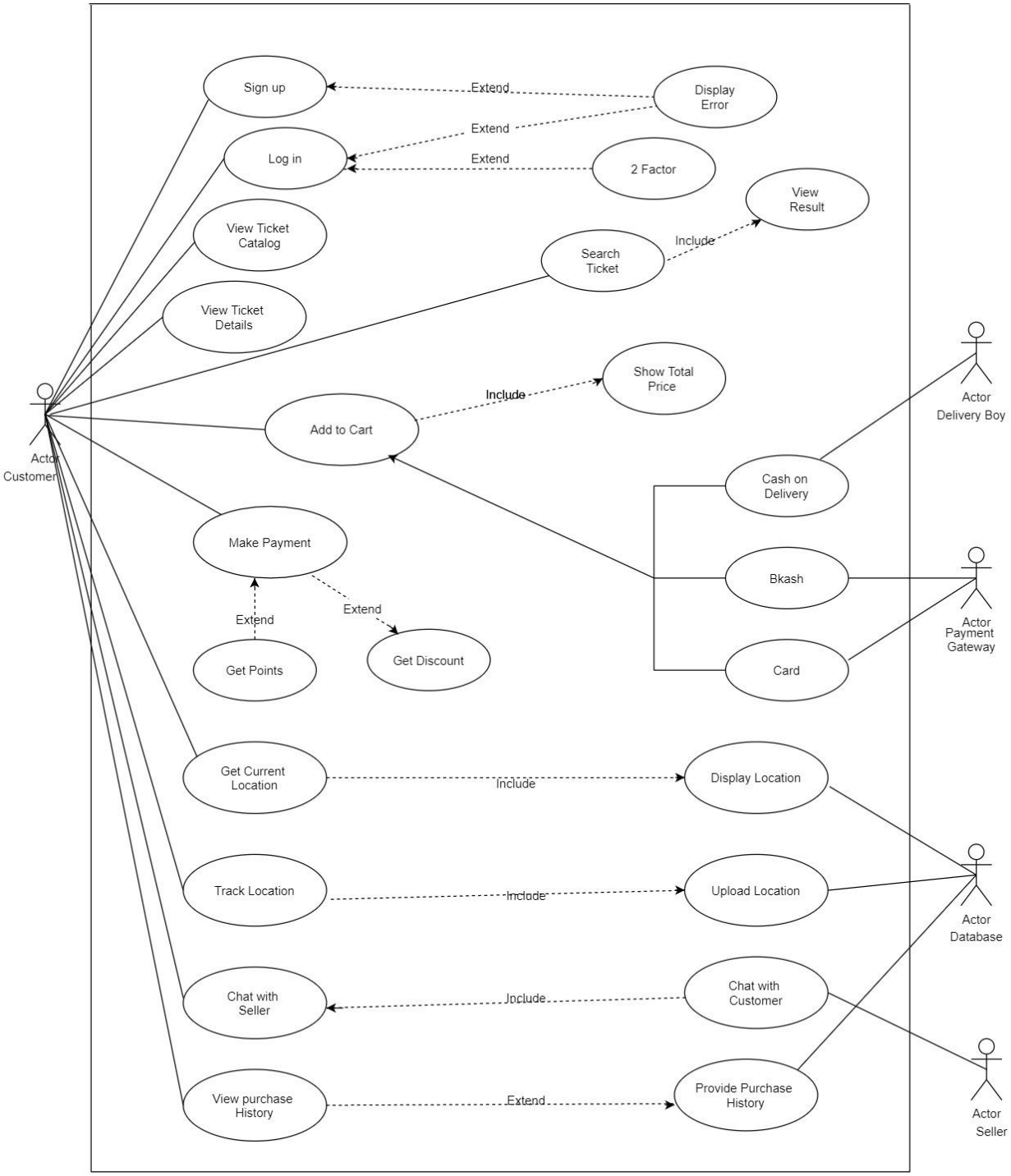
3.3 An email/message will be sent automatically from the system if the account is verified successfully.

4. Cultural & Political:

4.1 The system will follow the Data Protection Act of Bangladesh.

4.2 The system will have its own policy structured following all the legality instructed by the Bangladesh Government.

Use Case Diagram



Priority:

Priority of the system can be categorized into four parts -

1. Customer (Higher)
2. Ticket Seller (Less than customer)
3. Application (Less than seller)
4. Authentication (Least)

Actor:

a) Primary- Customer/Passenger

b) Secondary - Ticket Seller

c) External Hardware - Ticket Selling and Booking Application, Data Centers.

d) Another System - Two Factor Authentication from Google.Inc

Description: The above-mentioned system has some unique features and attributes which define the system in a systematic way. There are actors, actions, conditions of actions, flow of various steps etc. The process mainly starts from the customers ordering/buying a ticket through the booking application where a ticket seller is available at certain times to process the ticket booking/buying requests. The application can be connected with any third-party software/application to authenticate a user's request. From the beginning of the process, the necessary actors must perform their designated tasks to complete the process properly.

