



LEGEND OF RENTAL



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Problem Statement

Problem

This application provides a service that users are able to lend their personal belongings to another user with low cost, and they can borrow required items from the other people as well.

Need

The information system (application) to collect and track information about users while they lend or borrow items.

Subsystems

Client Registration Subsystem
Posting Subsystem
Rental Procedure Subsystem
Payment Subsystem
Searching Subsystem
Reporting/Fraud Subsystem

Stakeholder Interview Questions

ANALYST INTERVIEW QUESTIONS		
QUESTIONS	STAKEHOLDER	ANSWER
What steps do you follow to rent items?	Client [Borrower]	<ol style="list-style-type: none">1. Search items based on the category, price, and location.2. Compare items3. Select one item and request to reserve the item4. Pay deposit5. Make an appointment to pick up the item6. Meet the lender at the planned place
What information do you use to	Client [Borrower]	<ul style="list-style-type: none">-My Address-Client ID-Password

perform those operations?		-Phone number -Credit card number
What is the biggest challenge in your role?	Client [Borrower]	Comparing searched items Fraud
What is the biggest challenge in your role?	Client [Lender]	Some people do not show up and ruin the borrowed items
How did you become interested in our organization?	Investor	It is much cheaper to borrow items that is needed only once and expensive, and it is a brilliant idea to develop rental system website. For this reason, I think Legend of Rental is exactly what people want and worth investing.
Do you have any advice for improving our application?	Client, Investor, Administrator	It would be better to have a comparing function when client searches items, and calculate the time and provide the way to pick up items.
Do we offer many items that you would like to borrow?	Client [Borrower]	Yes, pretty much. If I cannot find what I want, I can write 'wanted' post to borrow it.
What did you expect while using the application?	Client [Lender]	I expected to rent my items that I do not need now and earn some money from them.
What did you expect while using the application?	Client [Borrower]	I expected to borrow items with lowest price
Will you use the application again?	Client	Of course, I will!

System Vision Document

Problem Description

In the rental marketplace, the ratio between supply and demand is one-to-many because renting is much cheaper than buying. However, personal suppliers in a rental marketplace need to work more than retailers in that suppliers need to manage delivery and pick-up his belongings by himself. In addition, the problem of rental marketplace is that demanders usually do not reuse the same item, but rent it only once. If an item has low average profits, it is inefficient for suppliers to rent the item frequently to another person.

To solve this problem, it is recommended that a new system be developed and deployed so personal rental suppliers can effectively communicate with demanders and more easily rent his belongings with the home office or by smart phones.

System Capabilities

The new system should be capable of

- Collecting and Storing information about users
- Collecting and Storing (create, update, delete) information about items
- Sorting items by category, price, user location, and user reputation
- Bargaining price / Suggesting today's deal based on a user's preference or what user's searched
- Writing reviews or feedback to lender/borrower
- Evaluating user reputation
- Reporting a user who goes against the application policies
- Calculating statistics about items, interactions between users and their reputations
- Connecting via Wi-Fi (Internet) and transmitting data
- Online payment security

Business Benefits

It is anticipated that the deployment of this new system will provide the following business benefits to Rental Everything:

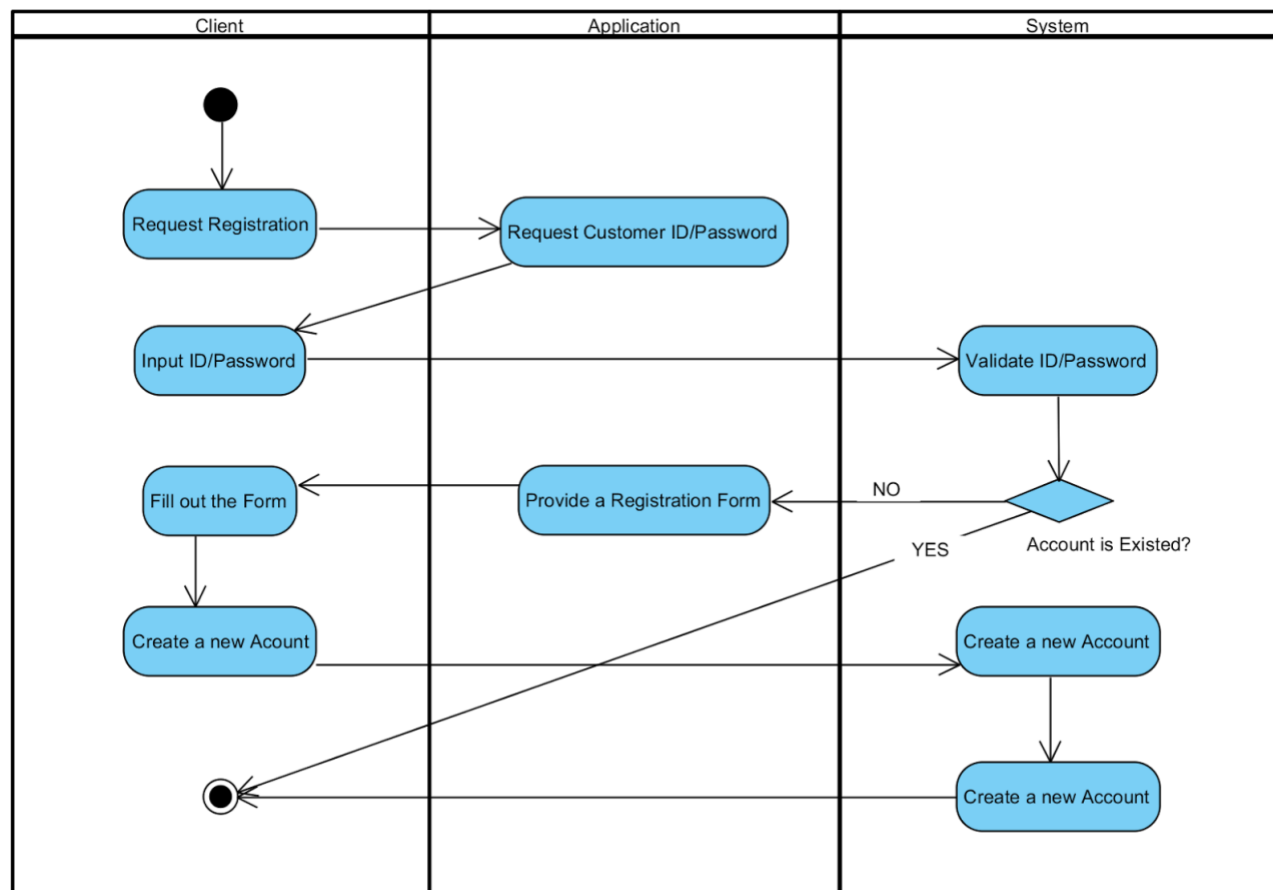
- Maintain correct and current information about users, thereby facilitating rapid communication with users and the enterprise.
- Maintain correct and rapid information and images about items to rent, thereby facilitating the development of Web pages
- Expedite the requesting an order for items users demand, thereby catching the trends more rapidly and speeding up item availability
- Increase timely communication between a supplier and a demander, thereby improving the quality and speed of transaction decisions

Workflows

1.0 Client Registration Subsystem

The Client Registration Subsystem is used for registering a new client. The application gathers Client's information and validates it to determine if the client is new or not.

- 1.1 Client requests registration
- 1.2 Legend of Rental requests client information (ID / Password)
- 1.3 Client inputs ID and Password
- 1.4 System verifies the information
- 1.5 If the ID and Password that client input are existed, no registration is needed.
 - 1.5.1 If the client is existed, no registration is needed. END
 - 1.5.2 If the client is not existed, the application provides a registration form.
- 1.6 Client fills the registration form
- 1.7 Client submits the Form
- 1.8 System validates the information
- 1.9 System creates a new client account



2.0 Posting Subsystem

Posting system is that user can upload user's post to League of Rental server. User who has a validate session requests posting, League of Rental provides posting form to user. After user fill the posting form and send request to League of Rental, League of Rental shows up indicator that can be prevent accepting other event. Also, system suspend user's posting to block double posting. System uploads user's posting.

