



Online DVD Rental Requirements Report

Written by:

C4

Gabriele Camarda
Resom Michael
Egidijus Vaiciunas
Nuchem Katz
Abdulnour Dualeh
Lukasz Frankowski
Khaled Laraba

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Business requirements

Business requirements:

The business goals, objectives and needs for the online DVD rental store is to create a profit, increase number of customers and provide a seamlessly working online system in which users can rent movies, including providing the users with various methods of payment and ensuring that every rental is kept track of, that the system is user friendly and interactive. Memberships would be necessary, meaning the company's system would only provide its services for those who are subscribed.

Business model:

Our DVD-by-mail business model is built around subscription paying members and subscription packages are offered based on numbers of DVDs rented. Subscriptions are charged monthly. Members can rent DVDs as per the following plans:

- 1 at a time, 2 per month at £6.00/m
- 2 at a time, 4 per month at £8.00/m
- 2 at a time, 6 per month at £10.00/m
- 2 at a time, unlimited per month at £13.00/m

DVDs can be kept for as long as the customer would like, with no additional charge. The limit is imposed only on the number of media that can be rented at once.

For sake of clarity, 'media' or 'items' refer not only to DVDs but also to Audio and Video CDs, Video Games and other types of media.

Members are required to first return media they've rented, via mail, in the provided prepaid envelope, in order to be able to hire new media.

Customers Mission Statement:

As a film industry, taking advantage of e-applications and in general automation, in the business model that we use, has greatly increased efficiency and productivity at our company. For example, the use of bar codes and RFID tags on our DVDs, database categorization of different movie genres and the electronic tracking of stock has made it easier to operate on a bigger scale with fewer expenses. We think that further opportunities are possible with the implementation of an automated online movie hiring system that can also handle pre and post conditions such as membership and returns. Such a system would also in general maximize fast, unfailing deliveries and order processing. The system can then be exploited to also cater for extras such as reservations, suited platform for a more detailed and visual description of the products we offer, and marketing in a way that would reach a bigger audience. Our intent for the future would then be to grow our online DVD renting membership and to provide a modern sophisticated service that could compete in the online industry that film is today.

System

Actor List

1. Customer or Visitor: can refer to a member or non-member.
2. Member: A customer who's joined the rental service, on a periodic subscription, by providing some form of electronic payment and is therefore able to enjoy the services we offer.
3. Non-Member: A customer who's not yet joined membership and cannot enjoy any of our services apart from browsing our online catalogue and subscribe.
4. Administration: An automated component in our system that represents an administration role i.e. has access to clients' rental and reservation history and also to some information on their account; updates a client's quota after a client rents or returned an item and updates the online catalogue. They would also manually deal with payments by being in between our system and the bank that takes payment but that's beyond the boundaries of our automated system.
5. Warehouse: An automated component in our system that represents a typical Warehouse Assistant role, i.e. who deals with dispatching orders and processing returns and . He gets notified by Administration when DVDs or video games are ready to be dispatched.

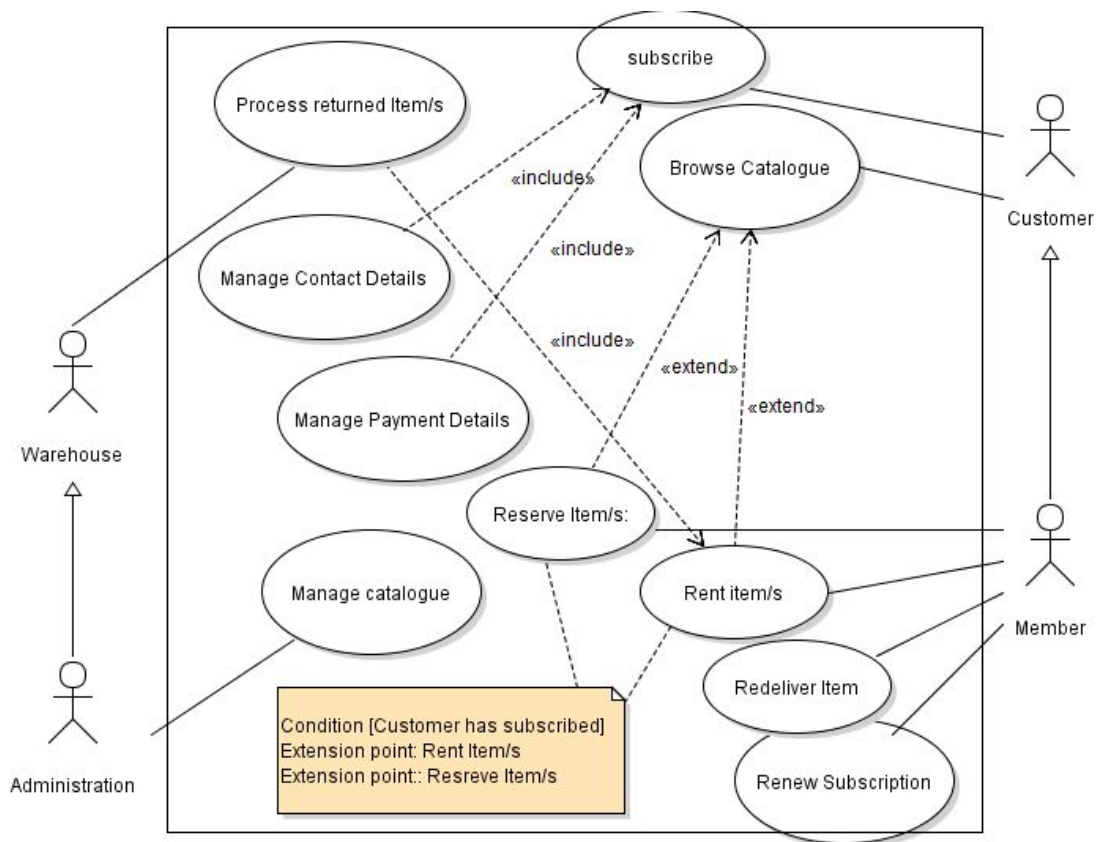
Use Case List

1. Browse Catalogue: A customer browses the catalogue for films, television shows or video games that are available to hire to view the item in more detail or, if they're a member, to hire the item.
2. Subscribe: A non-member joins by filling out a subscription form, that would allow them to hire films, TV shows and Video games on a subscription bases.
3. Manage Contact Details: A member can view or change (and, apart from the last one, an admin employee can view) their address, contact details and account password.
4. Manage Payment Details: A member can view or change their payment details, set preferred payment method and add payment method.
5. Renew Subscription: A member change their subscription type or cancels it. Here too they will get the chance to change their payment or contact details.

6. Reserve item/s: A member reserves an item either because it's currently rented out to someone else or because they want to hire it in the next few days but don't want someone else to hire it before they do. They can reserve it for a maximum of 7 days. They can also cancel it any time before.
7. Rent item/s: A member hires media that they have selected from those available, their quota is updated, rental is dispatched and a history of it is recorded in the system.
8. Process returned Item/s: The warehouse has received a return from a customer, it will be processed by Warehouse in order to update quota and number of stock (and be checked that they're in good state.)
9. Manage catalogue: Upon receiving a return from a customer, buying new stock or ridding obsolete stock, Administration would edit the catalogue and introduce the necessary changes, marking item available again, removing item or adding
10. Redeliver Rental: If a member receives a media, they've rented, in the post and the item is damaged or if the media they've rented did not arrive at all, they fill out a form online which allows the system to send them a new one.

Disclaimer: although we have identified more UseCases, as seen later in the class diagrams, we've not had a chance to explore them all in details nor to always separate them into their own independent use case.

Use Case Diagram

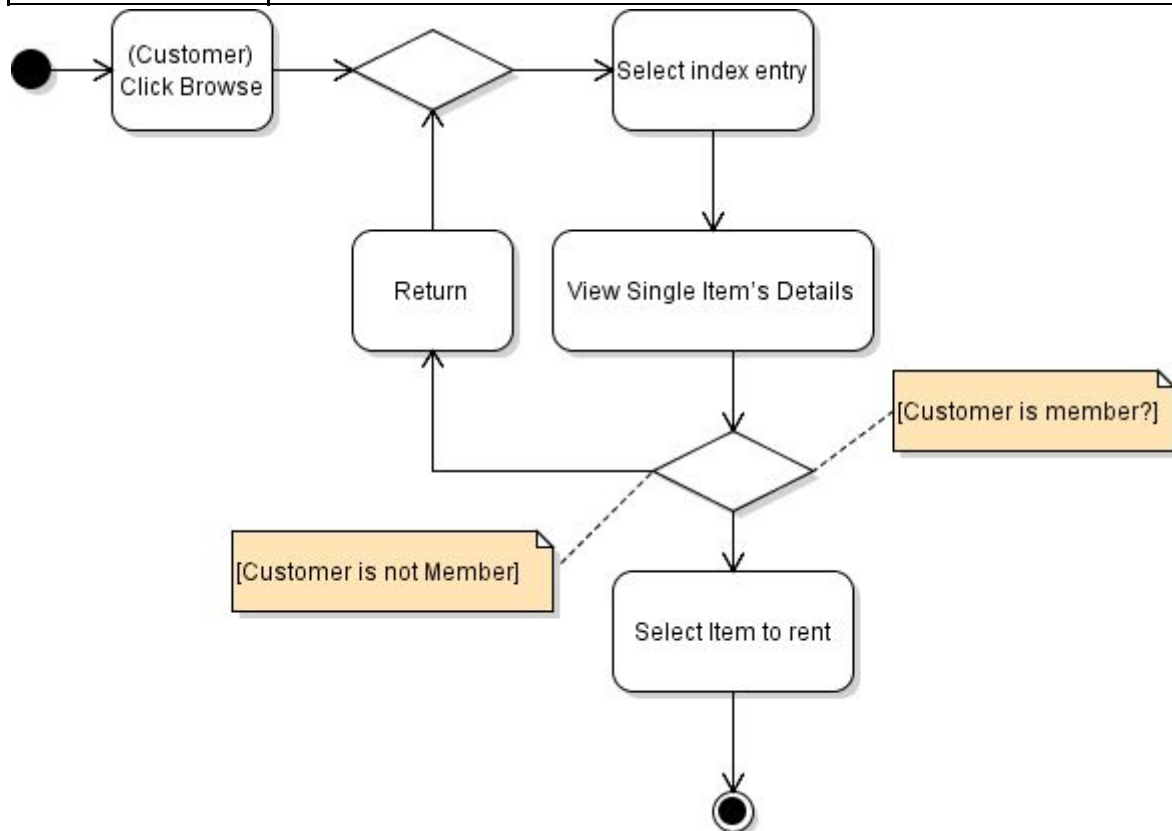


Use Case Descriptions and Activity Diagrams

Each Activity diagram follows its Use Case Description table

Use Case	Browse Catalogue
Brief Description	A customer browses the catalogue for films, television shows or video games that are available to hire.
Actors	Non-member, Member
Preconditions	The Customer (non-member, member) points an Internet browser to the browse page on the company website. where the page will show the current available movies, tv shows and video games.
Main Flow	<ol style="list-style-type: none"> 1. Customer browses available DVDs 2. Customer selects desired DVDs or video games to view details 3. Customer may proceeds to checkout 4. or Customer may return to look at another media

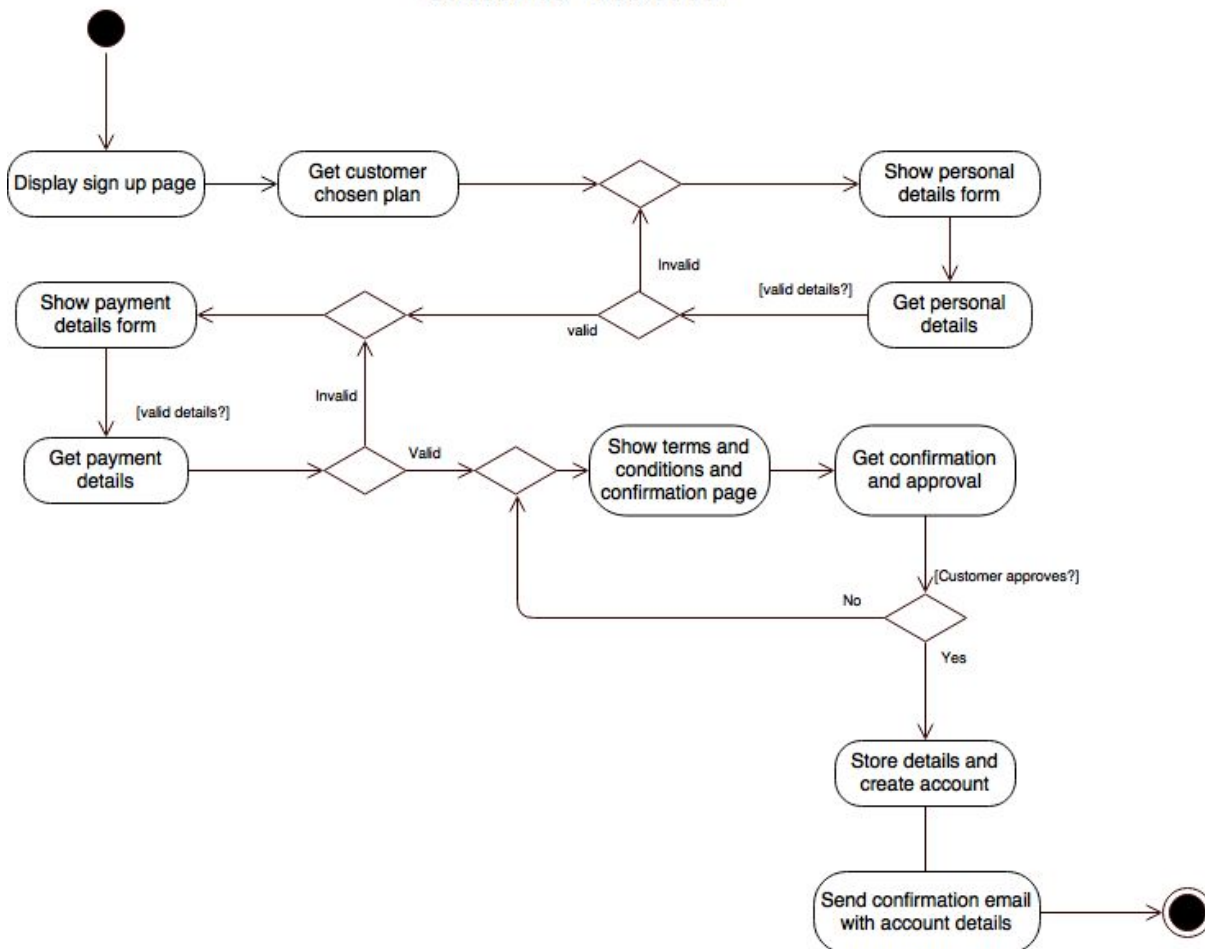
Alternative Flows	<ul style="list-style-type: none"> The customer already knows what title they are looking for and searches for their desired title in the search box. The customer doesn't like the titles offered and decides to move on to another service
Postconditions	If the customer decides to proceed with 'hire', redirect the customer to a rent page to rent the selected DVDs.



