IFSC 3360: System Analysis and Design

Final Project Report

Amazon.com

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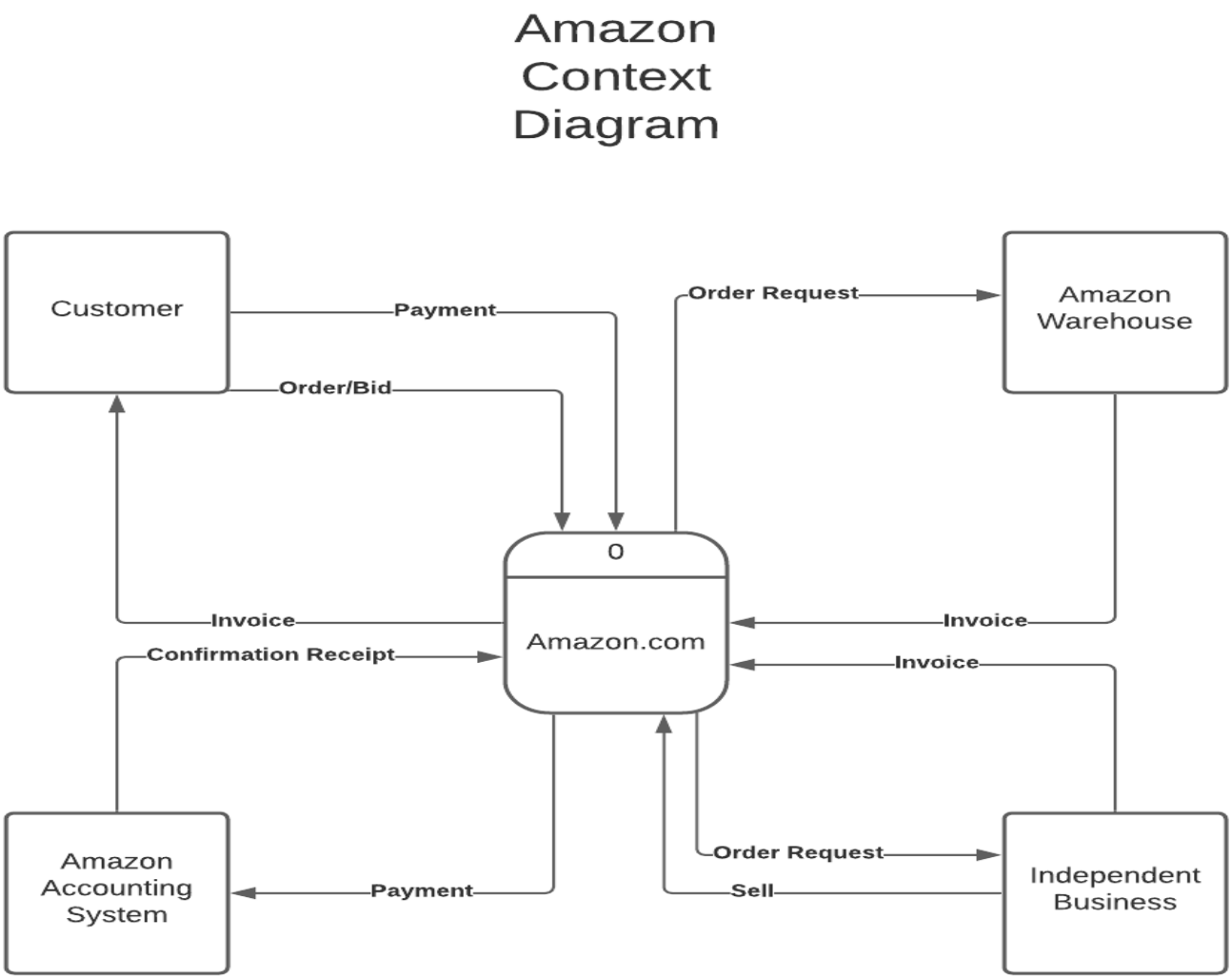
1. Introduction

- Define system’s objectives.
- Does it improve an existing system or is it a brand-new system?
- Justify why the system is needed.