2.1 User requests posting

2.2 System check user's session

2.2.1. If session exist, League of Rental provides posting form to user

2.2.2. If session is deleted, bring up login/register page

2.3. User fills the posting form

2.4. User requests upload posting

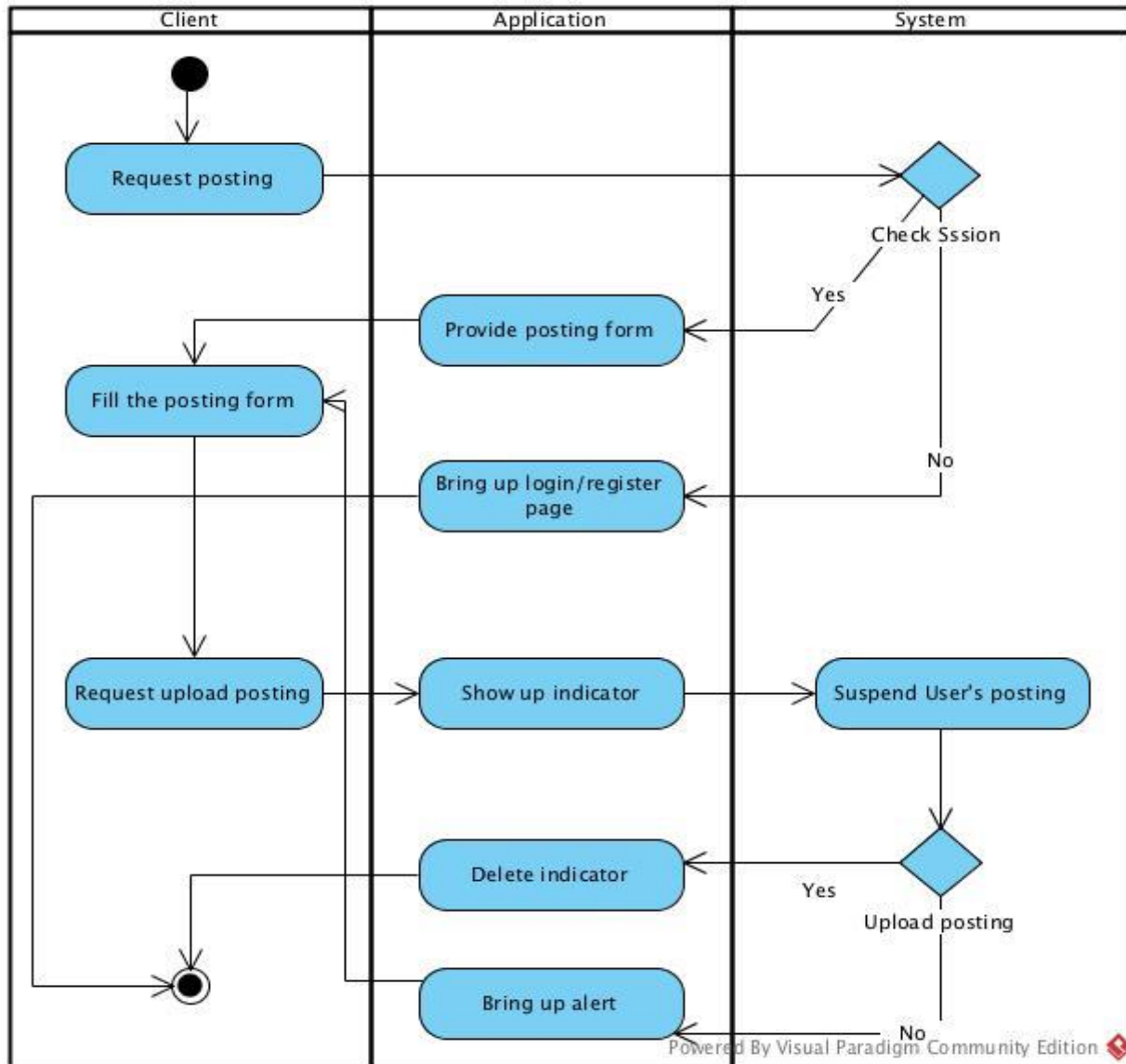
2.5. League of Rental show indicator up and send request to post to system

2.6. System suspend the user's posting until finish uploading to prevent double uploading

2.7. System upload user's posting to server

2.7.1. If uploading is success, League of Rental delete indicator

2.7.2. If uploading is failed, League of Rental delete indicator and bring up alert message and go back to fill the posting form

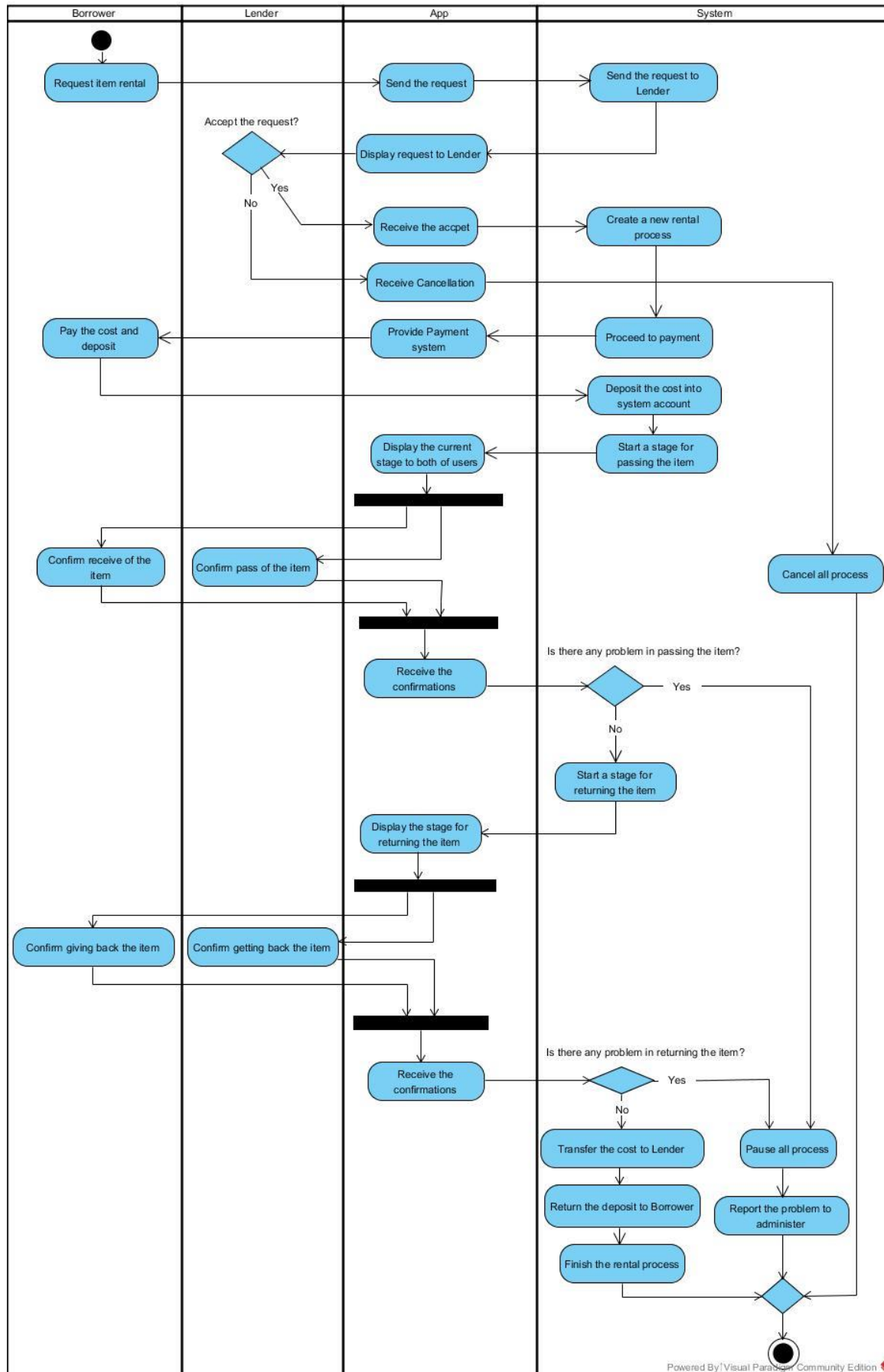


3.0 Rental Procedure Subsystem

The rental subsystem is to intermediate between two client (one is lender, the other one is borrower). When a client tries to request an item, this subsystem connect

the person to the owner of the item. Then if the lender accepts the request, the rental procedure starts, and the borrower pays the cost and the deposit to the system for borrowing item until the procedure is complete. The clients lend/borrow the item and return it, they need to confirm that the procedure is safely done. After then the system returns the deposit to the borrower, and transfers the cost to the lender except a commission. And finally, the subsystem is finished.