Use Case	Subscribe
Brief Description	A non member joins by filling out a subscription form to become a member on a subscriptional bases.
Actors	Non-member
Preconditions	This use case takes place when the customer accesses the website and navigates to the subscribe page.
Main Flow	<ol style="list-style-type: none"> 1. Customer enters personal details. 2. Customer selects the preferred subscription plan. 3. Customer enters payment details. 4. Customer Address is validated (by othe by other system with

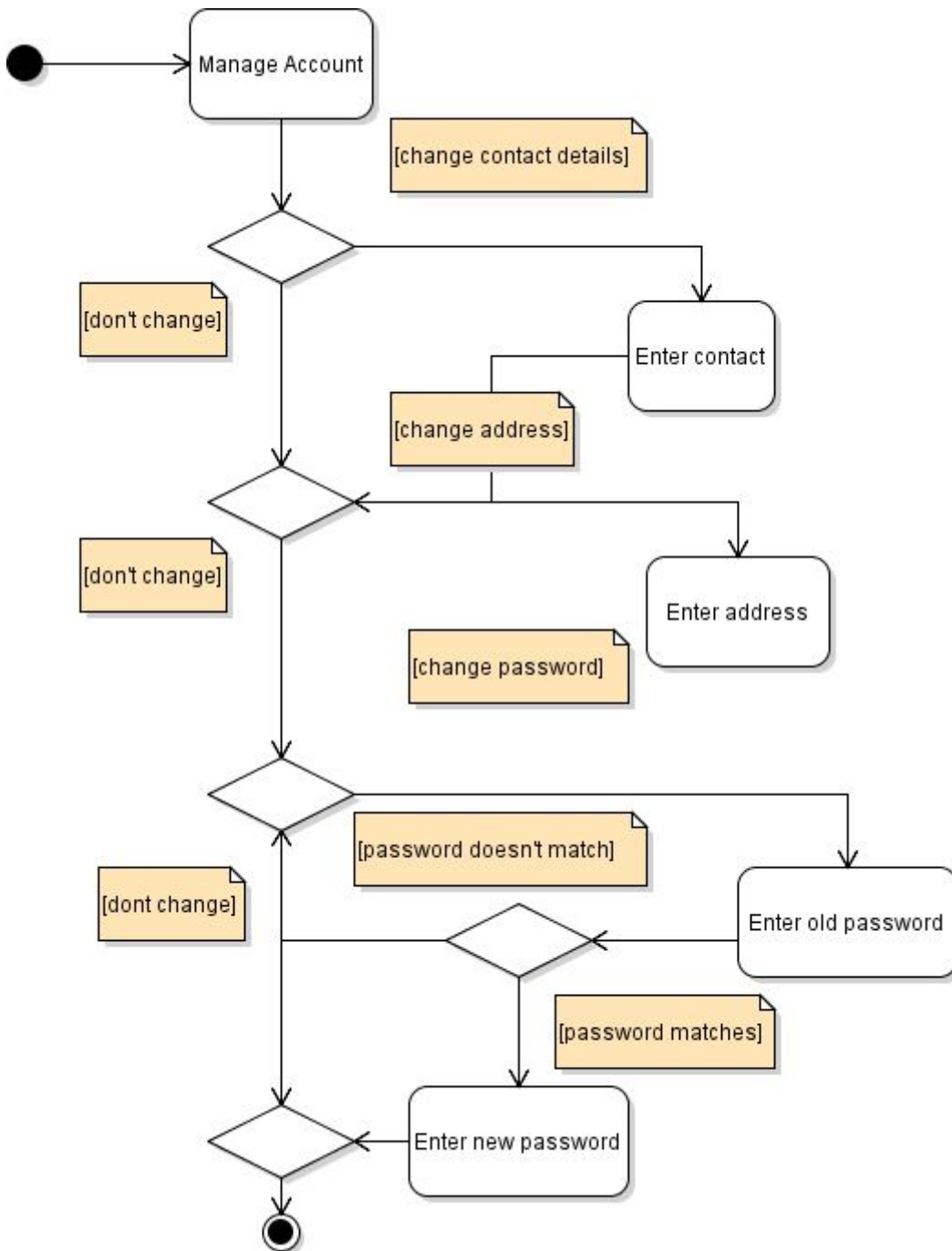
	<p>human in between)</p> <p>5. Customer payment details are validated (by other system with human in between)</p> <p>6. if both are validated, Customer is asked to approve and Membership is created</p>
Alternative Flows	
Postconditions	An account is created for the customer.

Subscribe - use case



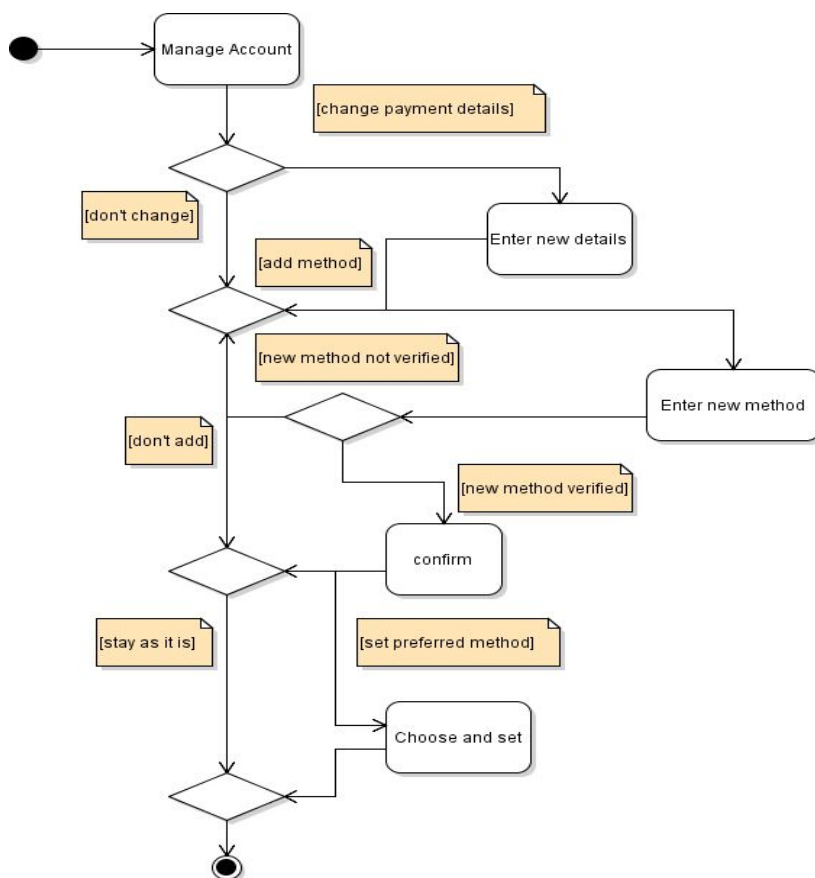
Use Case	Manage Contact Details
Brief Description	Manage Contact Details: A member can view or change (and an admin employee can view) their address, contact details and account password.

Actors	Member, Administration
Preconditions	Member must have a valid account and be signed in
Main Flow	<ol style="list-style-type: none"> 1. Member opens the Manage Account page 2. Member chooses to change contact, address details or password. 3. Member confirms. (Eg for password, they'd need to show that they know the old password, and saves the updated details.)
Alternative Flows	<ul style="list-style-type: none"> • An employee in the Administration team is choosing to look up a member's address or contact details or is resetting customer's password. They should not have the option to make changes to contact and address details nor to view the customer's password.
Postconditions	<ol style="list-style-type: none"> 1. That the address is valid, is verified (via external system but reflected onto our system afterwards). 2. Updated details are stored.



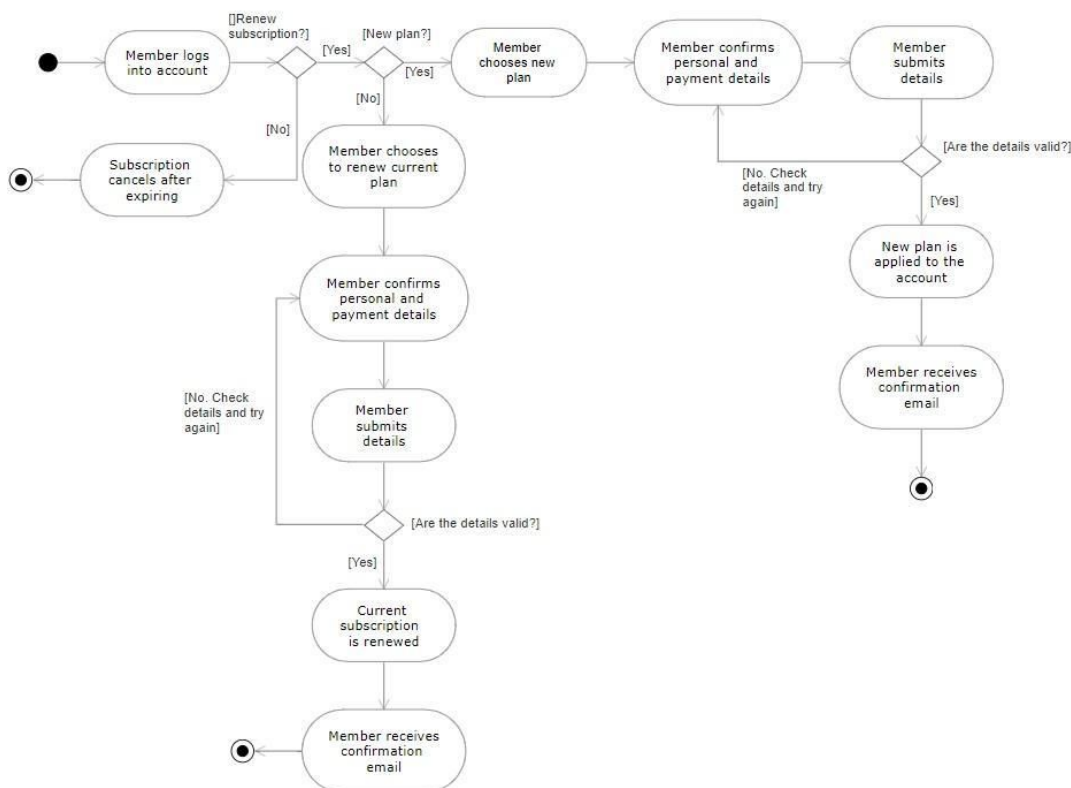
Use Case	Manage Payment Details
Brief Description	A member can view or change their payment details, set preferred payment method and add payment method.
Actors	Member, Administration
Preconditions	Member must have a valid account and be signed in

Main Flow	<ol style="list-style-type: none"> 1. Member opens the Manage Account page 2. If Member chooses to change their current payment details or add a new payment method they would enter for eg the card number, expiry date and ccv code. 3. Customer's payment details are verified (externally) 4. If more than one payment method, the Member would chooses which one is their preferred way of paying, eg among several cards 5. Member confirms and saves the updated details.
Alternative Flows	Administration looks up to check payment method is in tact.
Postconditions	New details are stored