Trigger: a. External - Book a ticket, search for a ticket, get reward points.

b. Temporal - Make payment, add to cart

Preconditions: 1. Make payment->Get Reward Points->Discount from reward points

2. Sign up->Display error

Normal flow of steps:

1. Sign Up
2. Login
3. Ticket Catalog
4. Search Ticket
5. View result
6. View Ticket Details
7. Add to Cart
8. Total Price
9. Make payment
10. Track Location
11. Display Current Location
12. Chat with seller

Postconditions: 1. Search ticket->View result

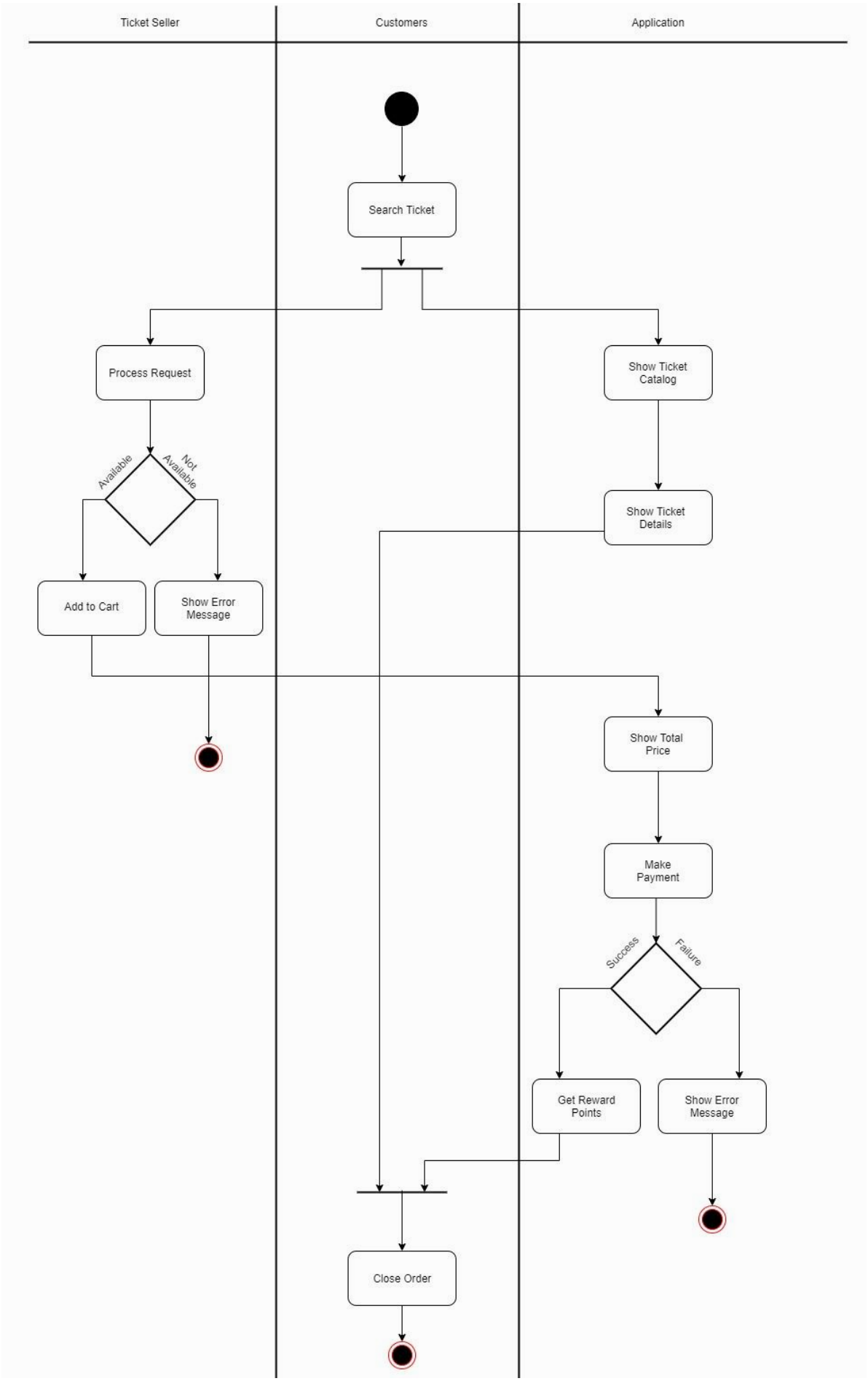
2. Login->Two factor authentication

Exceptions: 1. Display current location->Upload current location

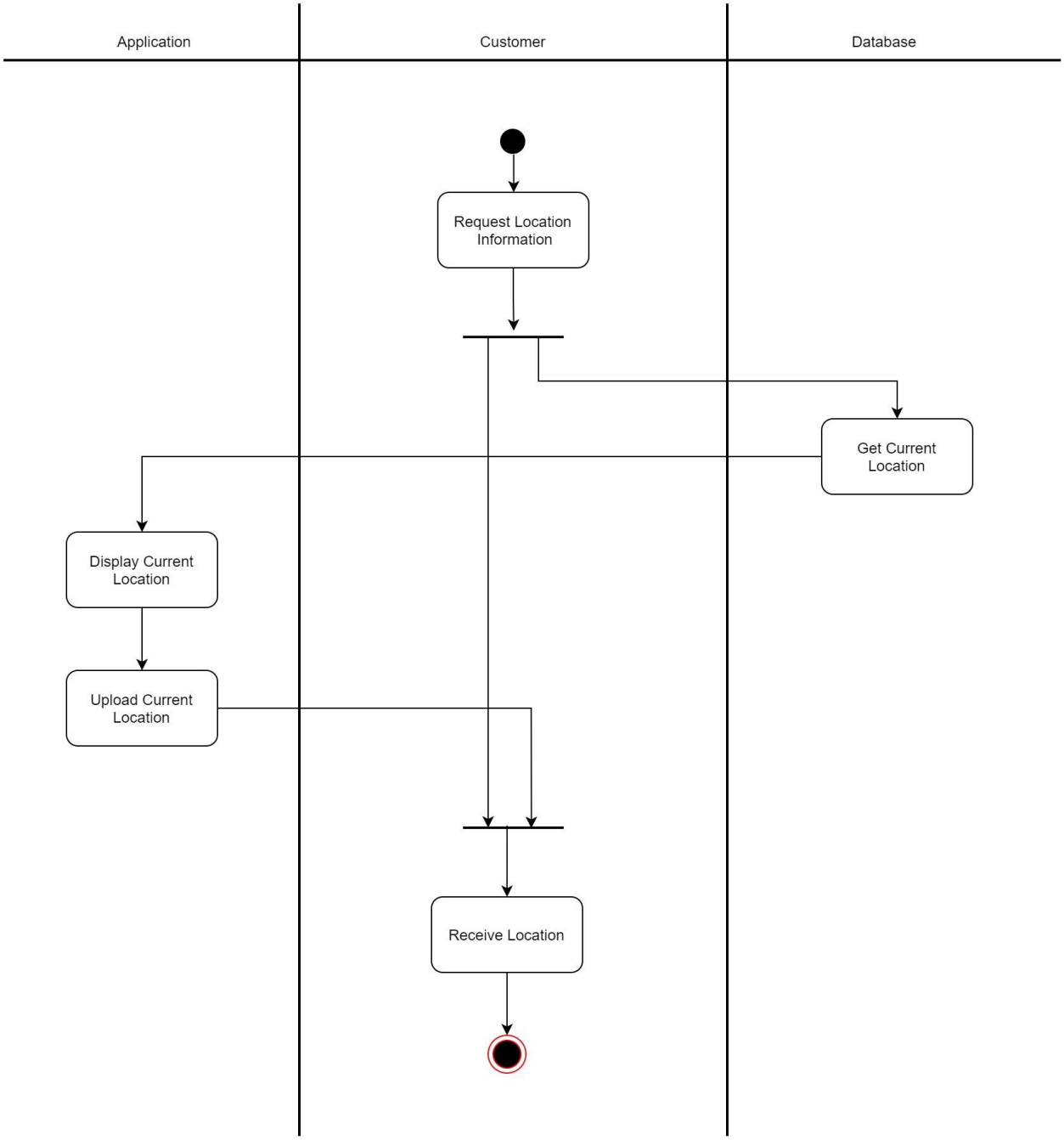
2. Purchase history

Activity Diagram(Booking)

Assignment for CSE471



Activity Diagram(Tracking)