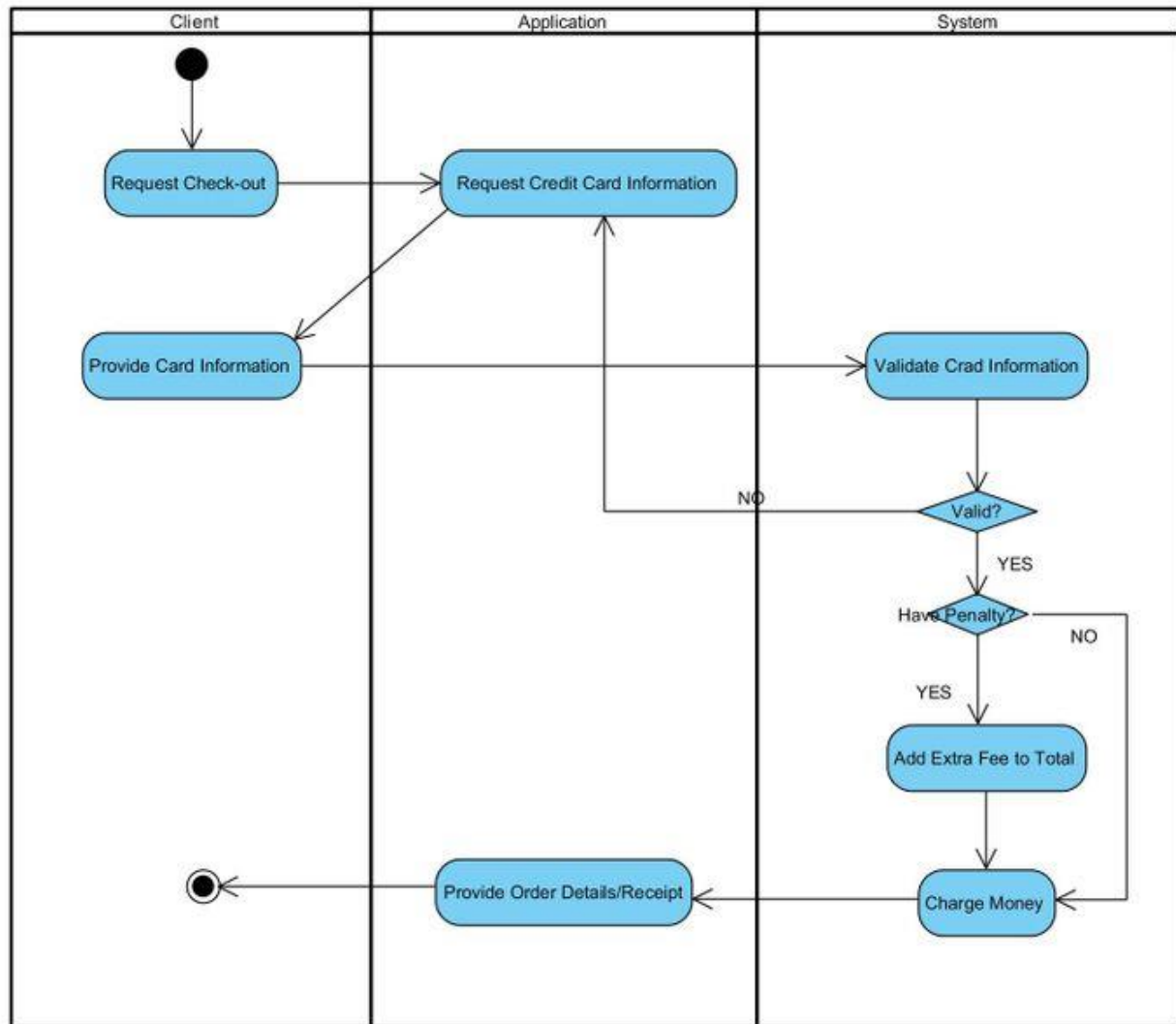
- 3.1 Borrower requests rental an item
- 3.2 Application sends the request to System
- 3.3 System sends the request to Lender
- 3.4 Application displays the request to Lender
- 3.5 Lender decides about accepting the request
 - 3.5.A If Lender accepts the request, go to 3.7
 - 3.5.B If Lender does not accept the request, go to 3.23
- 3.7 Application receives the accept
- 3.8 System creates a new rental process
- 3.9 System proceeds to payment
- 3.10 Application provides payment system to Borrower
- 3.11 Borrower pays the cost and the deposit
- 3.12 System deposits the cost and the deposit into system account
- 3.13 System proceeds to pass the item
- 3.14 Application displays the current stage to Lender and Borrower
 - 3.14.A Lender confirms pass of the item
 - 3.14.B Borrower confirms pass of the item
- 3.15 Application receives the confirmations
- 3.16 System checks if any problem is in the process of passing the item
 - 3.16.A If there is any problem, go to 3.24
 - 3.16.B If there is no problem, go to 3.17
- 3.17 System proceeds to return the item
- 3.18 Application displays the stage for returning the item
 - 3.18.A Borrower confirms giving back the item
 - 3.18.B Lender confirms getting back the item
- 3.19 Application receives the confirmations
- 3.20 System checks if any problem is in the process of returning the item
 - 3.20.A If there is any problem, go to 3.21
 - 3.20.B If there is no problem, go to 3.18
- 3.21 System transfers cost to Lender's account from system account
- 3.22 Finish the rental process; End
- 3.23 System cancels rental process; End
- 3.24 System pauses rental process
- 3.25 System reports the problem to administer; End



4.0 Payment Subsystem

Client needs to pay the total price when they reserve a product to borrow, or pay for penalty when they return borrowed product later than expected date. System validates client's credit card information and then process the payment. Once the payment is finished, System sends order details to clients. Therefore, clients can review their order information and order history.

- 4.1 Client requests check-out
- 4.2 Application requests credit card information
- 4.3 Client provides credit card information
- 4.4 System validates the card information
- 4.5 If the card is valid, go to 4.7
- 4.6 If the card is not valid, go back to 4.2 and requests the valid credit card information
- 4.7 System checks if the client has any penalties
- 4.8 If the client has any penalties, add extra pay and go to 4.10
- 4.9 If the client has no penalty, then go to 4.10
- 4.10 System charges money from the valid credit card
- 4.11 Application provides order details and receipt to the client



5.0 Searching Subsystem

In Searching subsystem, user could apply details to find their ideal item in Legend of Rental.

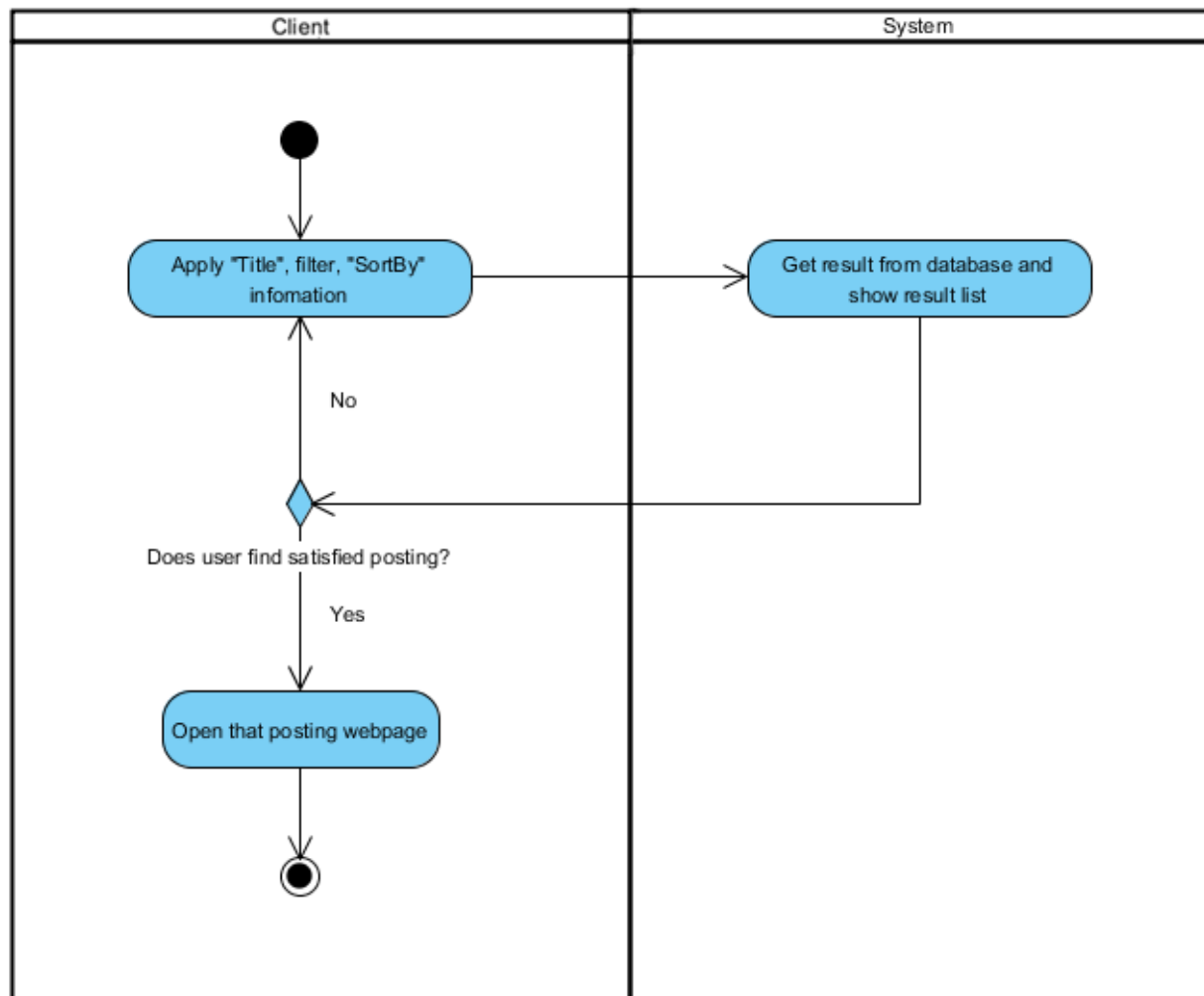
5.1 Client apply item "title", filter, and "SortBy" information