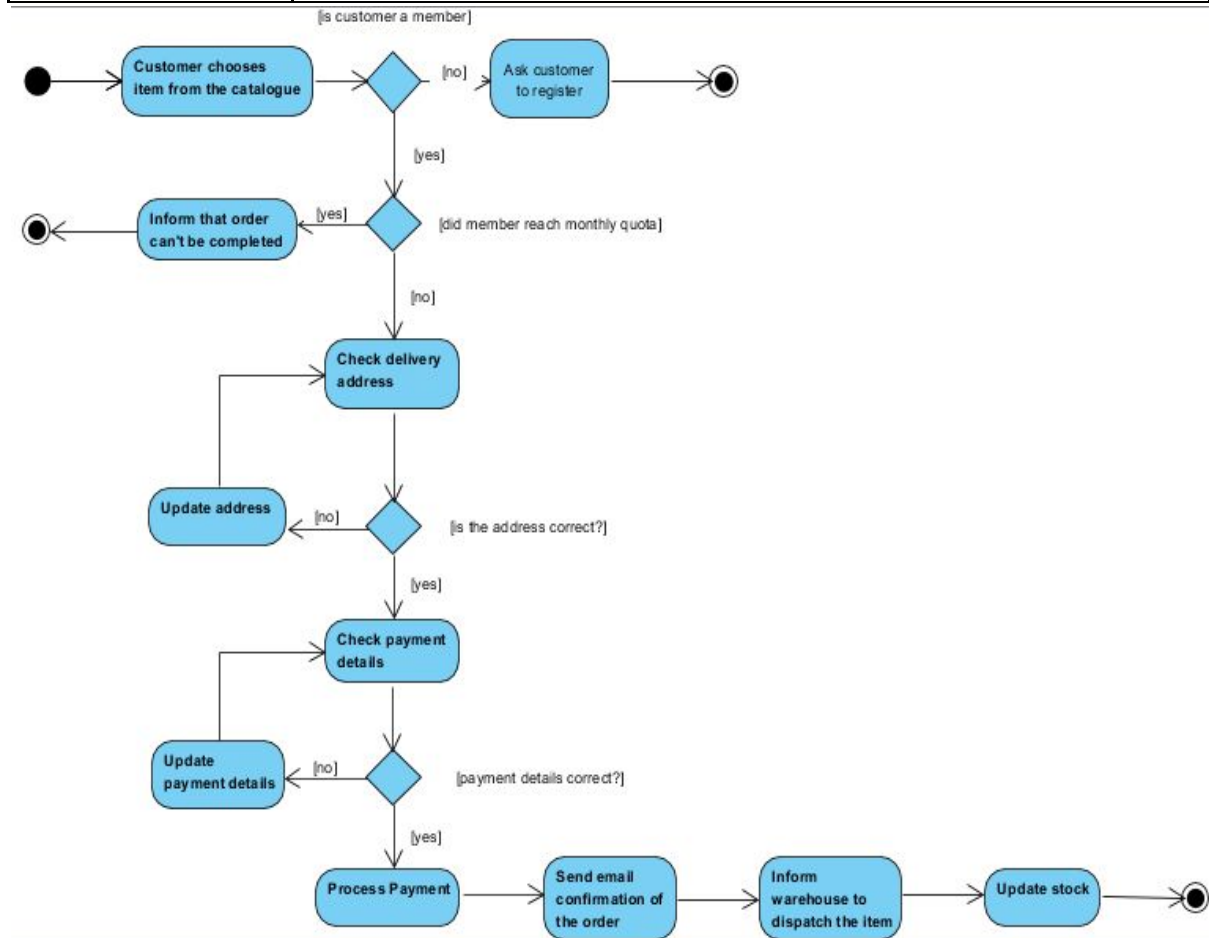
Use Case	Renew Subscription
Brief Description	A member renews their subscription or cancels it.
Actors	Member,

Preconditions	Must be a valid member and be signed in.
Main Flow	<ol style="list-style-type: none"> 1. Member chooses whether to remain on the same plan or select a new one. 2. Member reviews personal details and payment details, which they may choose to update. 3. Member confirms and submits details.
Alternative Flows	The member decides to cancel their membership when payment method is still in tact.
Postconditions	If the use case is successful the member will retain their membership or the selected one. They will receive a confirmation email from an employee confirming their renewal.

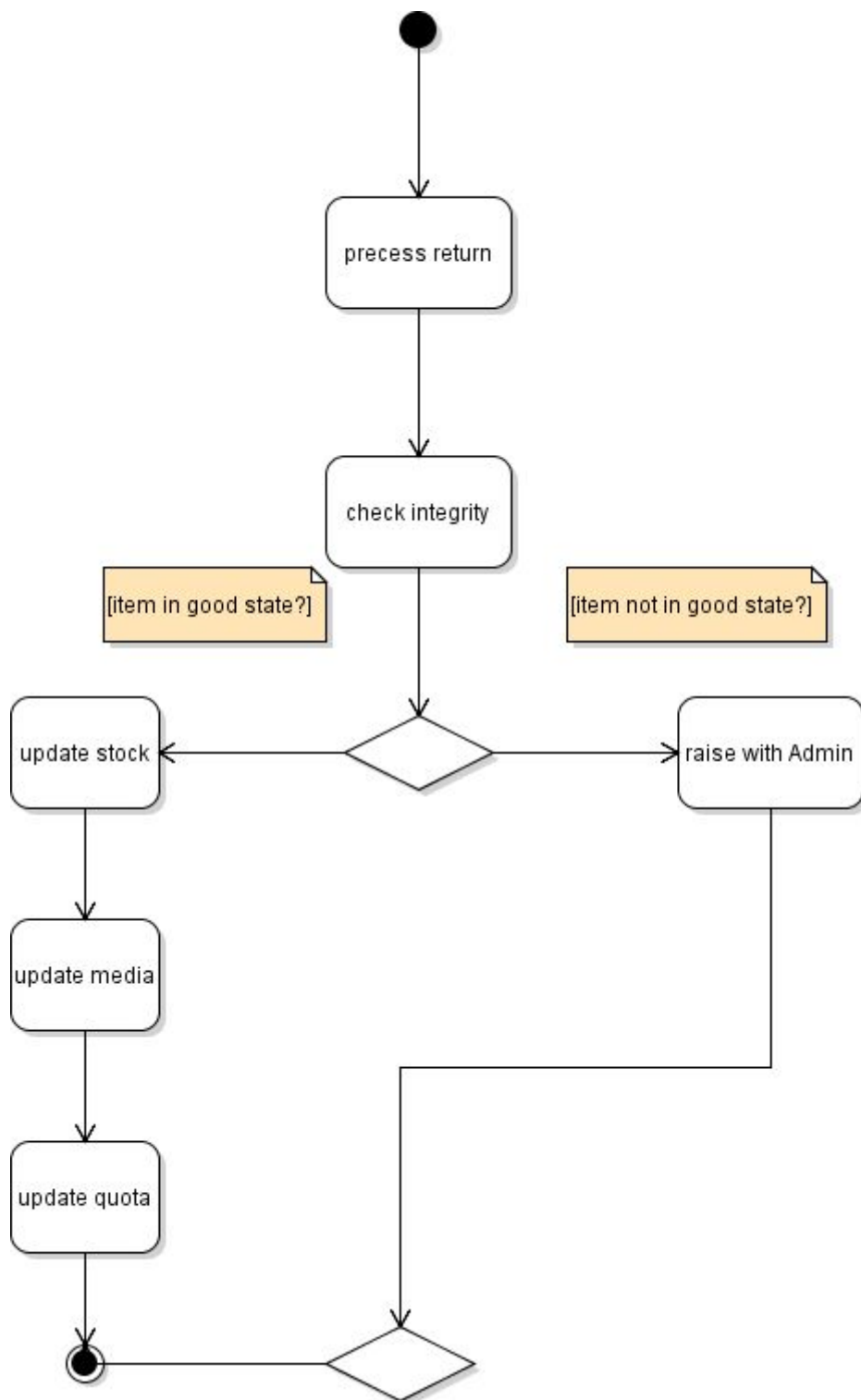


Use Case	Rent Item/s
Brief Description	A member hires a film, Tv show or Video game etc, that they have selected from those available.

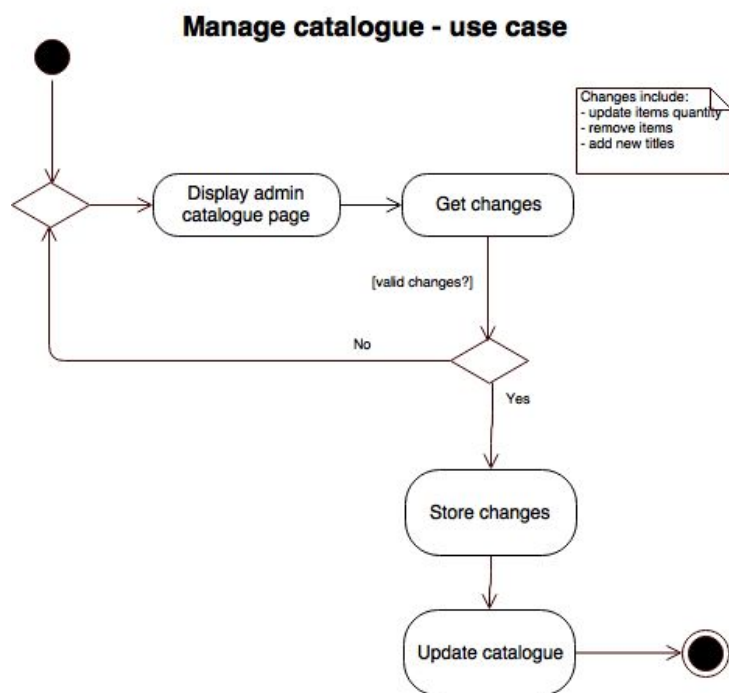
Actors	Member, Warehouse, Administration
Preconditions	Must be a valid and signed in member. Member must have not reached the quota. Stored payment details must be valid and verified.
Main Flow	<ol style="list-style-type: none"> 1. Member chooses media they wish to rent from the catalogue. 2. Member confirms delivery address. 3. Member checkouts. 4. Warehouse is notified so that items are dispatched and stock updated. 5. Administration is notified so that quota is updated
Alternative Flows	
Postconditions	If successful, a member of the team emails the member, order details with a reference number and instructions on how to return the items.



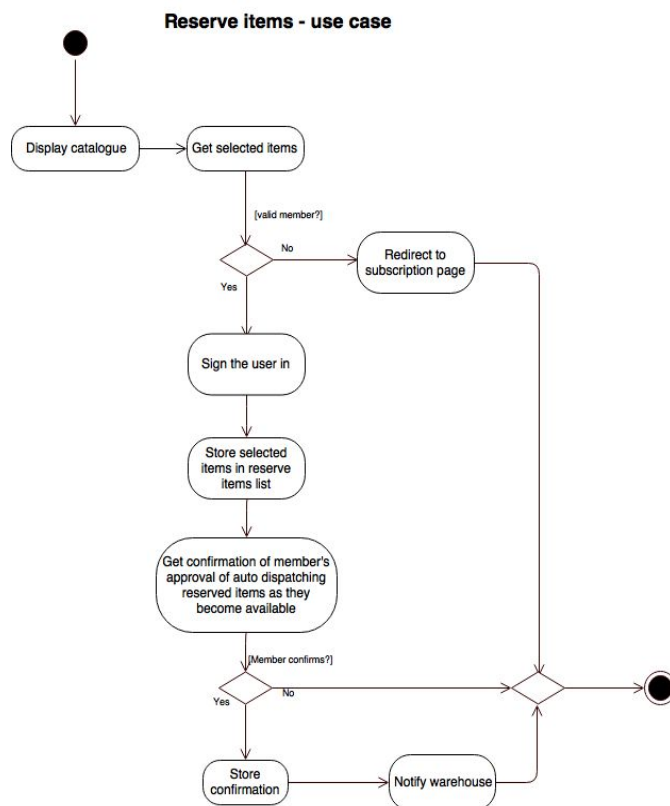
Use Case	Process returned item/s
Brief Description	The Warehouse receives returned media items from a member and updates stock. Checks that the media returned are in aren't damaged. Administration updates quota of member and updates media.
Actors	Member, Warehouse, Administration
Preconditions	Rental reference number must be provided.
Main Flow	<ol style="list-style-type: none"> 1. Warehouse receives items and checks their integrity. 2. Warehouse updates number of stock. 3. Administration updates quota. 4. Administration updates media to reflect that media is now available for hire again.
Alternative Flows	If returned items are damaged or returned items are defective this, Warehouse would flag it with the Admin team who would handle it manually .
Postconditions	None