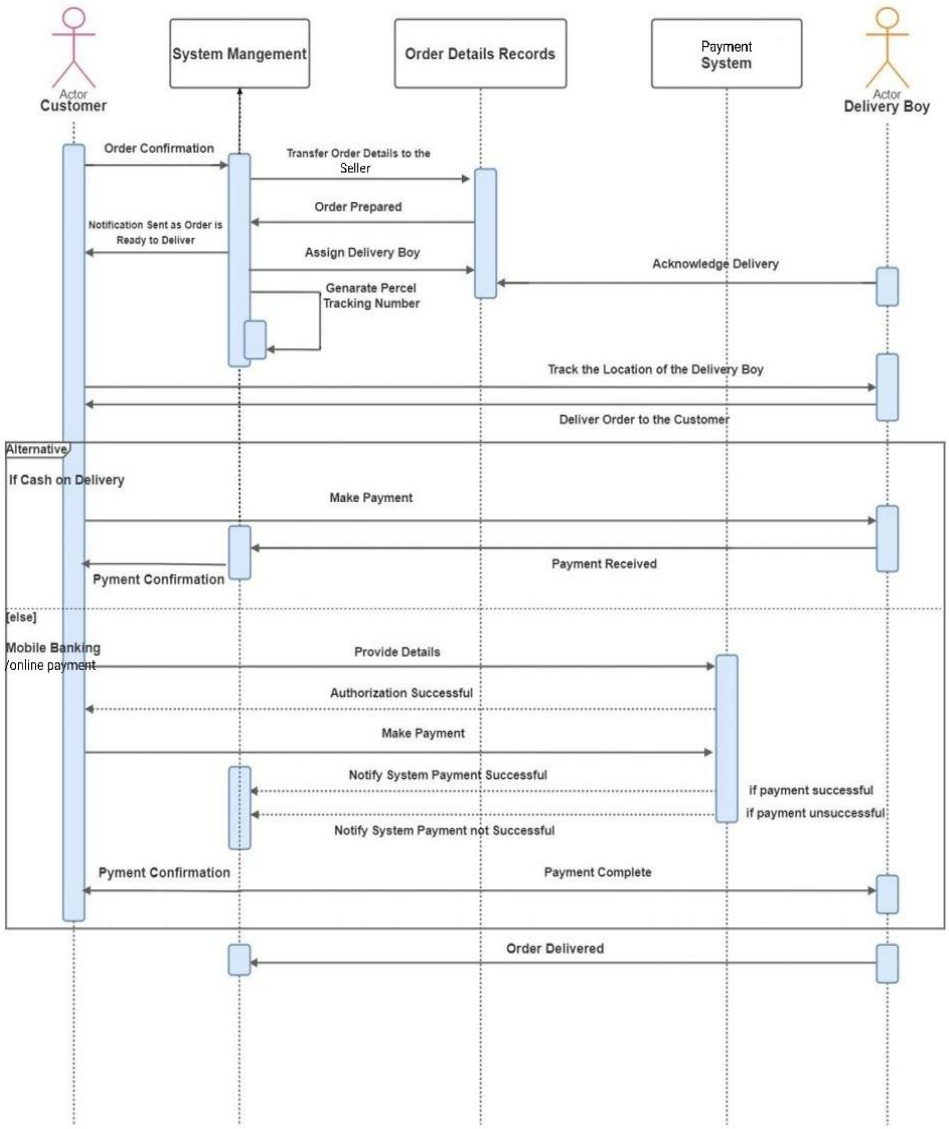


Activity Description :

In the first diagram mentioned above, activities are going on for both railway ticket booking and train location tracking. First of all, the customer/user logs into the system to search for the desired ticket. The ticket seller conducts the ticket processing necessities. If any suitable ticket is available, the user will be able to add the ticket to his/her cart. If it's not available, an error message will pop out. Lastly, after confirming the ticket, the application will calculate the total price and ask the customer for payment and the customer will be able to choose any viable payment option and receive the ticket which will then close the order.

In the second diagram, the user will request the system for some information regarding the train's location. The current whereabouts of the train will be accessed from the database and displayed on the application, which will then upload it for the user to notice.

Sequence Diagram



Sequence Description :

In the sequence diagram,

1. After getting the order confirmation message from the customer, the order details will be transferred to the order details record.

2. When the order will be ready, the system will be notified.

3. After notifying the order records the system will send a message to the customer that their order is ready to deliver.

4, Then the system assigned a delivery boy to deliver the order.

5. When the delivery boy gets the message then he will send an acknowledgement to the system.

6. System generates a tracking number so that the customer can track their parcel.

7. When the delivery boy delivers the parcel to the customer, the customer will have two options for payment -
   a. Cash
   b. Online/ Mobile banking payment.

8. If the customer pays by cash then the delivery boy will notify the system that he received the payment and the system will send a payment confirmation message to the customer.