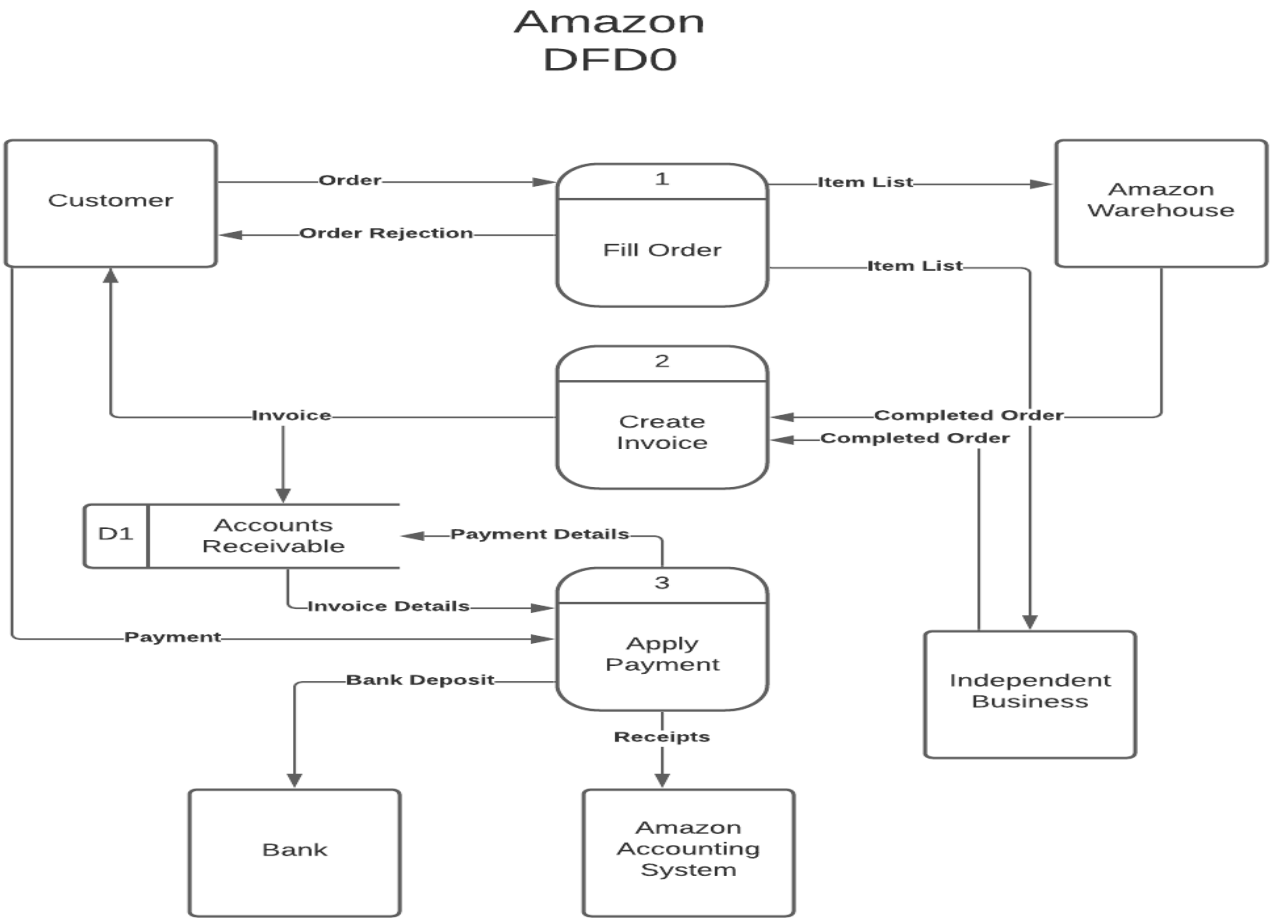
Amazon is the world's largest online retailer. Amazon has millions of product listings some of which include various forms of media, apparel, electronics, groceries, accessories, and so on. Amazon is a one stop shop for some of the best prices the web has to offer. Currently Amazon is only set up to allow their users to purchase products for the price set by the publisher of the item listing. A useful system that could be implemented into the current Amazon system is a bidding feature. Our system’s objective that we added is the ability for customers to bid on item listings on amazon's website. This would mean any business looking to create a product listing on Amazon would have the option to get a feel for what some customers are willing to pay for certain products. This would be an improvement to amazon’s already existing system that only allows customers to buy items at a price set by the business selling it. Some customers may not be willing to pay what the publisher has listed the item for but may not be too far from that price. What this means is businesses that create listings may be able to sell items faster or in greater volumes to the consumers who are more likely to bid than accept a set price. The system that we added is needed because it allows the customer more flexibility in how they purchase items on the website. Whether they just directly buy the item for the price the business puts it up for or being able to bid on the item to determine the price they would like to buy the item at.

2. System Requirements Model

Provide snapshots of DFD diagrams with brief high-level descriptions.