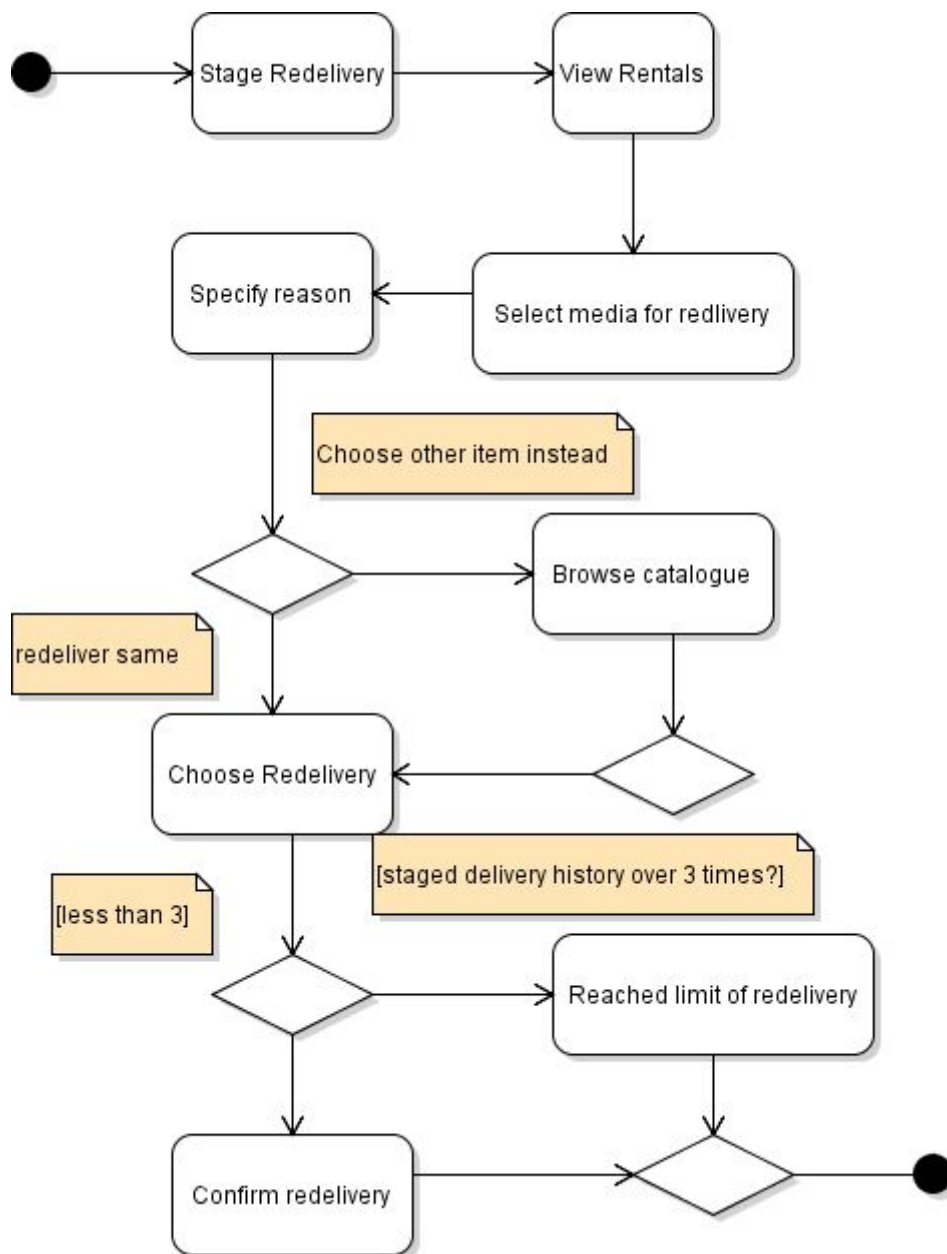
Use Case	Manage catalogue
Brief Description	Administration can view or update catalogue items.
Actors	Administration
Preconditions	Administration must a valid account and be logged in
Main Flow	<ol style="list-style-type: none"> 1. Administration accesses the admin page for catalogue details. 2. Administration make changes. 3. Administration confirms and submits the new changes.
Alternative Flows	
Postconditions	None



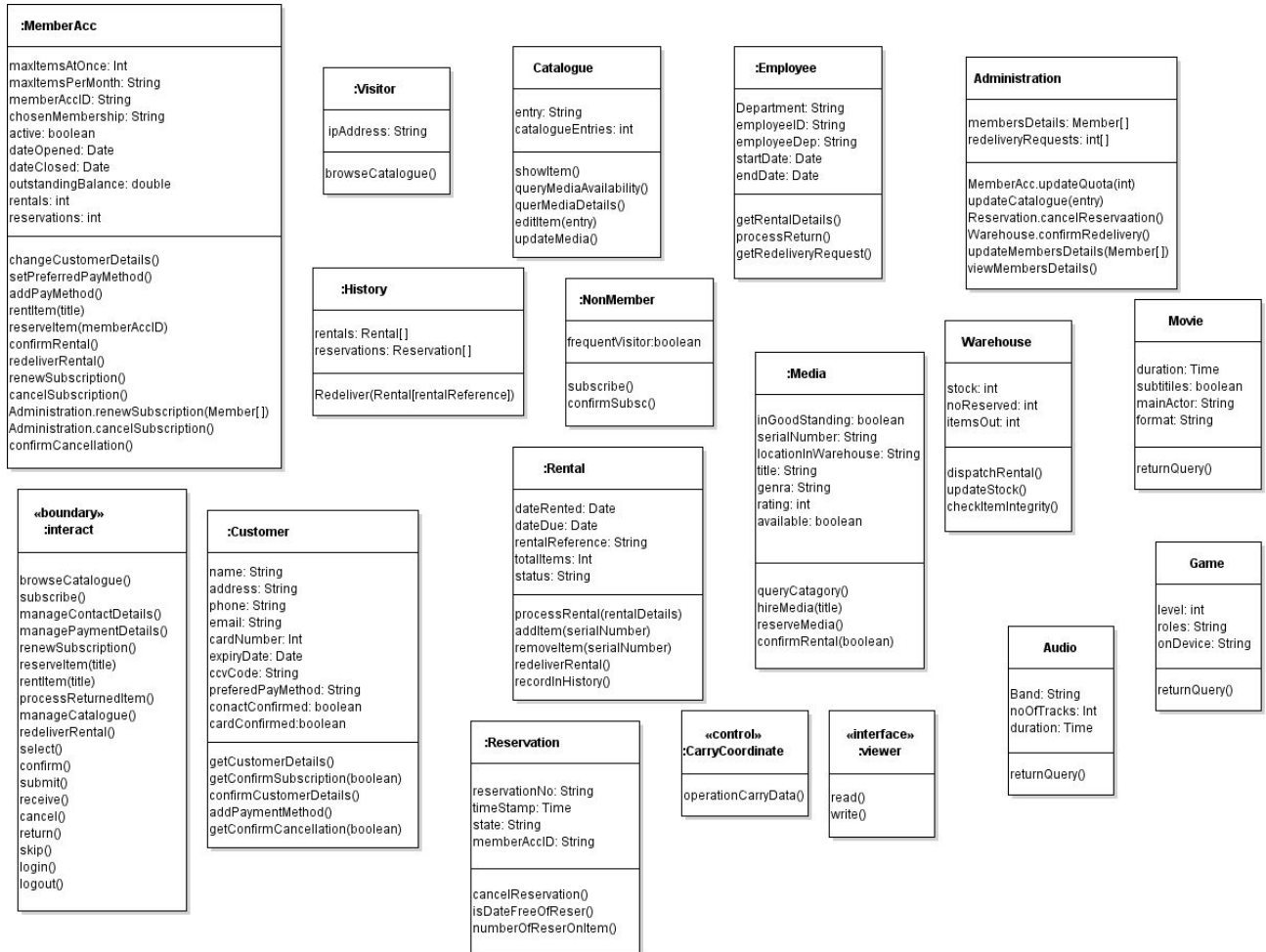
Use Case	Reserve Item/s
Brief Description	A member reserves a film, Tv show or Video game etc, that they have selected from those available.
Actors	Member, Warehouse
Preconditions	Must be a valid and signed in member.
Main Flow	<ol style="list-style-type: none"> 1. Member chooses to rent media 2. System tells member media is not available 3. Member decides to reserve the items instead 4. Member decides to have item dispatched as soon as they become available
Alternative Flows	Member reserves media before trying to rent it, possible just to save the item for when they can afford it, within the next few days.
Postconditions	If autodispatch is selected, the Warehouse is notified to dispatch the items as soon as they become available.

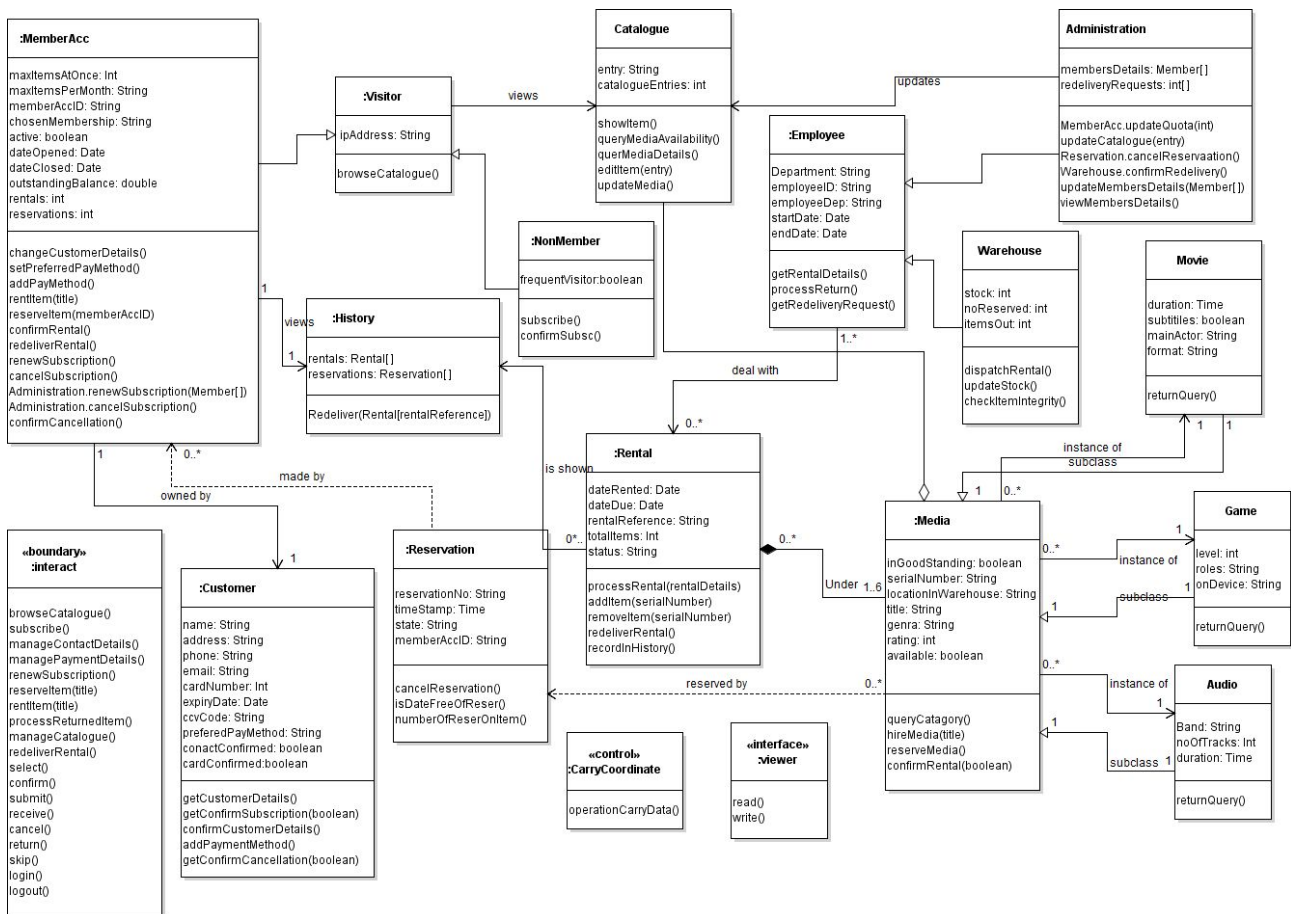


Use Case	Redeliver Rental
Brief Description	If a member receives a media, they've rented, in the post and the item is damaged or if the media they've rented did not arrive, they fill out a form online which allows the system to send them a new one.
Actors	Member, Administration, Warehouse
Preconditions	Must be a valid and signed in member.
Main Flow	<ol style="list-style-type: none"> 1. Member navigates to Stage Redelivery page. 2. From a list of their rentals and items they included, Member selects the media of the rental they want redelivered. 3. For "Reason", member picks either 'Not arrived' or 'Faulty'. 4. Member chooses 'Redelivery'. 5. If it's less than 3 times, the system confirms Redelivery 6. Else, the system tells the client they've gone over the limit and need to reset via talking to an admin. 7. Warehouse and Administration are notified 8. Warehouse dispatches the same items again (or different, if customer selects to swap). 9. Administration updates quota
Alternative Flows	<ul style="list-style-type: none"> • Member decides not to have another dispatched instead. • Member decides to browse to choose a different media for redelivery, in which case, after selecting, it would return them to the same page to confirm redelivery.
Postconditions	In case of 'item not arrived' the mail service would be contacted to and in the case of faulty, an employee would later check that faulty item reported has been returned



Class diagrams



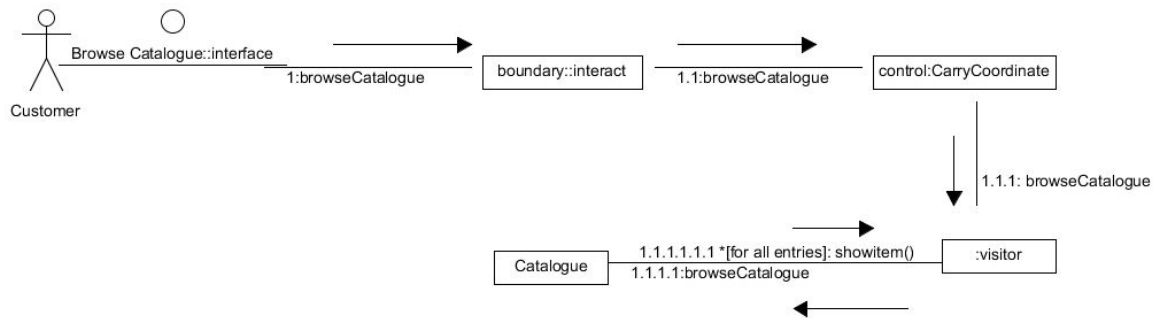


Each Communication diagram follows its written description.