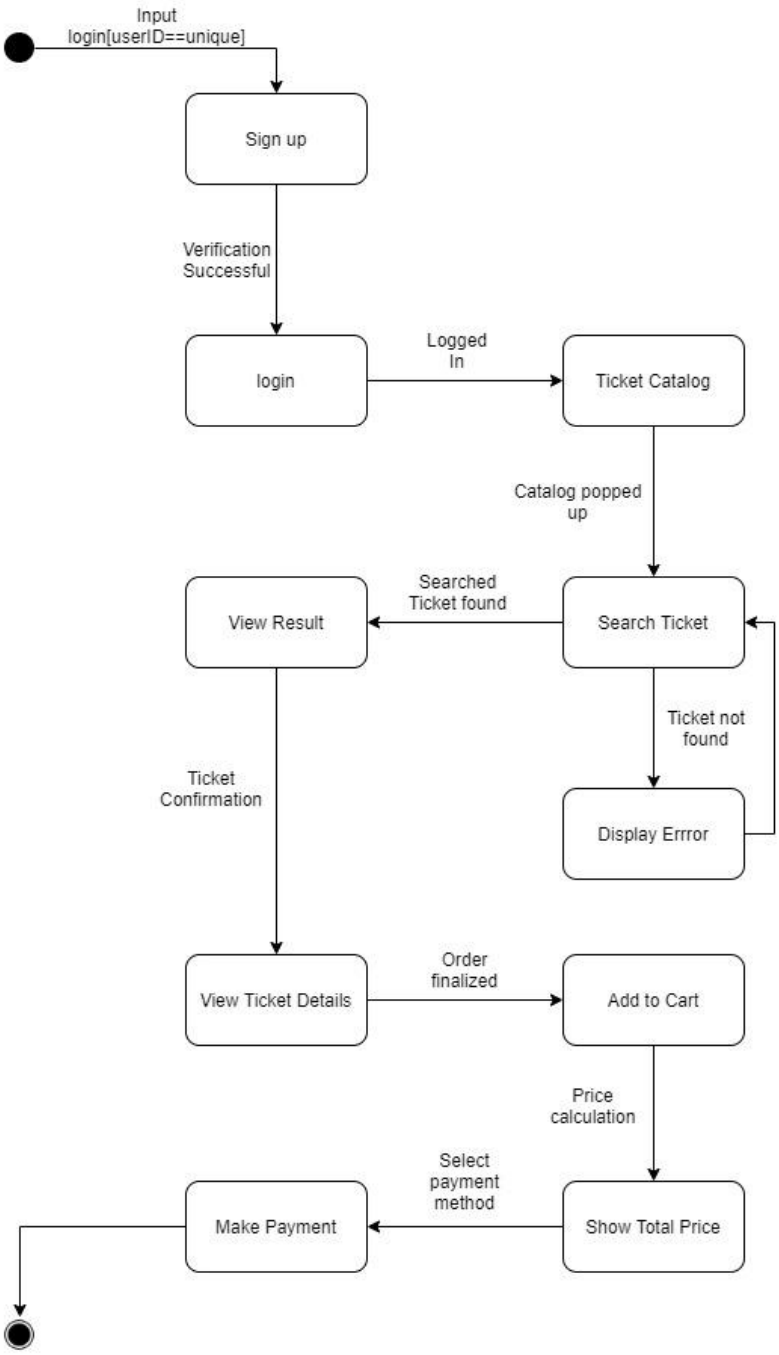
9. If a customer selects the online payment option, he will need to log into the system by giving his info in order to finish his payment .

10. Online gateway will confirm the system about whether the payment is successful or not.

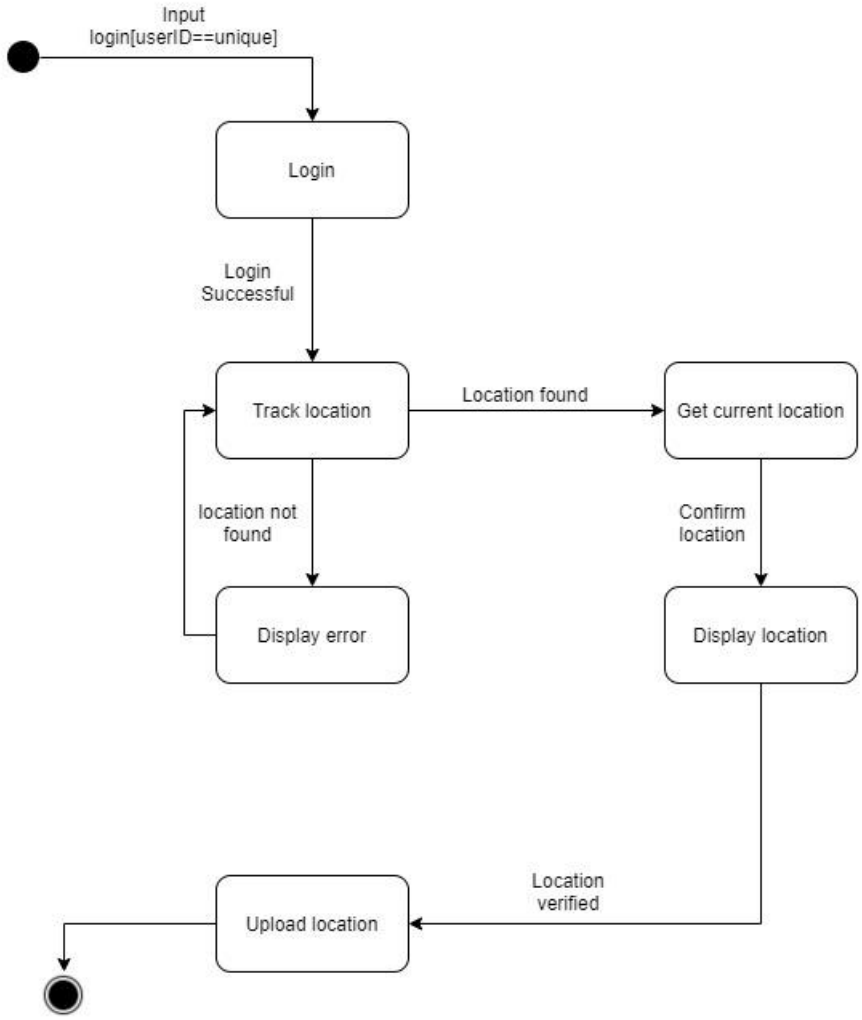
11. Then the customer and the delivery boy will get notified from the system.