5.2 System get result from database and show result list

5.3 Client check if satisfied with the result

5.3.1 if no, then apply a new search

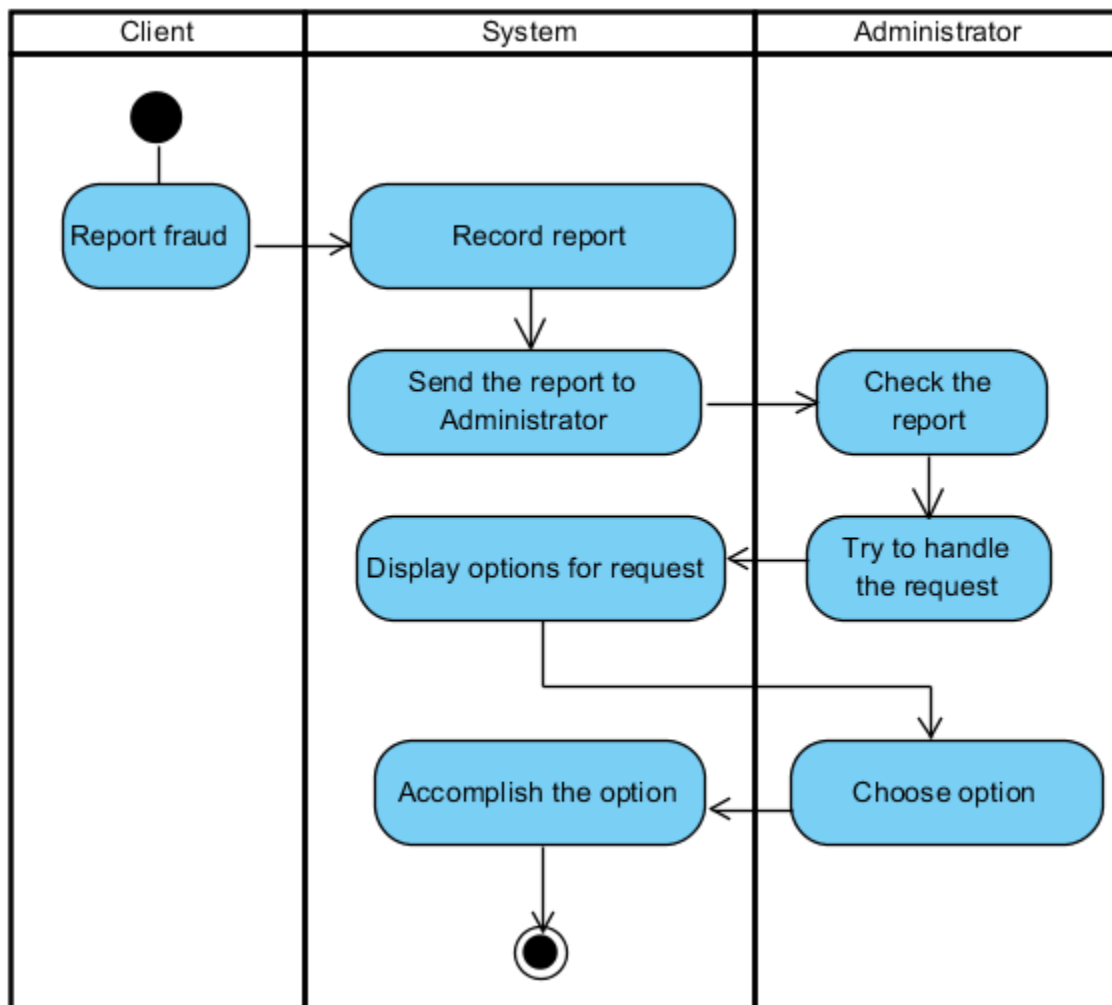
5.3.2 if yes, open the satisfied item page



6.0 Reporting/Fraud Subsystem

Allows the client to report a fraud to protect assets from a swindle under the administrator's control.

- 6.1 Client reports a fraud through the system
- 6.2 System records report
- 6.3 System sends the report to administrator
- 6.4 Administrator checks the report
- 6.5 Administrator tries to handle the request
- 6.6 System displays options for request
- 6.7 Administrator chooses the proper option
- 6.8 System accomplishes the option; End



Use Cases

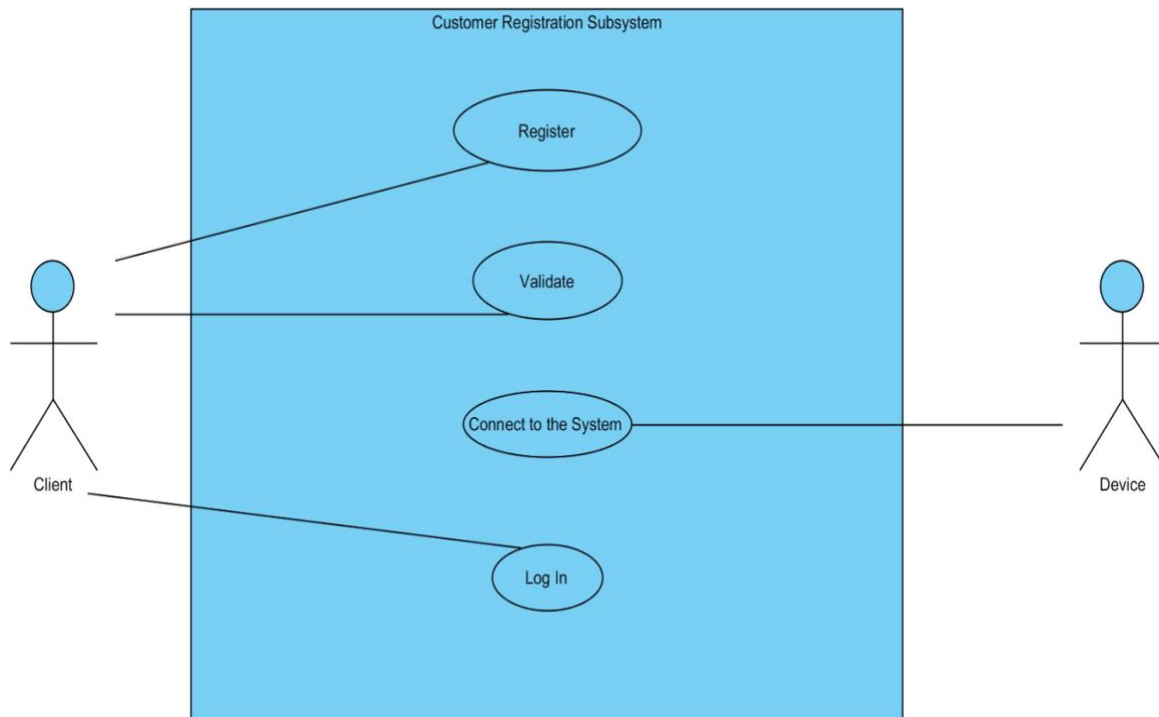
1.0 Client Registration Subsystem

User	User Goal and Resulting Use Case
Client	Create a new Account Log-in
Device	Connect to the Legend of Rental system after an user logs in via Wi-Fi or data connection