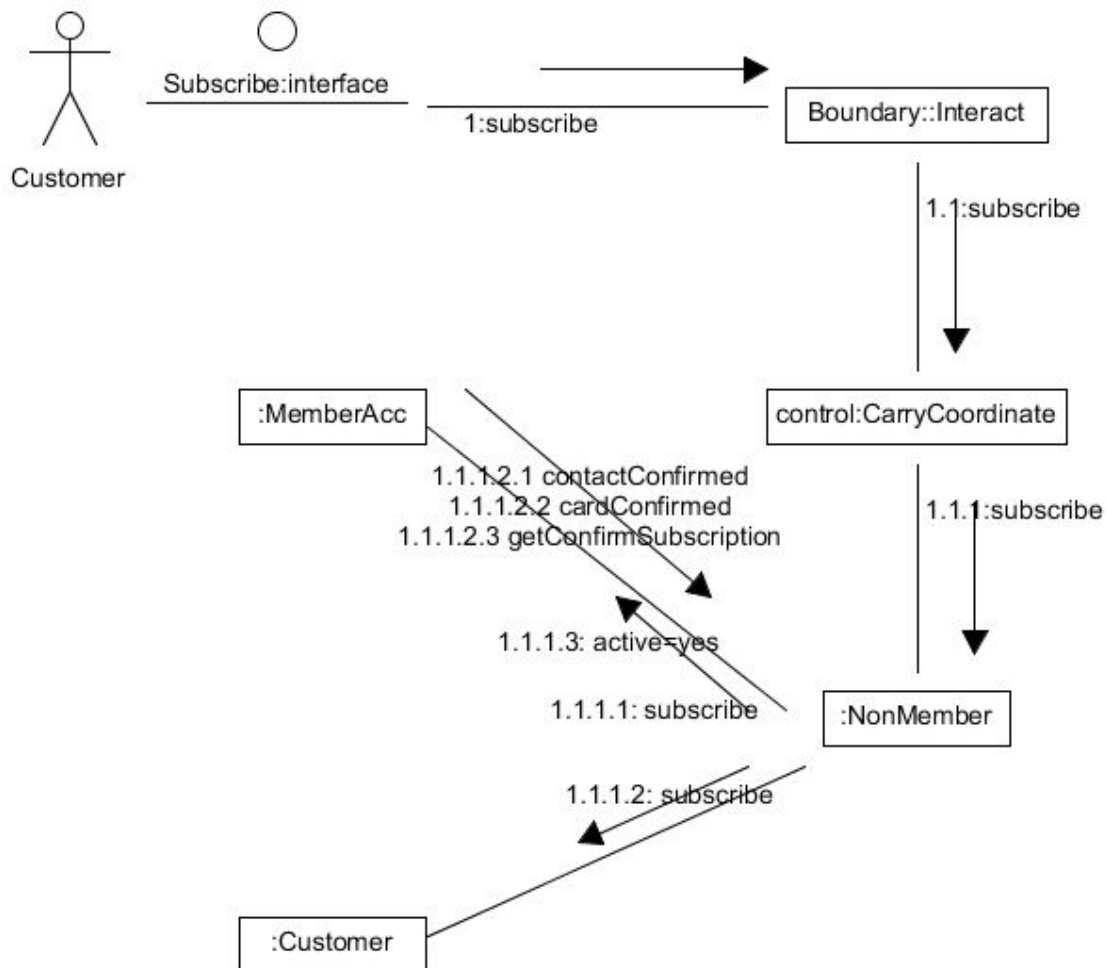
Every complete set of interactions includes the **Viewer** Interface of that Use Case at the beginning and at the end.

Interactions of classes:

- browseCatalogue() from Visitor to Catalogue that **returns** attribute *entry* with operation showItem()
 - [via , Boundary Interact, select(), confirm(),submit()]



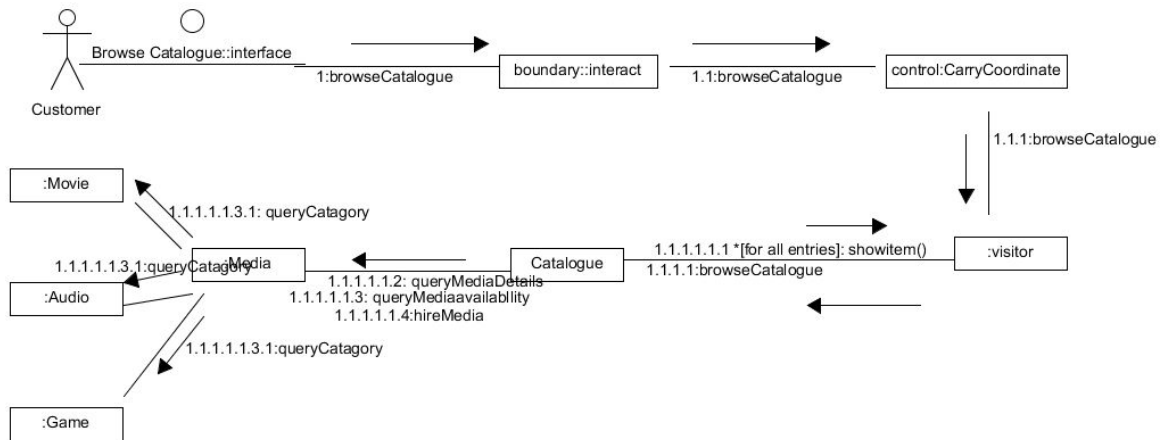
- *Subscribe(name, address, phone, email, cardNumber, expiryDate, ccvCode, preferredPayMethod, chosenMembership)* from NonMember to Customer and MemberAcc, entity classes/objects.
 - [via Control CarryCoordinate who would separate and select attribute chosenMembership to go to MemberAcc.]
 - Customer, after an assistant validates payment and contact details, against outside system, it **returns** attributes *contactConfirmed* and/or *cardConfirmed*. Subsequently, operation *getConfirmSubscription(boolean)*, sends a message back to the calling operation in *nonMember*, asking the user to confirm that they want to subscribe, if yes, the *active attribute* in *MemberAcc* would be set to *yes as well as* all the other attributes in Customer and in MemberAcc. (apart from *dateClosed*).



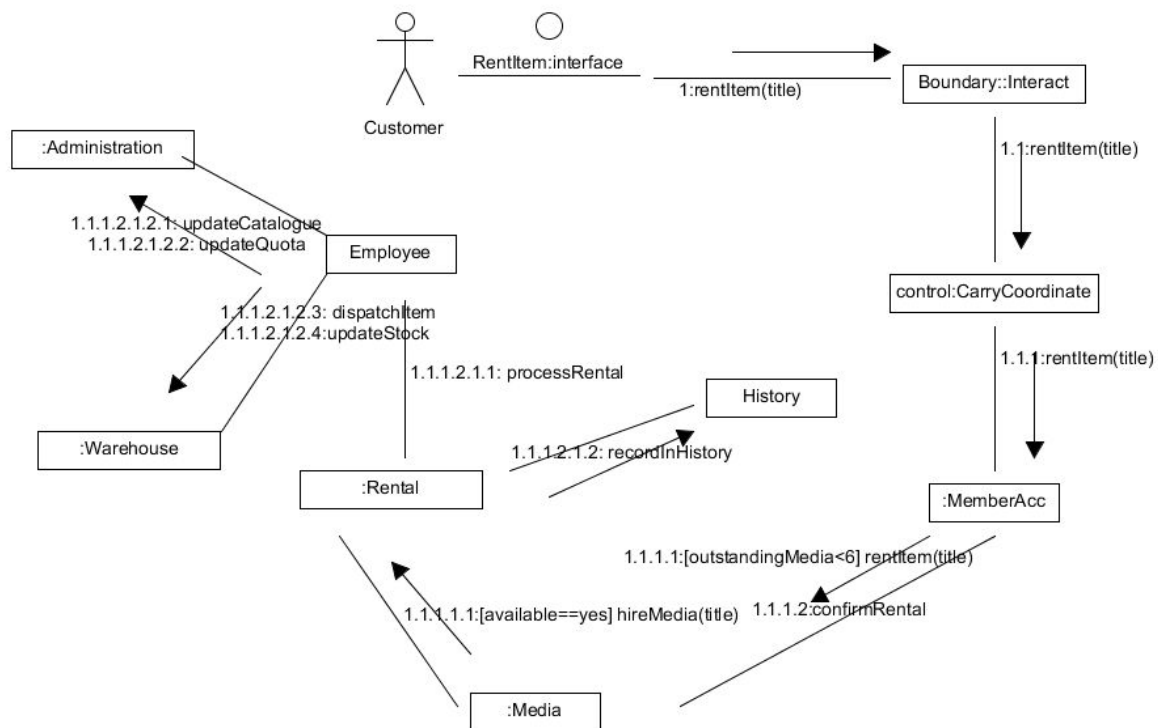
Interactions of classes:

Rent Item/s, Reserve Item/s and extension of Browse Catalogue

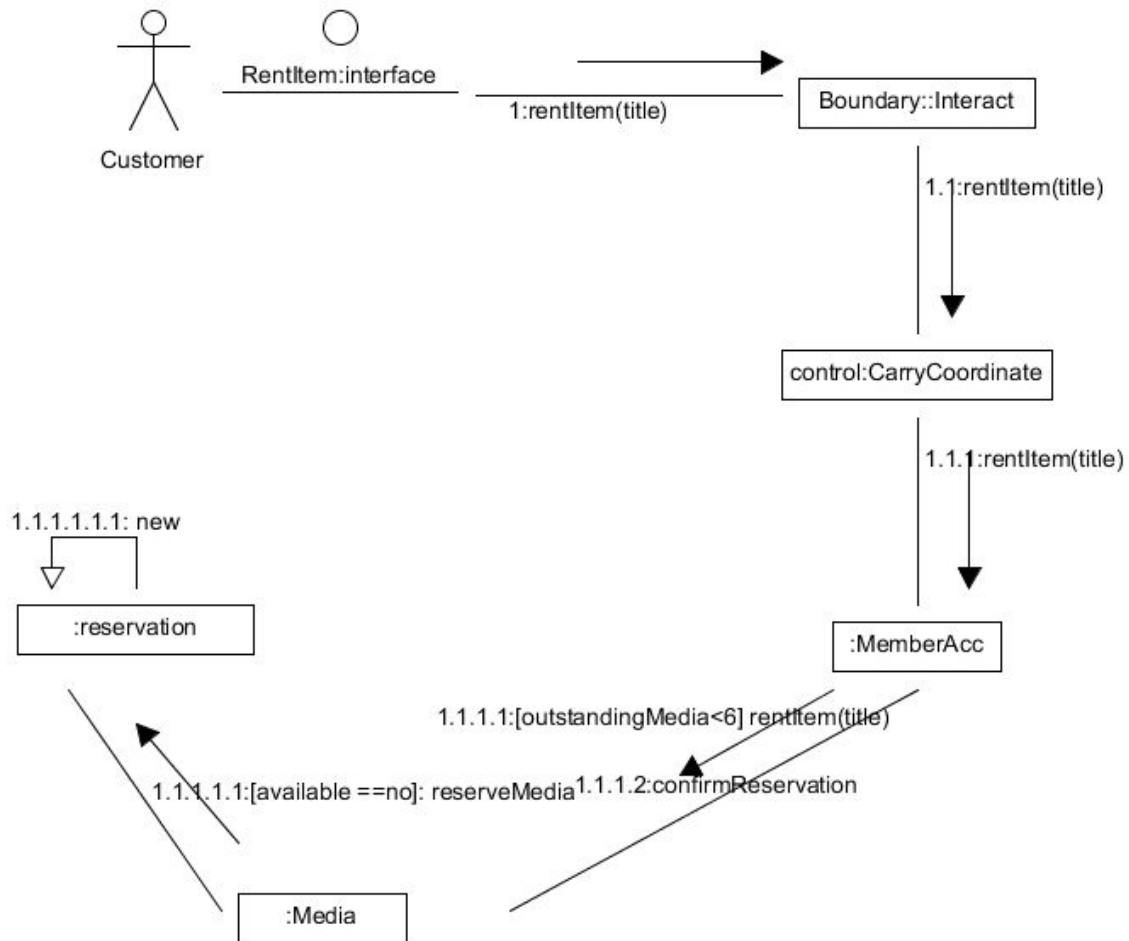
- Ext of BrowseCatalogue: queryMediaAvailability(*entry*) or queryMediaDetails(*entry*) from Catalogue travels to Media that through operation queryCatagory(*entry*) queries Game's, Movie's or Audio's returnQuery() to get further details, and attributes *title*, *genre*, *rating*, *available* together with the attributes that Game, Movie and Audio hold, depending on the type of media queried. The two queries in Catalogue in turn, return those values back to Visitor. This may then excelate to hireMedia(*title*) or reserveMedia(*title*).