12. If payment is successful, the delivery boy updates the status as "Delivered".

State Machine Diagram(Booking)



State Machine Diagram(Tracking)



State Machine Description :

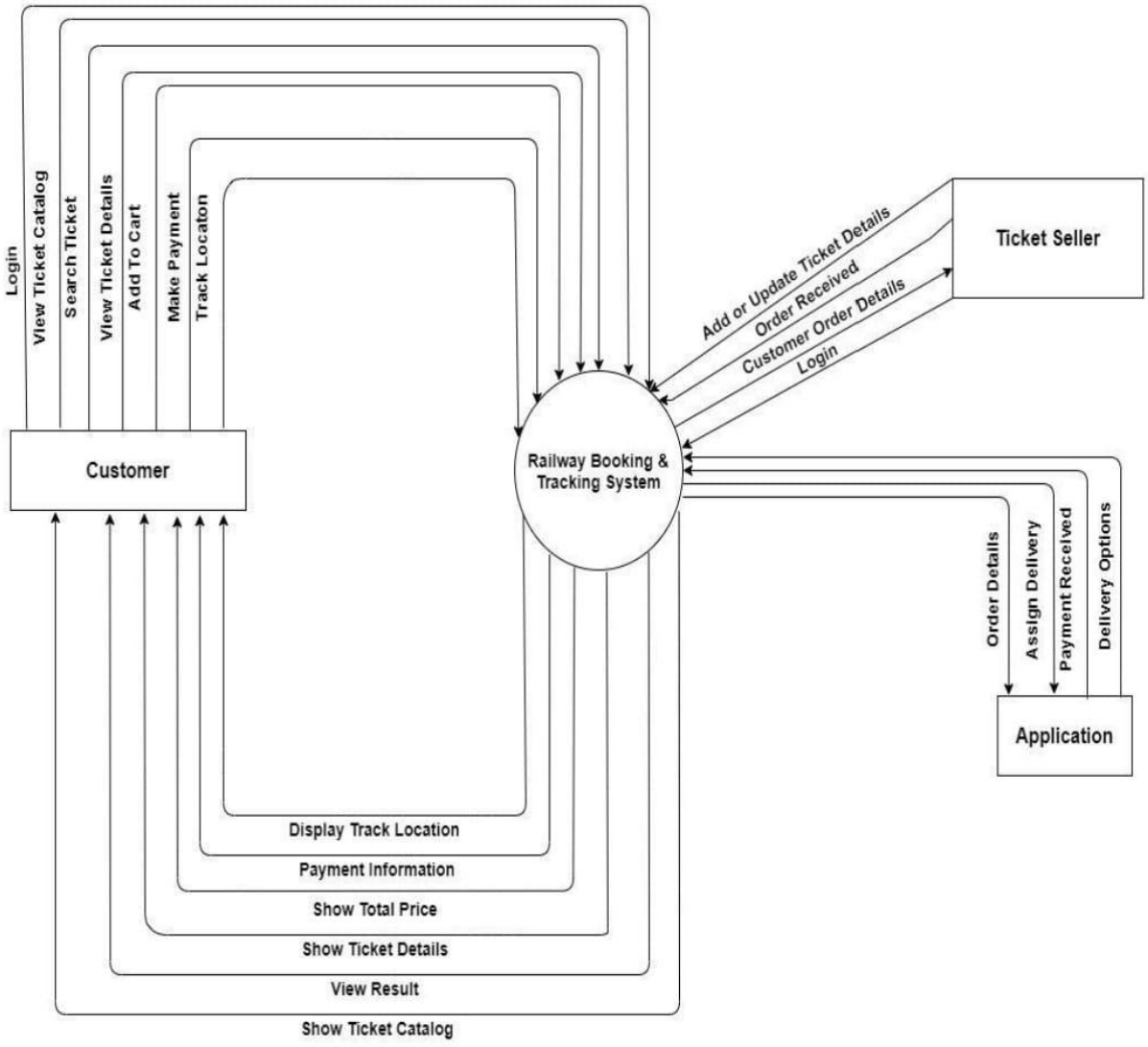
In the first state machine diagram,

1. The user will sign-up with his credentials.
2. If verified, the user will login to the system.
3. After logging in, a catalog will pop-out.
4. The user will search for a ticket using the catalog.
5. If the desired ticket is found, the user will see the result.
6. Then, if the user confirms the ticket, ticket details will be shown.
7. After the order has been finalized, the ticket will be added to the user's cart.
8. Total price will be shown after adding to the cart.
9. Lastly, the user will select a payment method and make the required payment.