Use Case	Brief Use Case Description
Create a new Account	Client requests to create a new account, and the system creates a new account
Validate Card Information	Client inputs his/her ID and password, and the system validates the information. If the information is valid, the system is going to connect the device. But if it is not, the system is going to display an alert message that input information is not valid and prompts users to re-input their information
Connect to the system	Device requests to be connected to the Legend of Rental, and the System validates the device user
Log In	Client requests to be logged in the system, and the system makes the user logged in

Client Registration Subsystem	
Use cases	Users/Actor
Create a new Account	Client
Validate Card Information	Client
Connect to the system	Device

Log In	Client
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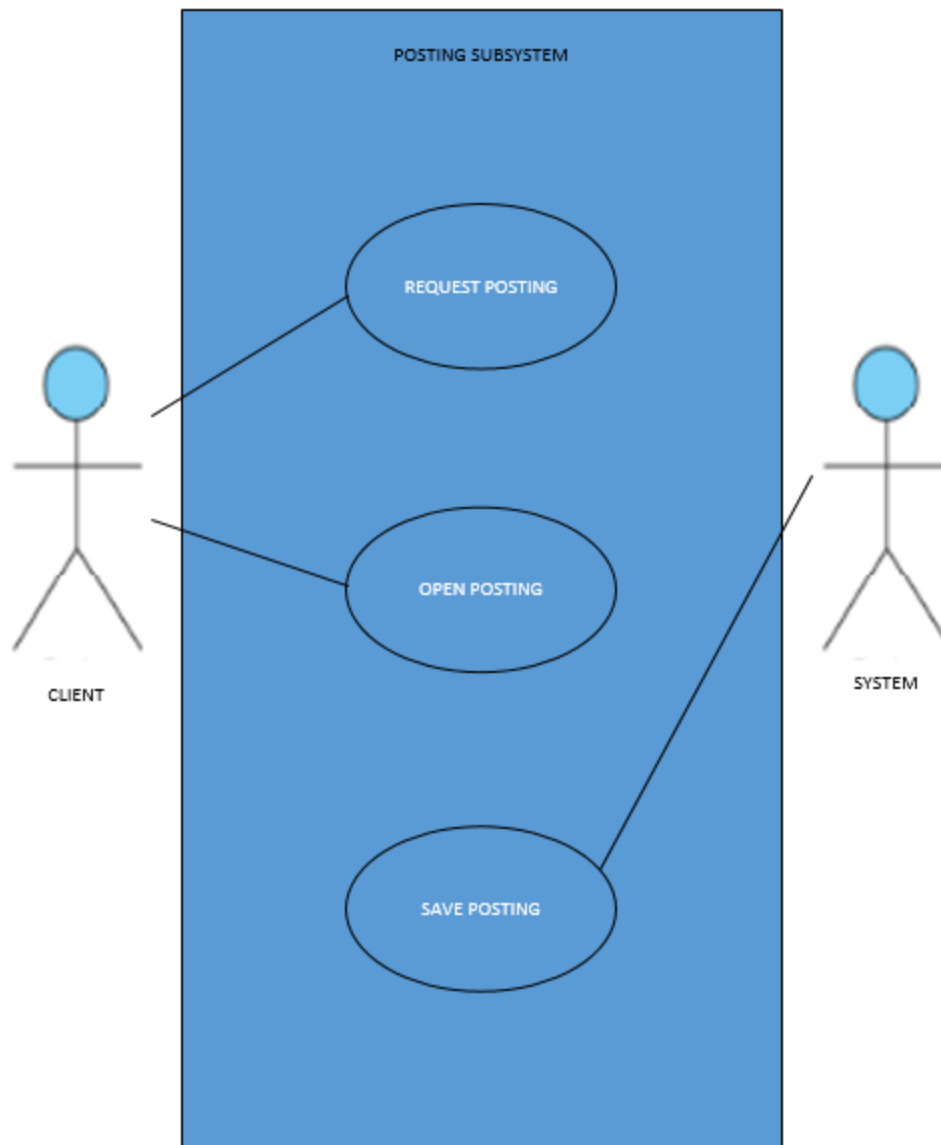


2.0 Posting Subsystem

User	User Goal and Resulting Use Case
Client	Request posting form Request uploading to post
System	Upload posting

Use Case	Brief Use Case Description
Request uploading	After fill the form, user request uploading.
Request posting form	Client request posting form, and the system checks user's session. If user's state is logon, system provides validate form to user.
Request uploading	After fill the form, user request uploading.
Request modifying	After upload user's posting, user can change the contents of posting

Posting Subsystem	
Use cases	Users/Actor
Request posting form	Client
Request uploading	Client
Request modifying	Client

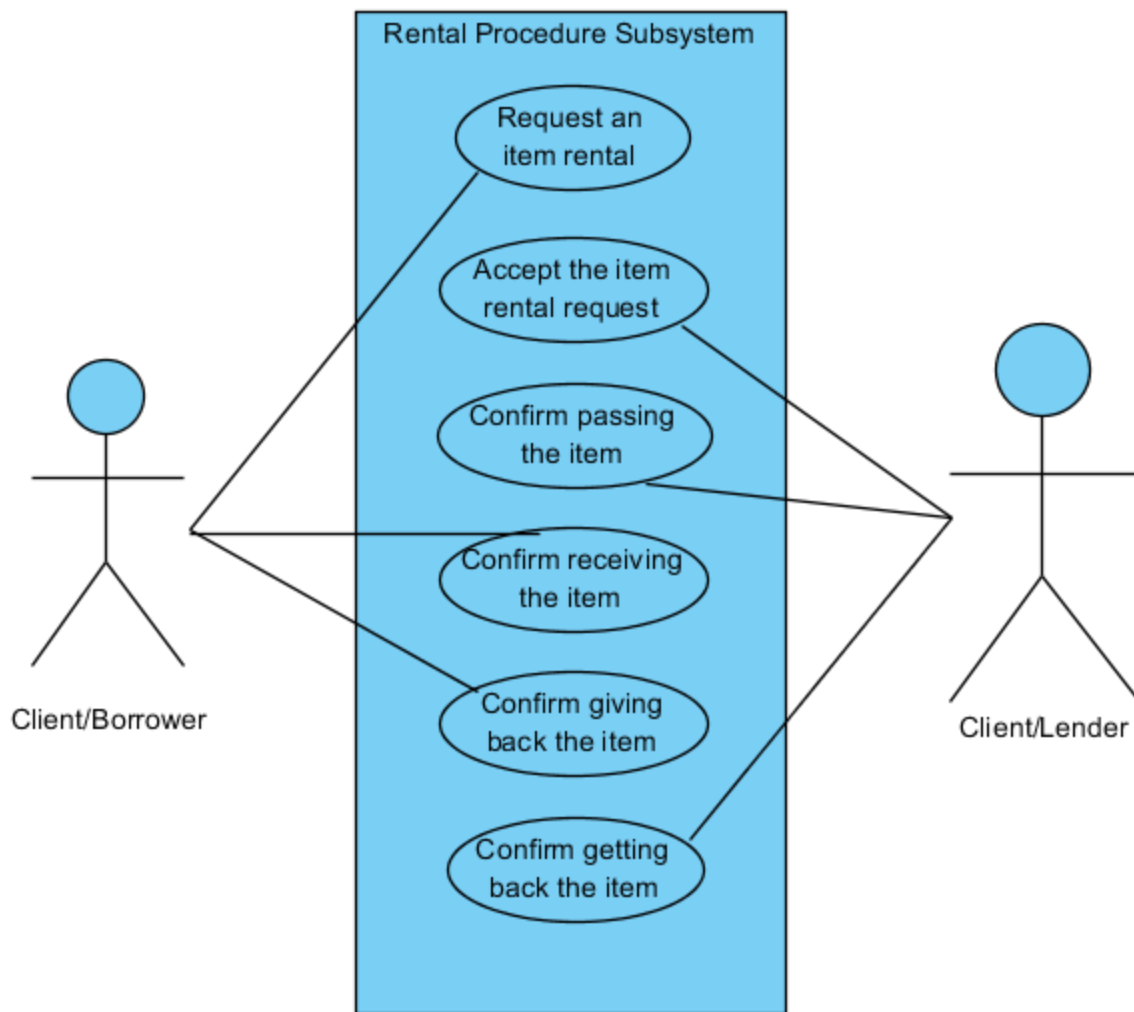


3.0 Rental Procedure Subsystem

User	User Goal and Resulting Use Case
Client/Borrower	Request an item rental Confirm receiving the item Confirm giving back the item
Client/Lender	Accept the item rental request Confirm passing the item Confirm getting back the item