- Rent Item/s: rentItem(*title*) from MemberAcc to Media, hireMedia(*title*) checks first in MemberAcc, the attributes *maxItemsAtOnce*, *outstandingMedia*, *dateOpened* *maxItemsPerMonth*; It then travels to Media, checking attribute *available*, of this particular media, whether it's not hired out, if not, it creates object in Rental, sets Rental's attributes accordingly, apart from the attribute *status*, and Media's attribute *available*, which is only set after member hits confirmRental() from MemberAcc. If it is hired out, member is given option to reserve.
 - Each time a member stages a rental, they can execute operation confirmRental() which indicates their rental object creation is completed.
 - processRental() in Rental, would go to Employee, getRentalDetails(), with details of the rental and media/s included, which Warehouse would need for sidpatchRental() and updateStock() and Administration would need for MemberAcc.updateQutoa(int) and updateCatalogue().

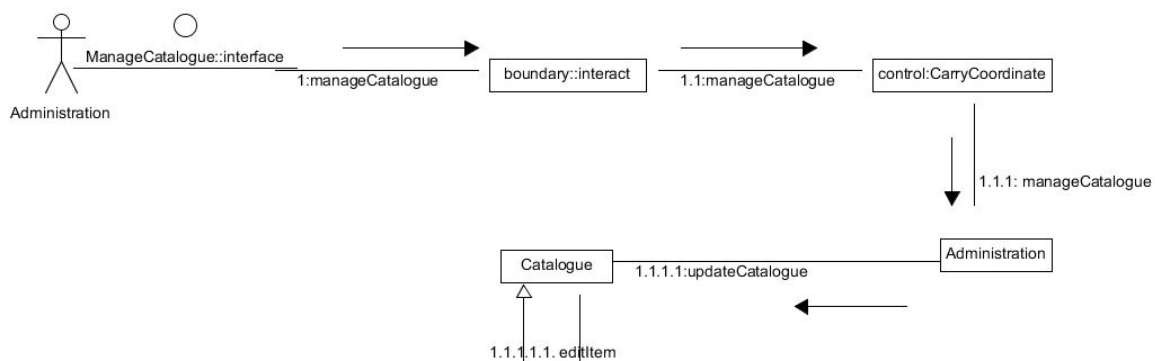


- Reserve Item/s: Usually, when attribute *available* in Media returns *no*, the operation `reserveItem()` of Media would be invoked, travel to MemberAcc the give option to reserve. In turn, `reserveItem(memberAccD)` travels to Reservation and sets all of Reservations attributes accordingly.
- Alternatively, operation `reserveItem(memberAccD)` can directly be invoked to record a media as reserved in Reservation, such as when a member want to reserve not because the media is currently hired out.



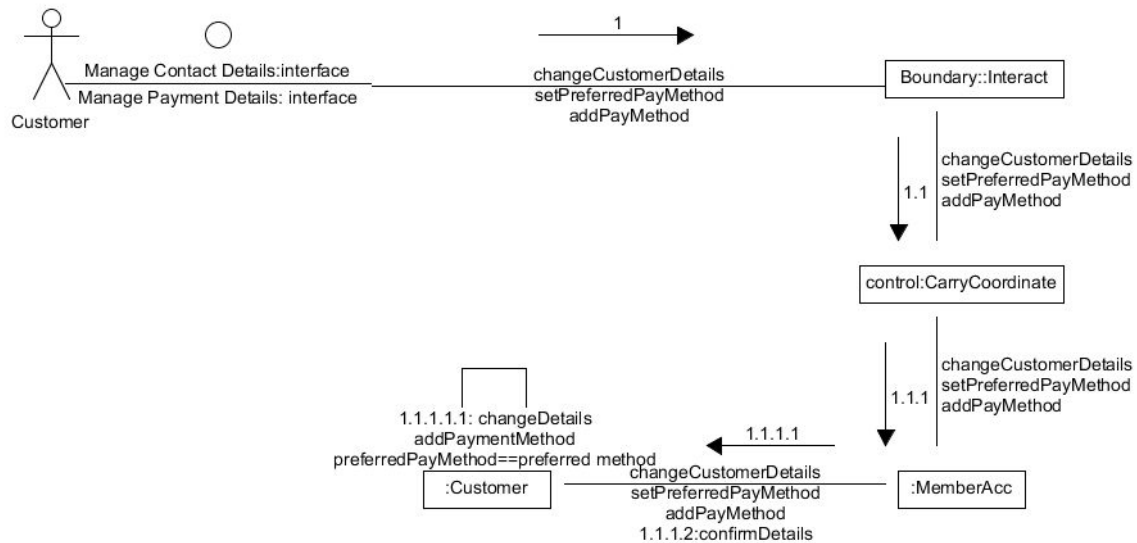
Manage catalogue

updateCatalogue(entry) in Administration to editItem(entry) of Catalogue.



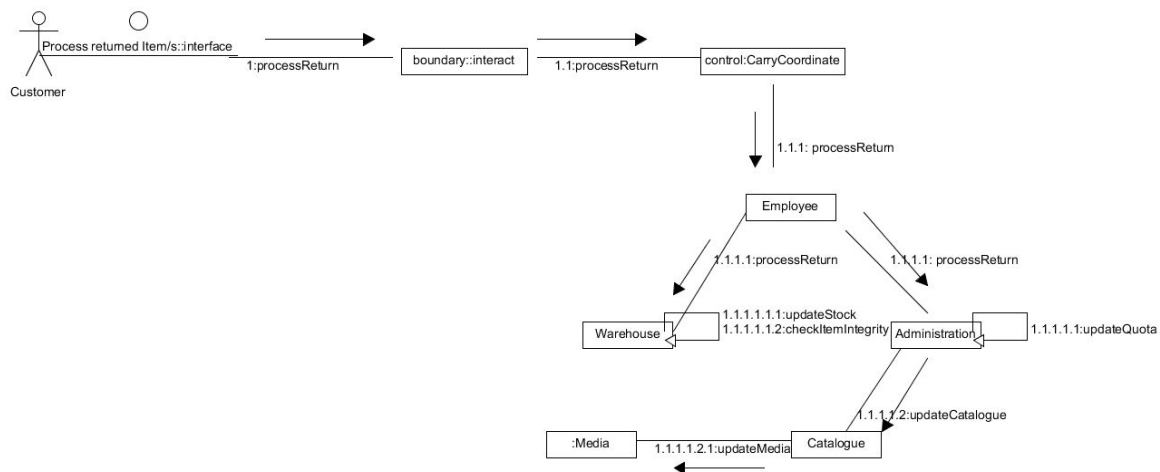
Manage Contact Details and Manage Payment Details

Operations changeCustomerDetails(), setPreferredPayMethod() if/and addPayMethod() from MemberAcc to methods getCustomerDetails(), addPaymentMethod() and setting of attribute *preferredPayMethod* in Customer. Again, before update, new details would have to be updated in before taking effect in class Customer, via external system.

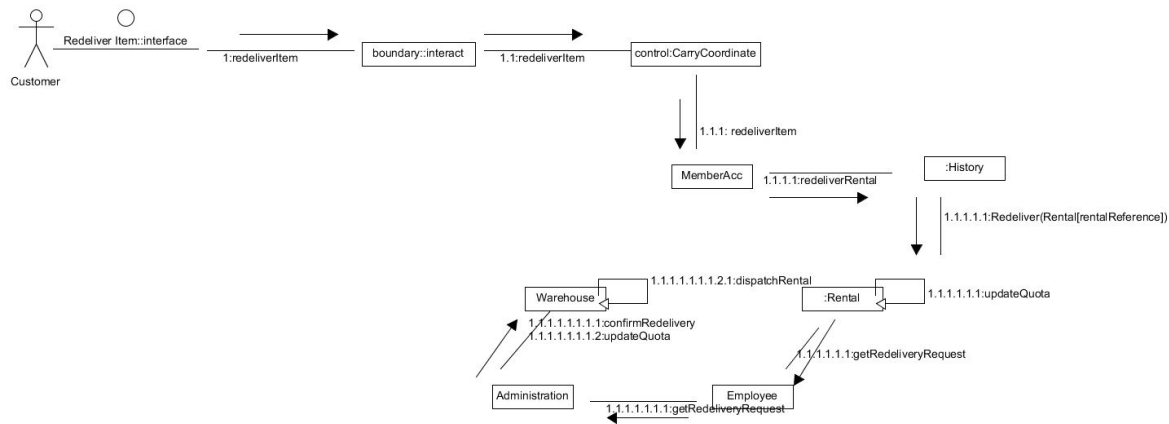


Process returned Item/s

processReturn() from Employee which Warehouse inherits for the purpose of updateStock() and checkItemIntegrity(), and Administration, for the purpose of updateCatalogue(), which cascades through operation updateMedia() to mark item *available* again. Administration would also updateQuota(), in MemberAcc

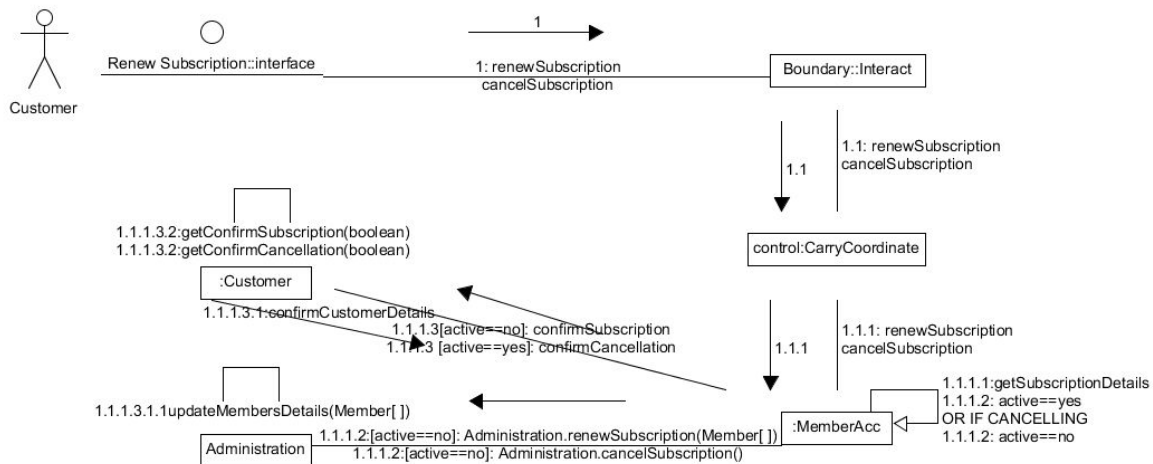


Redeliver Item redeliverRental() from History to Rental, redeliverRental to Employee getRedeliveryRequest from which Administration would check its attributes *members* in conjunction with *redeliveryRequests* and accordingly confirmRedelivery() upon which Warehouse would dispatchRental() and Administration would updateQuota().



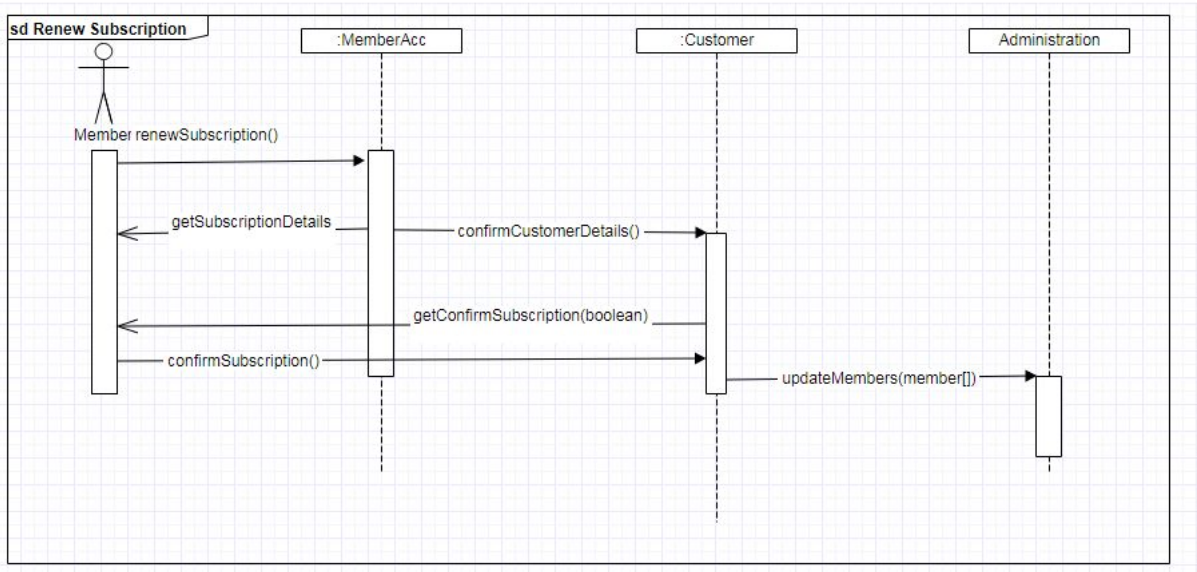
Renew Subscription

renewSubscription() or cancelSubscription() from MemberAcc, depending whether member requests for renewal or cancellation. With renewSubscription() in MemberAcc client would provide details of subscription (if they make any changes). Either way, attributes in Customer such as payment details and contact details are checked to assure they're up to date, via confirmCustomerDetails(). After all the relevant attributes in classes, MemberAcc (eg *dateOpened* or *dateClosed*), Customer are checked/updated and the customer confirms they want to renew, through operation confirmCustomerDetails(), renewal (or cancellation) is successful and the data Administration holds about the clients are also updated (via operation updateMembersDetails(Member[])).