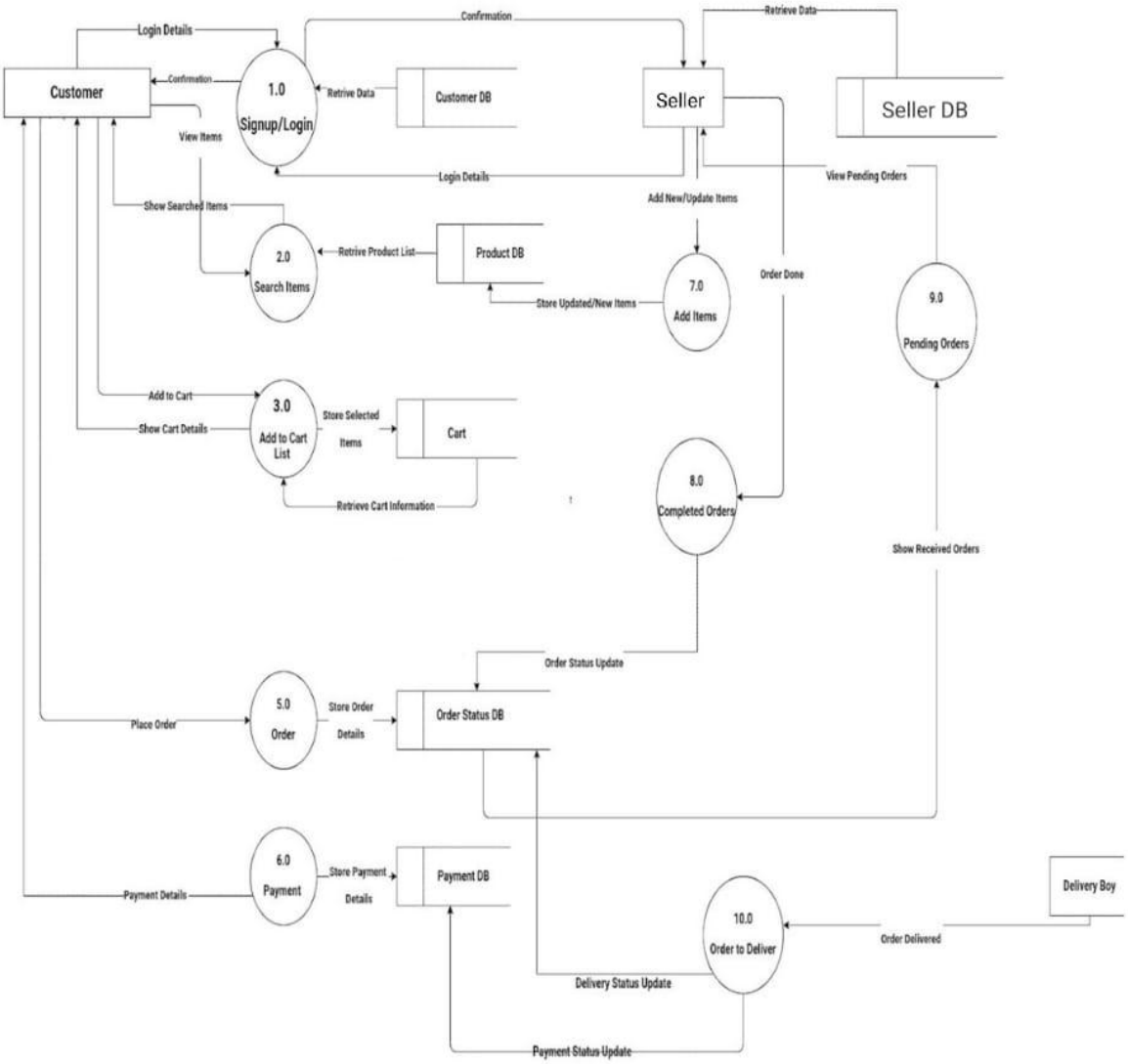
In the second state machine diagram,

1. The user will login with his credentials.
2. If successful, the user will ask the system to track location.
3. If the location is found, the current location will be initialized.
4. If the location matches with the user's location, the location will be displayed.
5. If it does not match, an error message will be displayed.
6. Lastly, if the location is verified, the system will upload the location.