Use Case	Brief Use Case Description
Request an item rental	Client/Borrower requests item rental with conditions, and the system checks the conditions are available, then send the request message to Client/Lender.
Accept the item rental request	Client/Lender accepts an item rental request, and the system create a new rental process.
Confirm receiving the item	Client/Borrower confirms that they received the item, and the system waits for the other confirm from Client/Lender, then proceeds to returning item.
Confirm passing the item	Client/Lender confirms that they gave the item, and the system waits for the other confirm from Client/Borrower, then proceeds to returning item.
Confirm giving back the item	Client/Borrower confirms that they gave back the item, and the system checks waits for the other confirm from Client/Lender, then proceeds to finish the rental process.
Confirm getting back the item	Client/Lender confirms that they gave back the item, and the system checks waits for the other confirm from Client/Borrower, then proceeds to finish the rental process.

Rental Procedure Reservation / Warranty Program Subsystem	
Use cases	Users/Actor
Request an item rental	Client/Borrower
Accept the item rental request	Client/Lender
Confirm receiving the item	Client/Borrower
Confirm passing the item	Client/Lender
Confirm giving back the item	Client/Borrower
Confirm getting back the item	Client/Lender



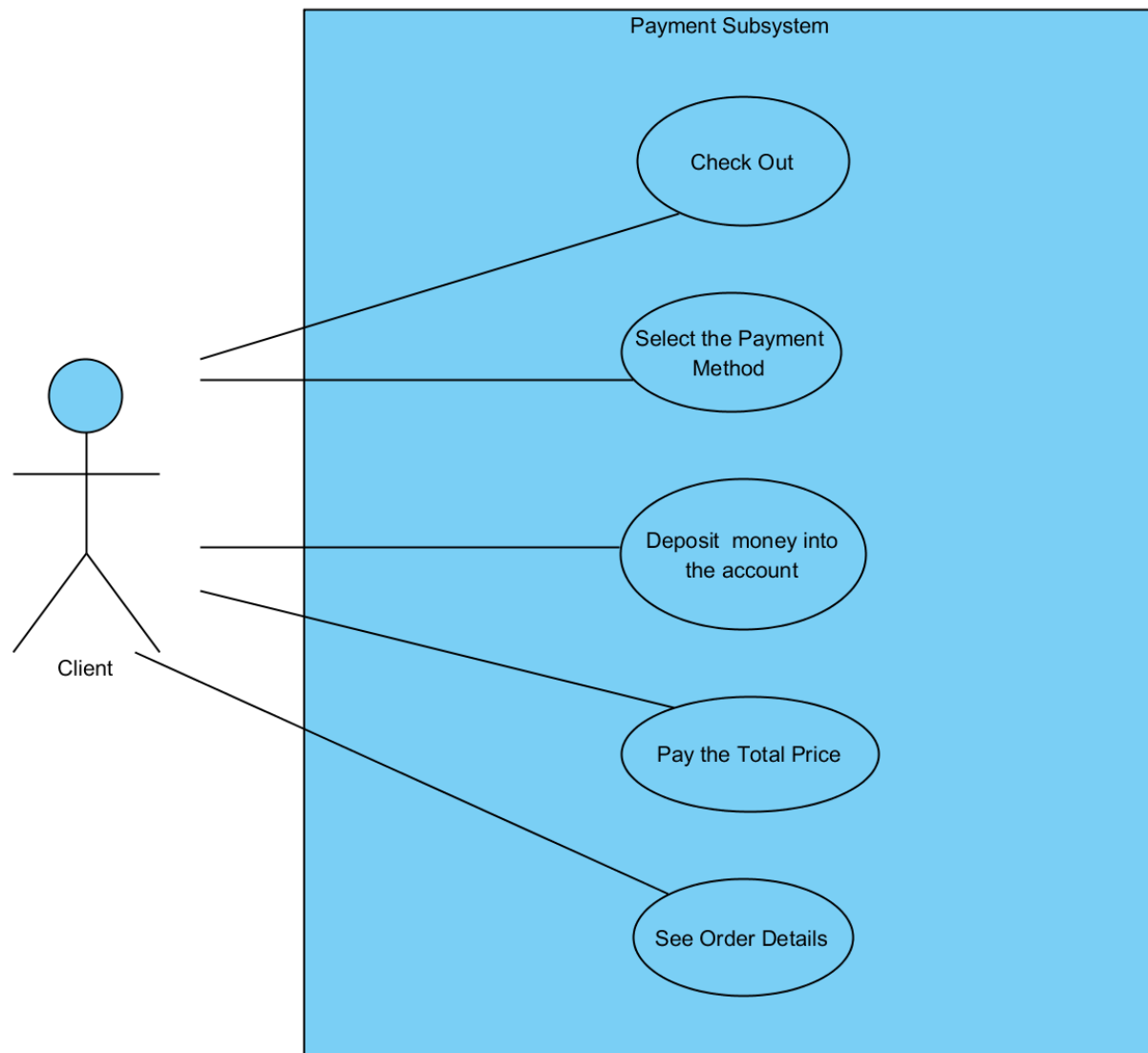
4.0 Payment Subsystem

User	User Goal and Resulting Use Case
Client	Deposit money into the user account Check out Select the payment method Pay the total price See order details

Use Case	Brief Use Case Description
Deposit money into the account	Client requests to deposit money into his/her account, and the System adds money into the account
Check out	Client requests the check-out, and the system calculates the total price and display it to Client
Select the Payment Method	System shows the way to pay, and Client selects the payment method between them.
Validate the credit/debit card	Client inputs Credit/Debit card information, and the System validates the credit/debit card information that user input. If the card is valid, the Client can pay by the card. If it is not, the system displays requests a valid information again
Pay the Total Price	Client requests to pay the total price by the card that is validated by the System, and the System charges
See Order Details	After validation and the payment, System sends order details and receipts to the Client/User

Payment Subsystem	
Use cases	Users/Actor
Deposit Money into Account	Client
Check out	Client

Select the Payment Method	Client
Pay the Total Price	Client
See Order Details	Client

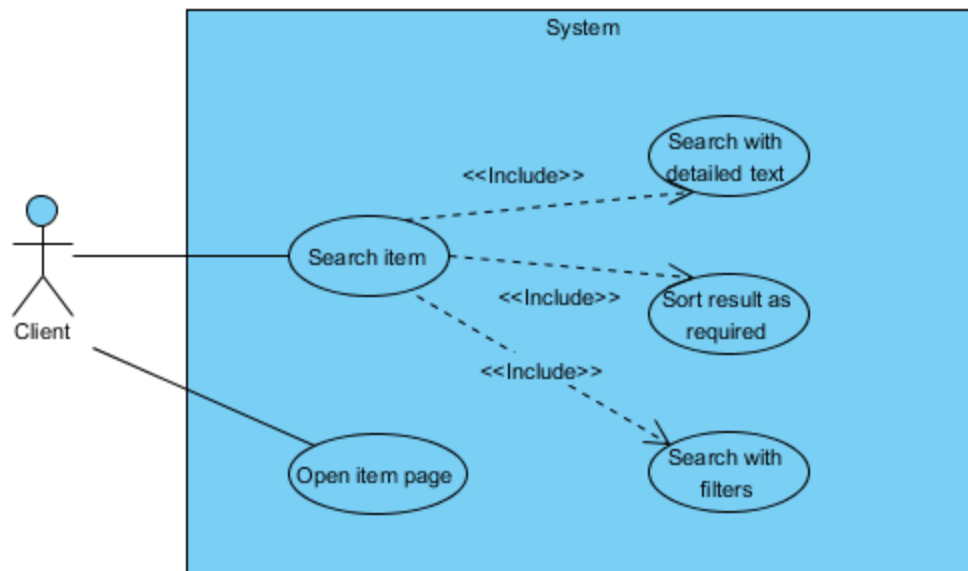


5.0 Searching Subsystem

User	User Goal and Resulting Use Case
Client	Search for items they want Search item with detailed content Search item with filters Sort item as required Open webpage of selected item