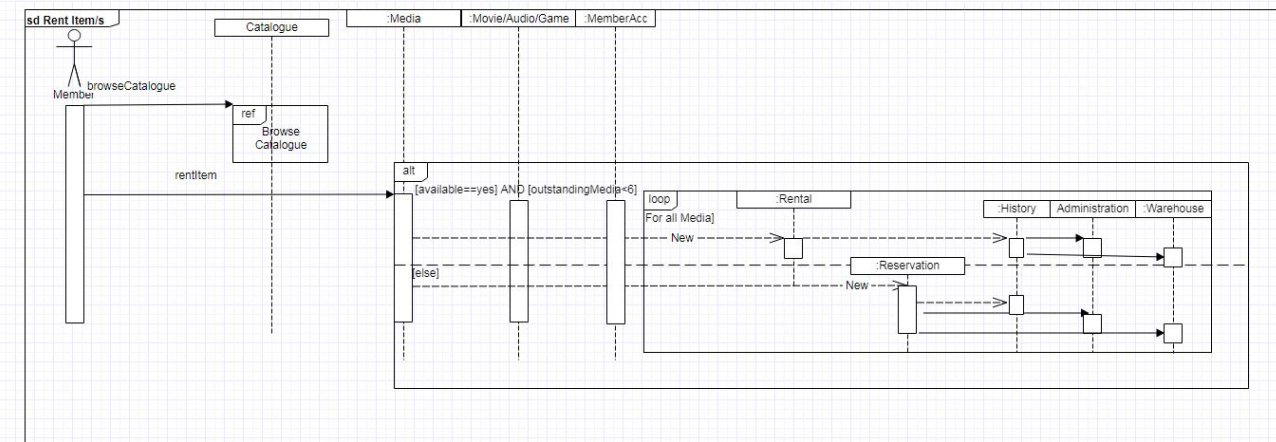
Sequence Diagrams

Renew Subscription

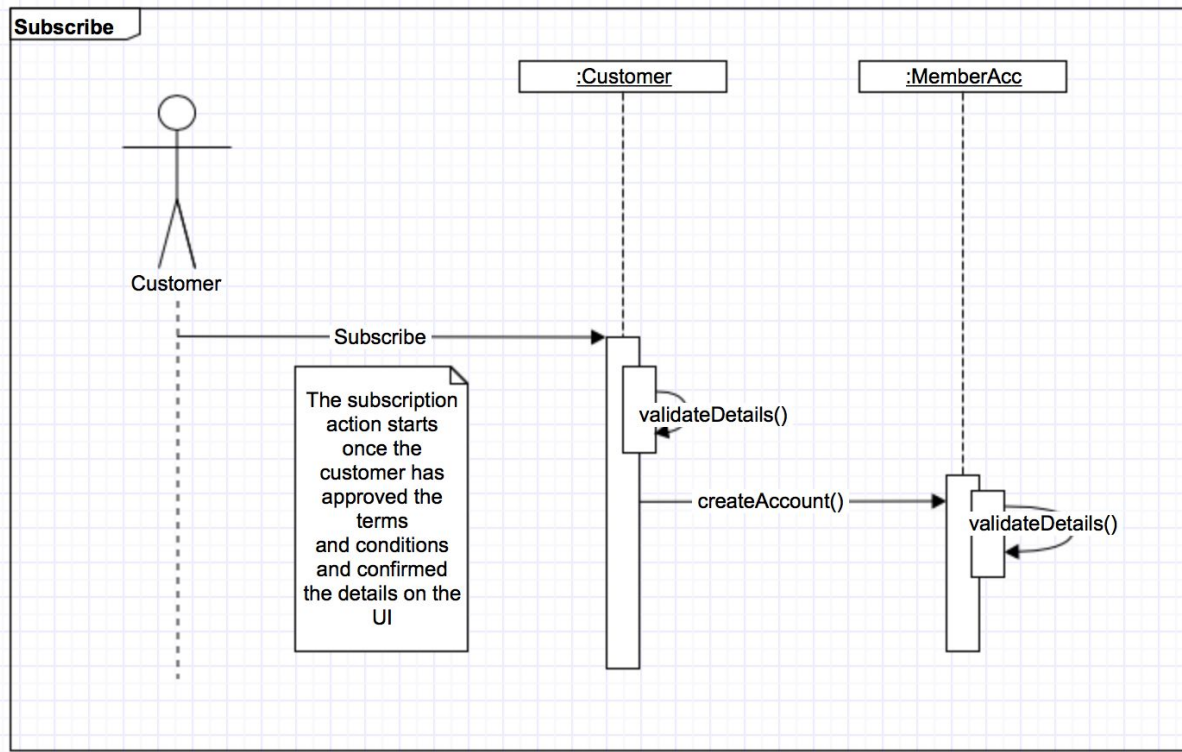


Rent items

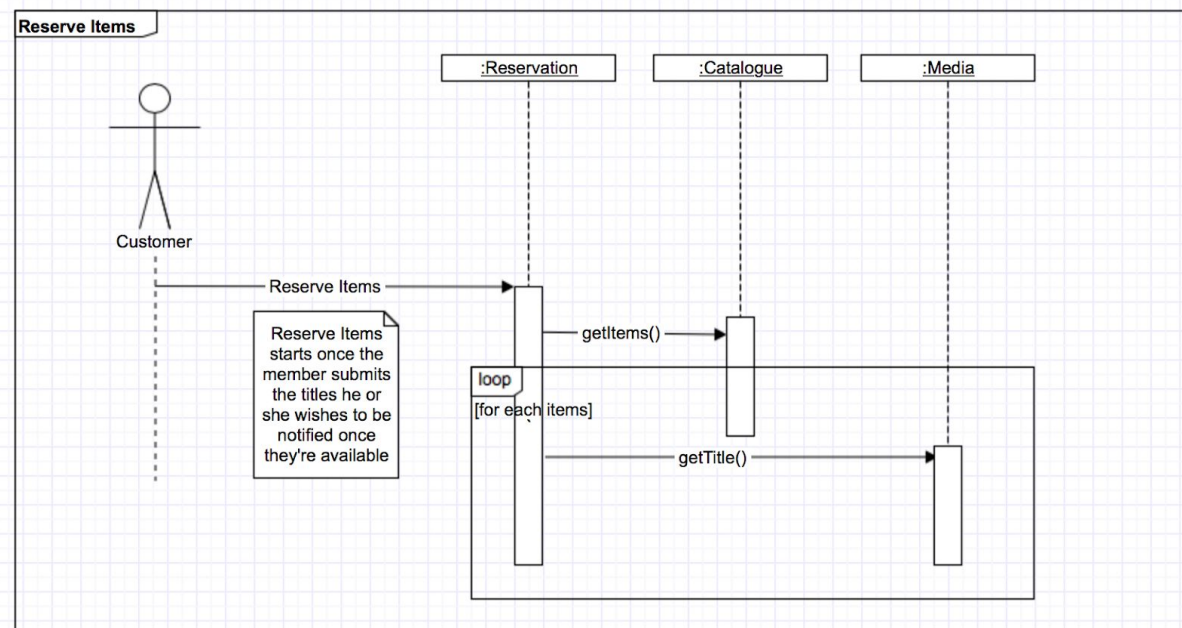
Gliffy / Rent Item, v5



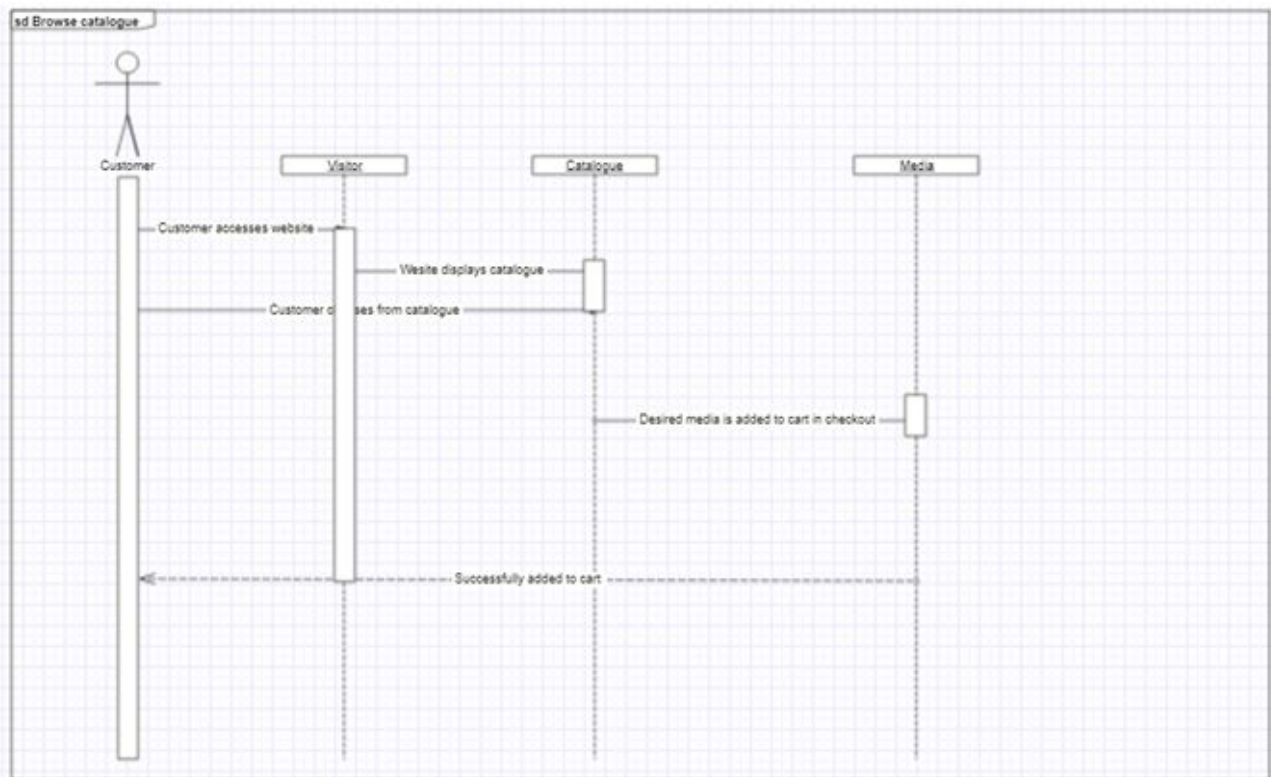
Subscribe



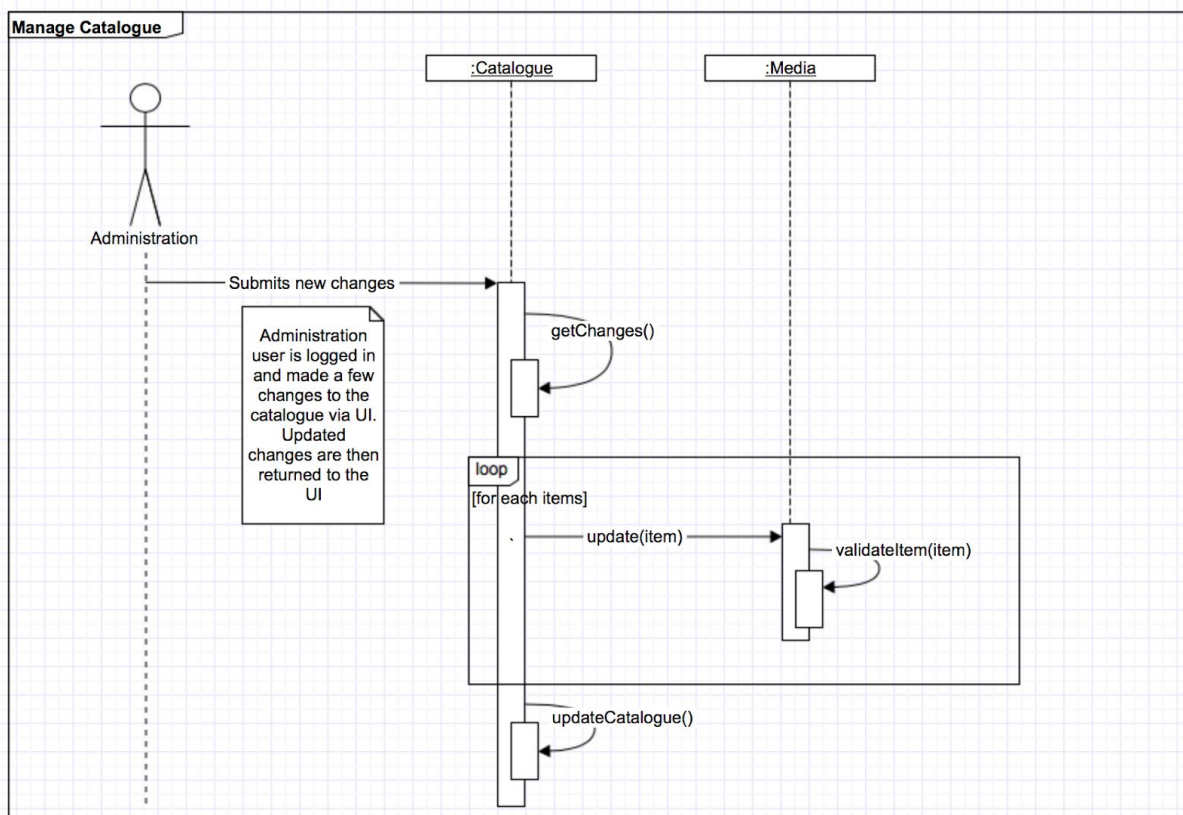
Reserve Items



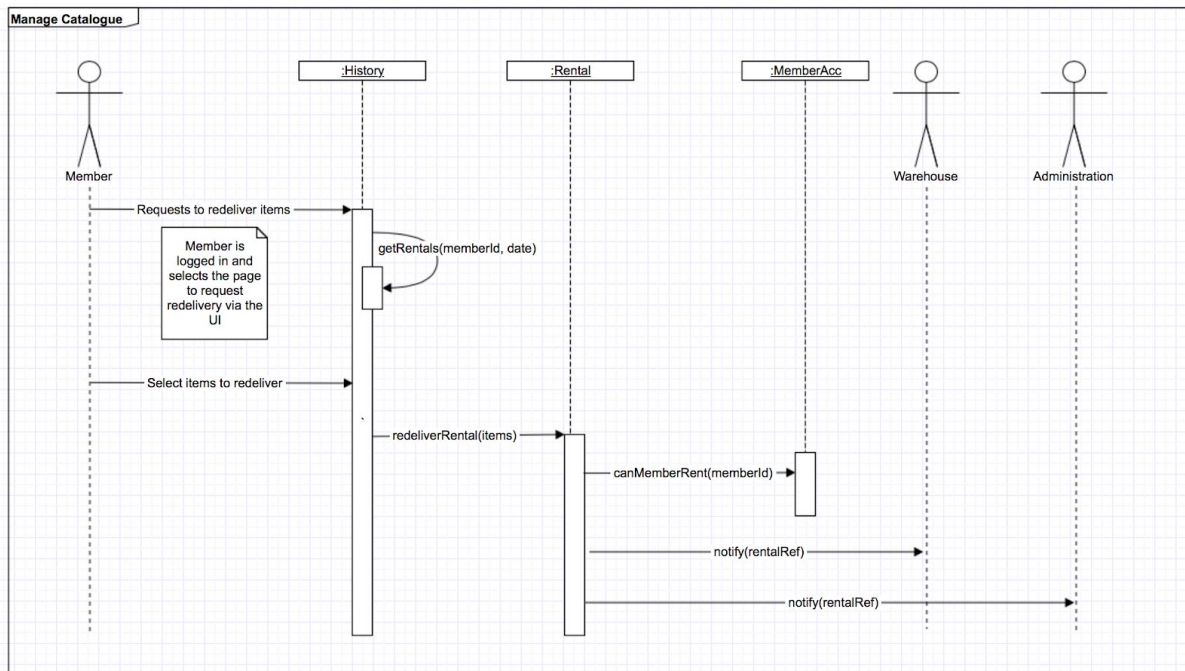
Browse Catalogue



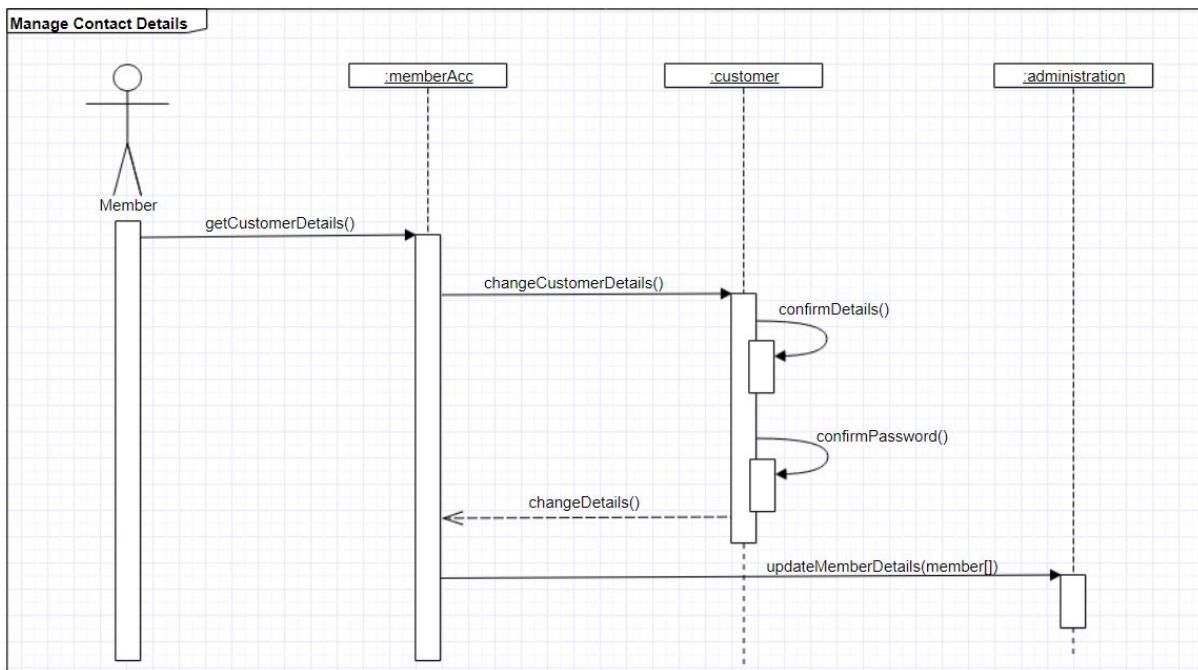
Manage Catalogue



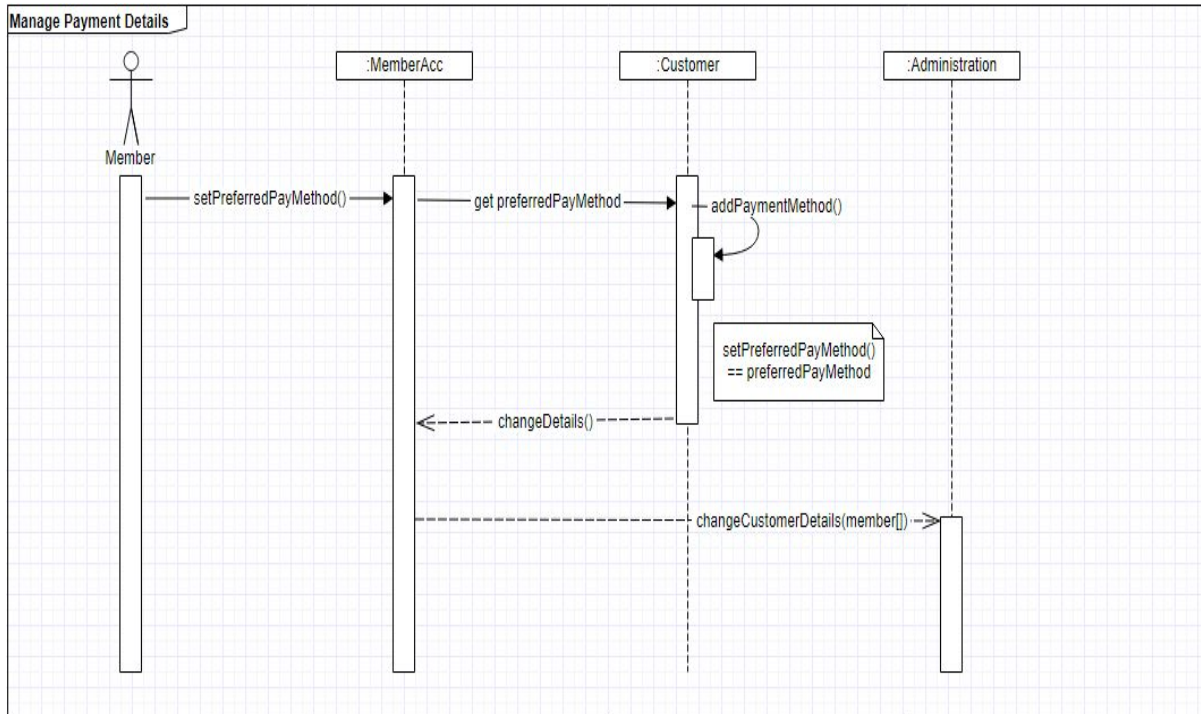
Redeliver Rental



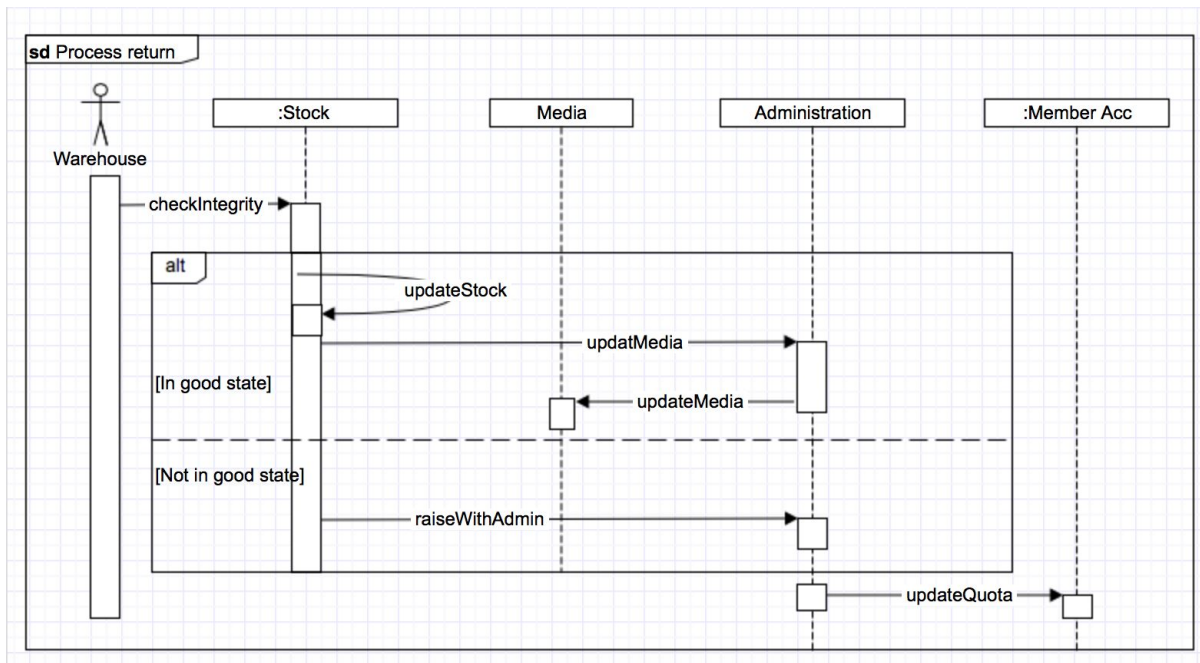
Manage Contact Details



Manage Payment Details



Process returned item/s



CRC Cards

Class name: Visitor	
Responsibilities	Collaborations
Browse the Catalogue	Customer provides contact and payment details
Create subscription	Catalogue provides item summary
	MemberAcc provides member information

Class name: MemberAcc	
Responsibilities	Collaborations
Provides Member information	Customer provides contact and payment details
Rent a Media	Catalogue provides item summary
Reserve a Media	Rental provides rental summary
	Reservation provides Reservation summary

Class name: Customer	
Responsibilities:	Collaborations
Provides contact and payment details Cancel subscription Change subscription Change contact Cancel Reservation	MemberAccount provides Member information Reservation provides Member information

Class name: Rental	
Responsibilities	Collaborations
Provides rental summary Create Rental Request dispatch Mark itemOf/Rental returned	MemberAcc provides rental request/confirmation Warehouse provides return processed confirmation

Class name: Reservation	
Responsibilities	Collaborations
Provides Reservation summary Make a reservation Cancel a reservation	Media provides media details MemberAcc provides member details

Class name: Administration	
Responsibilities	Collaborations
Update Quota Cancel reservation Approve membership Approve payment Update Catalogue	Customer provides customer details MemberAcc provides member details Reservation provides reservation details Rental provides rental summary Catalogue provides catalogue summary