Data Flow Diagram
Level 0



Data Flow Diagram
Level 1

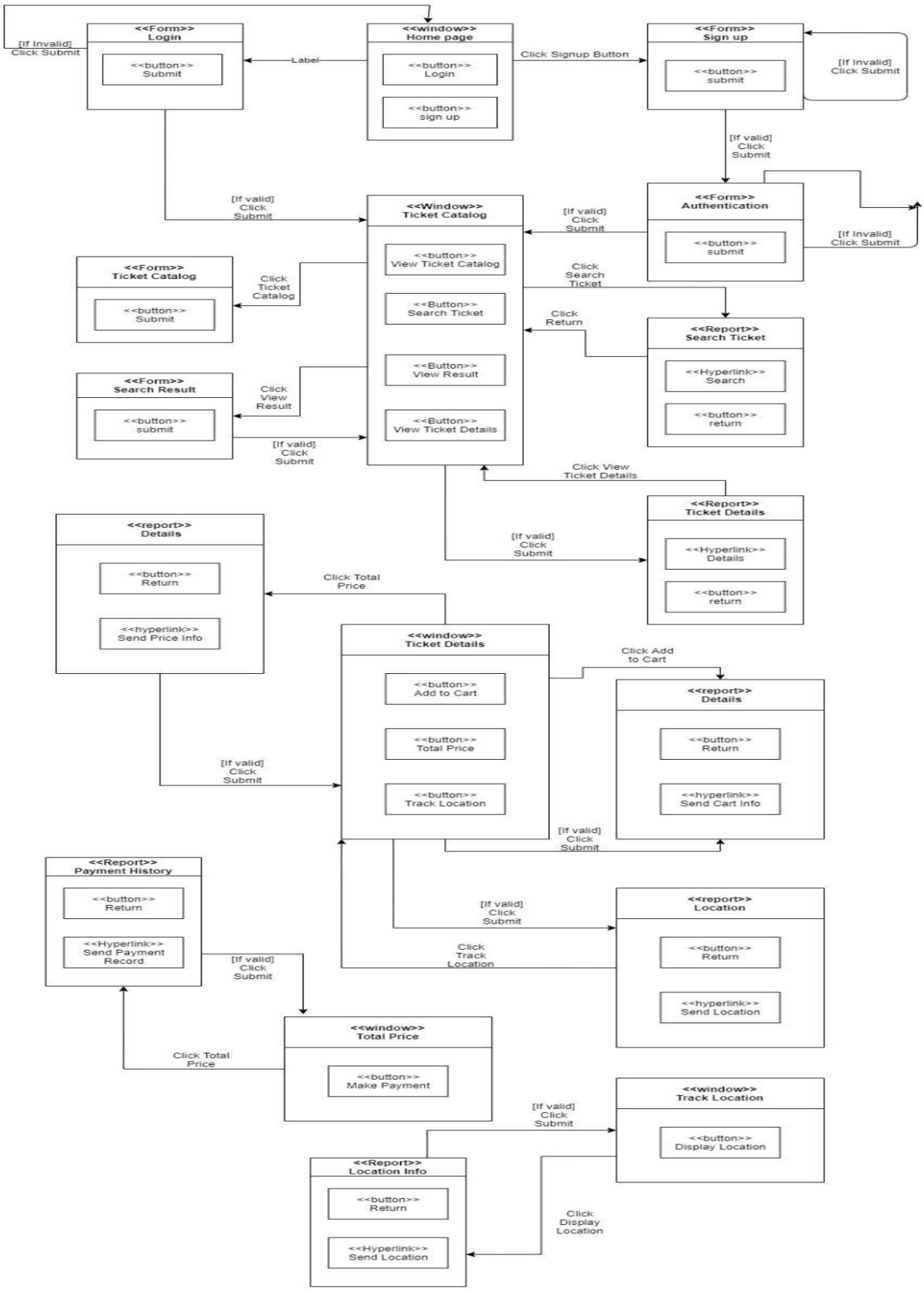


Data Flow Description:

In the above mentioned level 0 diagram, we can observe all the processes present in the system have been combined into a single process. Some external agents like customer, ticket-seller and application are inter-connected to the system. Processes like login,signup,viewing ticket details, adding ticket to cart and payment along with payment method selection are done by the customer, who happens to be the one to trigger the system, and the system responds to these accordingly. Whereas, the other agents just act according to the customer's needs.

Then, in the level 1 diagram, processes of level 0 are split into multiple streams of processes. The earlier ones get divided into sections of processes although the elements remain the same. Datastores are visible in this level where the essential datas like the user's info, location info, ticket info, seller info and application info are stored. The system retrieves the required info from the datastore and presents it to the customer. In this case, seller DB will be accessed to know details regarding the seller.

Window Navigation Diagram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Window Navigation Description:

In the above mentioned diagram, we can spectate how a user will proceed through the entirety of the system. Firstly, a user will have access to the Login/Signup window to connect to the system. After he/she enters the requisite information, an authorization window will appear if it's a new user. Whereas, two windows named Ticket Catalog and Search Ticket will pop out if the user is a former. Then, if the user decides to search for a ticket, there will be multiple results relating to the search window. A report named View Ticket Details will show up from where the user can go to the Add to Cart form. Add to Cart form will be accompanied by a Total Price report and a window named Track Location. Total price report window will take the user to the transaction window where the user can make his payment if the ticket is confirmed. Lastly, the Track Location window will trigger the Display Location report to be displayed to the customer.

Conclusion:

To summarize, our system can be really useful in this modern time since people prefer comfort with security over hassle. Our system will provide both of these features along with a time saving technology. Also, the seller will be able to get their fair share of profit and reliability from this online business prospect.