Use Case	Brief Use Case Description
Search item	Search item with title, optional filter, and sorting method
Search with content	Search item with detailed content
Search with filter	Search item with filters, such as category, location, cost range, available time
Sort result as required	Sort result items by distance, cost, item rate or lender rate
Open item page	Open the item webpage that user feel satisfied

Searching Subsystem	
Use cases	Users/Actor
Search item	Client
Search with content	Client
Search with filter	Client
Sort result as required	Client
Open item page	Client



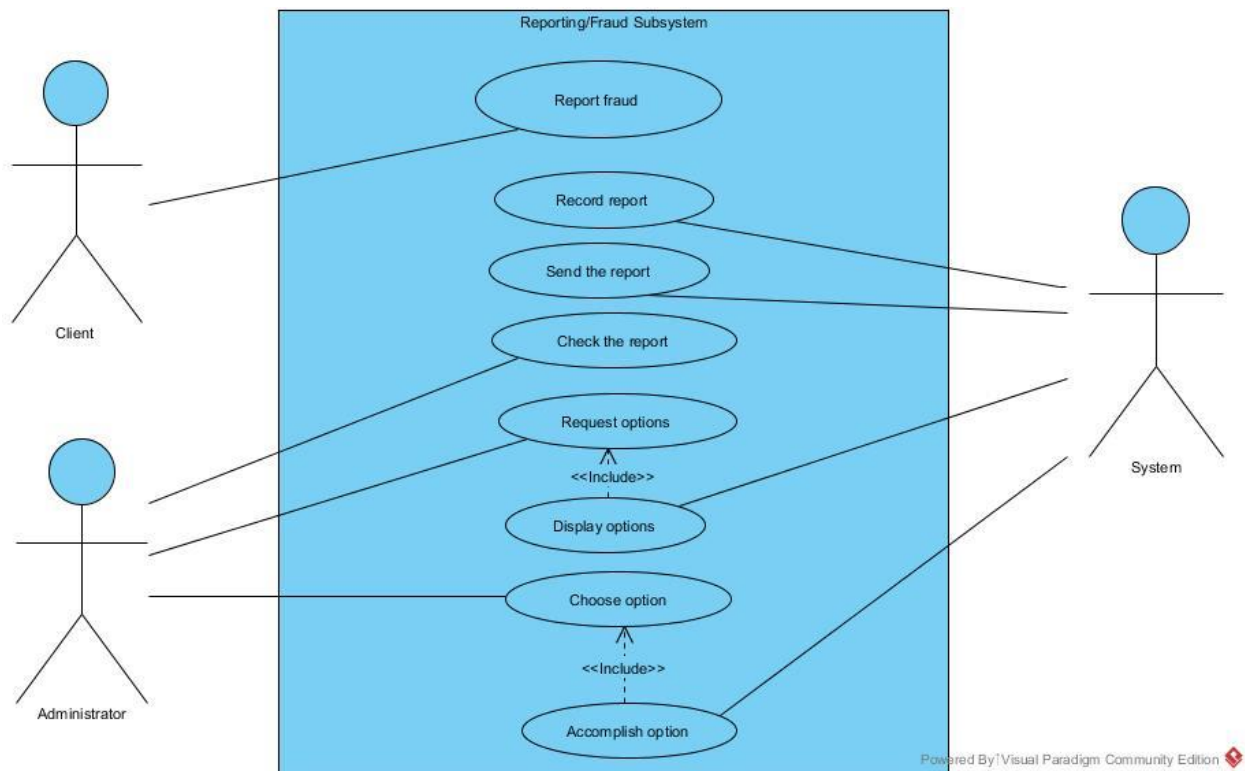
6.0 Reporting/Fraud Subsystem

User	User Goal and Resulting Use Case
Client(reporter)	Report a fraud
administrator	Check the report Request options for dealing with the report Choose option
System	Record the report Send the report Display available options Accomplish the selected option

Use Case	Brief Use Case Description
Report Fraud	Client reports fraud through Reporting/Fraud subsystem, and the system create report and assigns unique reportID
Record report	The system record the report, and administrator checks report and follow history of report up
Send the report	The system sends the report to administrator, and administrator recognize the report and check the report
Check the report	Administrator check the report, and the system wait for administrator's request
Request options	Administrator request options handling of the report, and the system lists the options
Display options	The system displays the options, and administrator checks available options
Choose option	Administrator chooses the penalty option to execute for the report, and the system prepares the proper progress
Accomplish the option	The system accomplishes the penalty option selected by administrator, administrator closes the processing of the report

Reporting/Fraud Subsystem	
Use cases	Users/Actor
Report Fraud	client
Record report	System
Send the report	System
Check the report	Administrator
Display options	System
Request options	Administrator
Choose option	Administrator

Record report	System
Send the report	System
Display options	System
Accomplish the option	System



User Stories

Client Registration

USER STORY	ACCEPTANCE CRITERIA
As a client, I want to make a new account so that I can use the rental service your application provides.	<ul style="list-style-type: none"> Validating user information must be needed Register using Facebook / Google account Logs In successfully Connect user device to the application via Wi-Fi/Data connection
As an administrator, I want to see the list of clients so that I can manage clients effectively.	<ul style="list-style-type: none"> Sort clients by name, location

Rental Procedure

USER STORY	ACCEPTANCE CRITERIA
As a borrower, I want to send a request to lender so that I can borrow an item.	<ul style="list-style-type: none"> Trigger request in a post/item page, if the item is available for rental Enter a period for an item rental Validate their credit card available
As a lender, I want to accept a request from a borrower so that I can lend an item.	<ul style="list-style-type: none"> Trigger accept in the request page, if there is a valid request from a borrower Validate their account

Reporting/Fraud

USER STORY	ACCEPTANCE CRITERIA
As a client, I want to report a fraud so that I can protect my property from fraud through the report subsystem	<ol style="list-style-type: none"> Available forms for reporting/fraud must be shown on the screen when available Put title and content for reporting a fraud Click the button to submit the report

As an administrator, I want to handle the report so that I can get back the stabilized system	<ol style="list-style-type: none"> 1. Check the unsolved report submitted by client 2. Click the request for penalty options 3. Select one of the available penalty options on the screen
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Detailed Use Case Description

1.0 Client Registration

Use Case Name:	Client Registration	
Scenario:	Client requests to create a new account	
Triggering Event:	New client wants to set up account online	
Brief Description:	Client creates a new account by entering information such as name, phone number, and then following up with a Credit card information.	
Actors:	Client	
Related Use Cases:	Might be invoked by the Rental Procedure, Post, Report use cases	
Stakeholders:	Client	
Preconditions:	Client hasn't created an account before with same ID/Password in the system.	
Postconditions:	Client must be created and saved. Credit card information must be validated. Card must be linked with client. Account must be created and saved. Account and Address must be associated with client.	
Flow of Activities:	Actor	System