Class name: Media	
Responsibilities	Collaborations
Provide media details Mark media as damaged Mark media as hired/reserved Construct new Media	Rental provides rental summary Reservation provides rental summary MemberUI provides instance details

Class name: Warehouse	
Responsibilities	Collaborations
Dispatch Rental Process return (provide confirmation) Freeze media (if reservation is placed)	Rental provides rental summary and dispatch request Customer provides contact details

Class name: Employee	
Responsibilities	Collaborations
Redeliver item/s Provides employee detail	Rental provides rental summary MemberAcc provide Redelivery request

Class name: Catalogue	
Responsibilities	Collaborations
Provides item summary Add entry to catalogue Add description Delete entry Hide entry (when it's temporarily unavailable - eg hired)	Media provides media details Rental provides rental details (is it hired?) Reservation provides reservation details (is it reserved?)

Class name: Movie	
Responsibilities	Collaborations
Construct new instance of Movie category Show summary of instance created	Media provides details for instance

Class name: Game	
Responsibilities	Collaborations
Construct new instance of Game category Show summary of instance created	Media provides details for instance

Class name: Audio	
Responsibilities	Collaborations
Construct new instance of Audio category Show summary of instance created	Media provides details for instance

Conclusion

This requirements report has been created to clarify the purpose of our proposed system, which is an Online DVD rental company. We have done this by using UML which is a modelling language. During the analysis stage, a use case diagram was used, in order to show the interaction of people with the system. Activity diagrams were used to model the system functions. Class diagrams were used to show the structure of the system by its classes and attributes. To show the interaction of different objects and how the objects collaborate both sequence and communication diagrams were used.