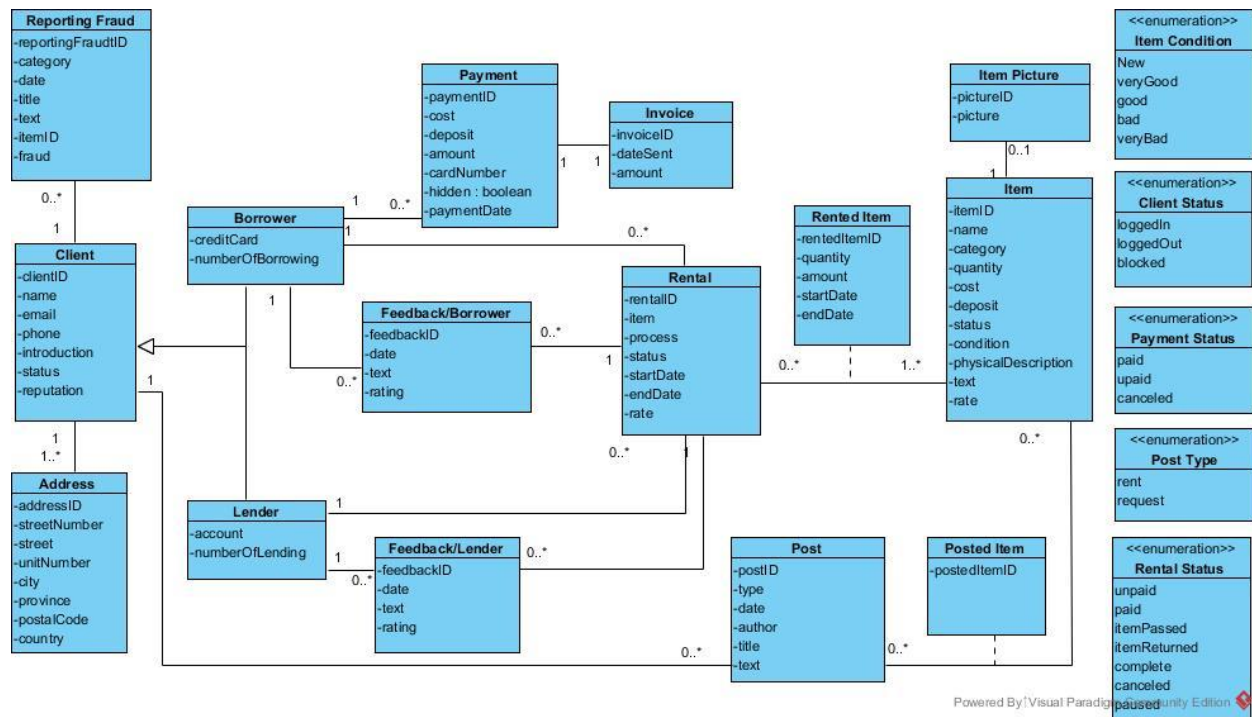
	<ol style="list-style-type: none"> 1. Client requests to create a new account 2. Client inputs ID 3. Client fills out the form 4. Client enters credit card information 	<ol style="list-style-type: none"> 1.1 System asks ID 2.1 System checks if the ID has existed in the system 2.2 System sends registration form 3.1 System validates the information 3.2 System prompts for credit card Information 4.1 System verifies authorization for credit card information 4.2 System associates client, address, credit card, and account 4.3 System returns valid client account details
Exception Conditions:	<ol style="list-style-type: none"> 2.1 ID is existed in the System 3.1 Client information is invalid 4.1 Credit card information in not valid 	

2.0 Rental Procedure Subsystem

Use Case Name:	Request an item rental
Scenario:	Client/Borrower requests to borrow the item
Triggering Event:	Client/Borrower clicks the request buttons in a post or item page.
Brief Description:	Client/Borrower requests item rental with conditions, and the system checks the conditions are available, then send the request message to Client/Lender.
Actors:	Client/Borrower
Related Use Cases:	Accept the item rental request
Stakeholders:	Client/Borrower, Client/Lender

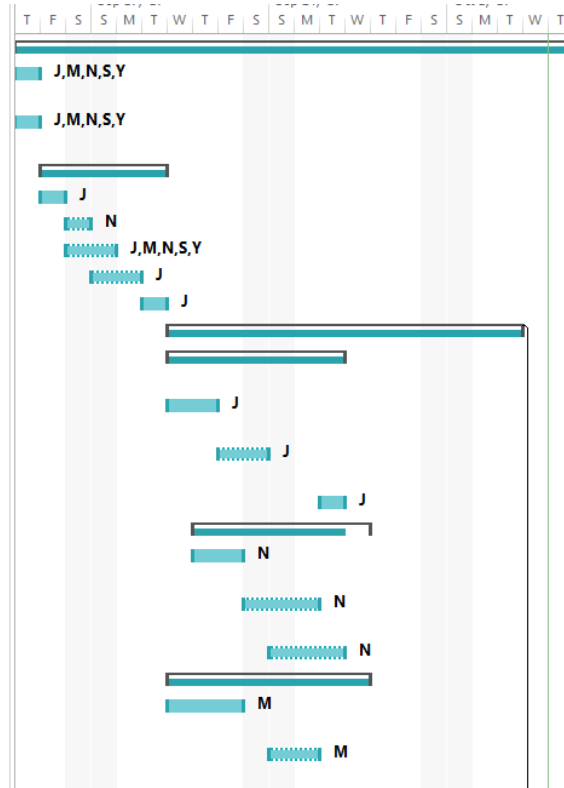
Preconditions:	Client/Borrower's account must be logged in. The item must be available.	
Postconditions:	The request message must be sent to Client/Lender.	
Flow of Activities:	Actor	System
	1. Client/Borrower clicks the button in the post or the item page. 2. Client/Borrower decides the rental dates and quantity of item.	1.1 System displays a form to borrow the item. 2.1 System check that the rental dates and the quantity is available. 2.2 System send the request message to Client/Lender.
Exception Conditions:	2.1 The rental dates or the quantity is not available.	

Domain Class



Gantt Chart

Task Name	Dur	Start	Finish	Names
Part A: Business Modelling	17 day	Thu 9/14/17	Fri 10/6/17	J, M, N, S, Y
Team building and brainstorming of project ideas	1 day	Thu 9/14/17	Thu 9/14/17	J, M, N, S, Y
Selection and confirmation of problem domain	1 day	Thu 9/14/17	Thu 9/14/17	J, M, N, S, Y
Problem Statement	3 days	Fri 9/15/17	Tue 9/19/17	J, M, N, S, Y
Stakeholders interview question	1 day	Fri 9/15/17	Fri 9/15/17	J
Problem, need, and subsystem	1 day	Sat 9/16/17	Sat 9/16/17	N
System capabilities	2 days	Sat 9/16/17	Sun 9/17/17	J, M, N, S, Y
Problem description	2 days	Sun 9/17/17	Mon 9/18/17	J
Business benefits	1 day	Tue 9/19/17	Tue 9/19/17	J
Workflows	10 day	Wed 9/20/17	Tue 10/3/17	J, M, N, S, Y
Customer Registration System and Payment System	5 days	Wed 9/20/17	Tue 9/26/17	J
Textual description and activity diagram	2 days	Wed 9/20/17	Thu 9/21/17	J
Use case tables and use case diagram	2 days	Fri 9/22/17	Sat 9/23/17	J
Revision	1 day	Tue 9/26/17	Tue 9/26/17	J
Fraud Report System	5 days	Thu 9/21/17	Wed 9/27/17	N
Use case tables and use case diagram	2 days	Thu 9/21/17	Fri 9/22/17	N
Textual description and activity diagram	2 days	Sat 9/23/17	Mon 9/25/17	N
Revision	3 days	Sun 9/24/17	Tue 9/26/17	N
Rental Procedure System	6 days	Wed 9/20/17	Wed 9/27/17	M
Textual description and activity diagram	3 days	Wed 9/20/17	Fri 9/22/17	M
Use case tables and use case diagram	2 days	Sun 9/24/17	Mon 9/25/17	M



Task Name	Duration	Start	Finish	Resource Names
Revision	2 days	Tue 9/26/17	Wed 9/27/17	M
• Posting System	8 days	Wed 9/20/17	Fri 9/29/17	S
Textual description and activity diagram	2 days	Wed 9/20/17	Thu 9/21/17	S
Use case tables and use case diagram	2 days	Sat 9/23/17	Sun 9/24/17	S
Revision	3 days	Wed 9/27/17	Fri 9/29/17	S
• Searching System	6 days	Wed 9/20/17	Wed 9/27/17	Y
Textual description and activity diagram	3 days	Wed 9/20/17	Fri 9/22/17	
Use case tables and use case diagram	1 day	Sun 9/24/17	Sun 9/24/17	
Revision	1 day	Wed 9/27/17	Wed 9/27/17	
• Domain Class Diagram	5 days	Mon 9/25/17	Sun 10/1/17	J, M, N, S, Y
Draft creation	1 day	Mon 9/25/17	Mon 9/25/17	
Draft revision	4 days	Tue 9/26/17	Fri 9/29/17	
Diagram creation	1 day	Sat 9/30/17	Sat 9/30/17	
Diagram revision	2 days	Sat 9/30/17	Sun 10/1/17	
• Technology tools for Software Development	2 days	Mon 10/2/17	Tue 10/3/17	J, M, N, S, Y
Initial compilation of technologies	1 day	Mon 10/2/17	Mon 10/2/17	
Interactive compilation of technologies	1 day	Tue 10/3/17	Tue 10/3/17	
Compilation of all deliverables	2 days	Wed 10/4/17	Thu 10/5/17	J, M