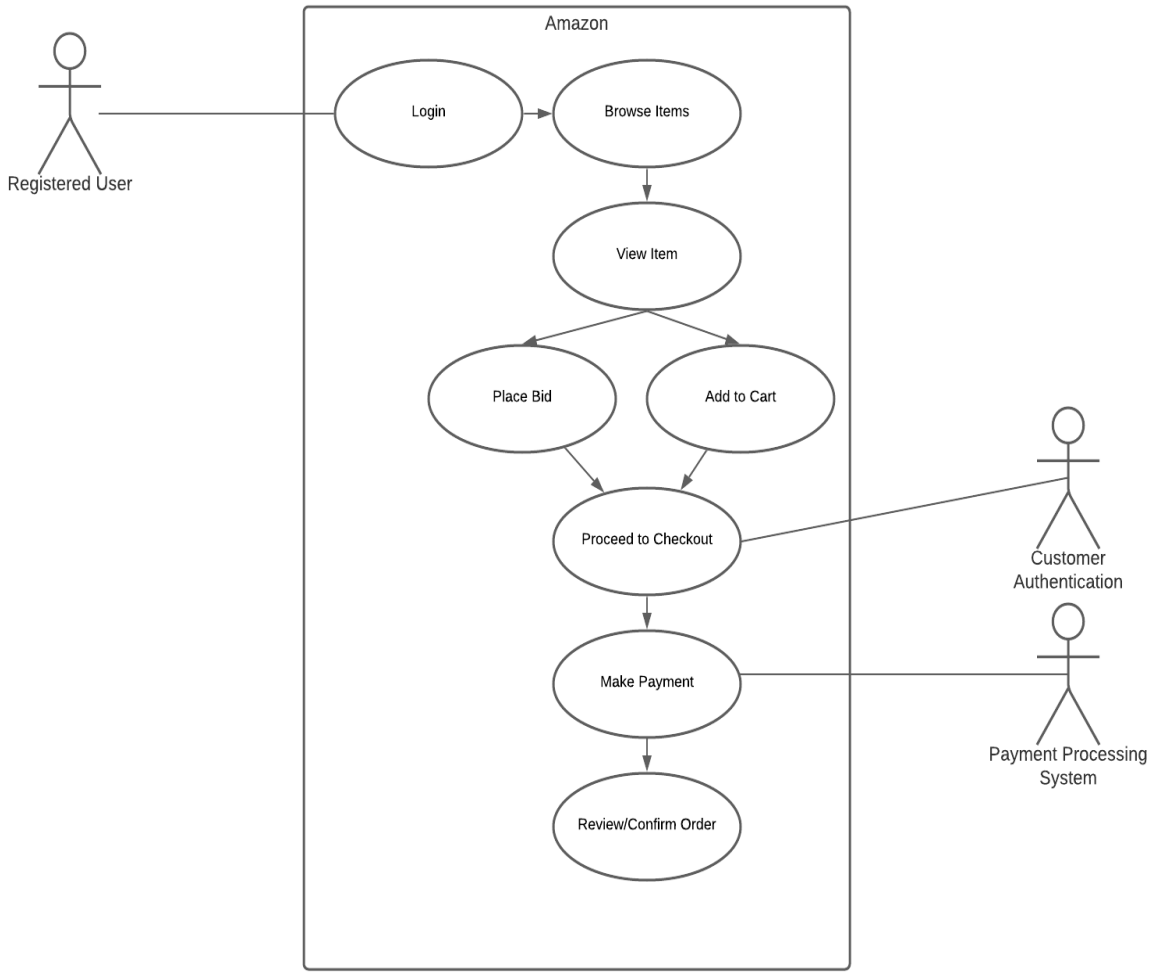


The Amazon Context Diagram shows the main amazon system in the middle and the 4 other systems that connect to it, these being Customer, Amazon Warehouse, Independent Business, and the Amazon Accounting System. It also shows how they connect like the customer ordering items, then paying amazon, and getting an invoice for their order.



The amazon DFD0 shows an expanded view of the Amazon system. Which splits it further down into 3 extra systems, these being fill order, create invoice, and apply payment. It keeps the original 4 connecting systems of customer, warehouse, independent business, and accounting system. Additionally it adds the banking system which connects to the new apply payment system within Amazon.

Provide a snapshot of the UML use case diagram of the entire system and a brief high-level description. Provide main/success scenarios, alternate scenarios, pre-conditions, and post-conditions for all the use cases.



The Amazon UML use case diagram consists of 3 actors and 8 use cases. The first actor is the registered user who begins by logging into the website and proceeds to browse items. The user then selects an item and chooses to place a bid on it or add the item to their cart. After that, the user proceeds to checkout where the second actor authenticates the user. After customer authentication has been completed the user proceeds to pay for their order where the third actor processes their payment. Finally, the user is able to review/confirm their order.

The main success scenarios for the Login use case are the user being able to access the system, the user providing their account information, the user information being successfully captured by the system, and the user proceeding to account verification. Alternate scenarios for the Login use case are the system being unavailable, the user providing an invalid email, and the user providing an invalid password. The precondition for the Login use case is the website being functional and the postcondition is the user successfully logging in.

The main success scenario for the Browse Items use case is the items being displayed. Alternate scenarios are the system being unavailable and the system not finding any items with matching descriptions. The precondition for this use case is a successful user login and the postcondition is the user being allowed to browse items.

The main success scenario for the View Item use case is the user being able to view the item. Alternate scenarios are the system being unavailable and the item no longer existing. The precondition for this use case is the user having browsed items and the postcondition is the user successfully viewing an item.

The main success scenario for the Place Bid use case is a bid being successfully placed. Alternate scenarios include the system being unavailable, being outbid by another user, not satisfying the minimum bid amount, and the product listing being cancelled. The precondition for this use case is the item being successfully viewed and the postcondition is the bid being successfully placed.

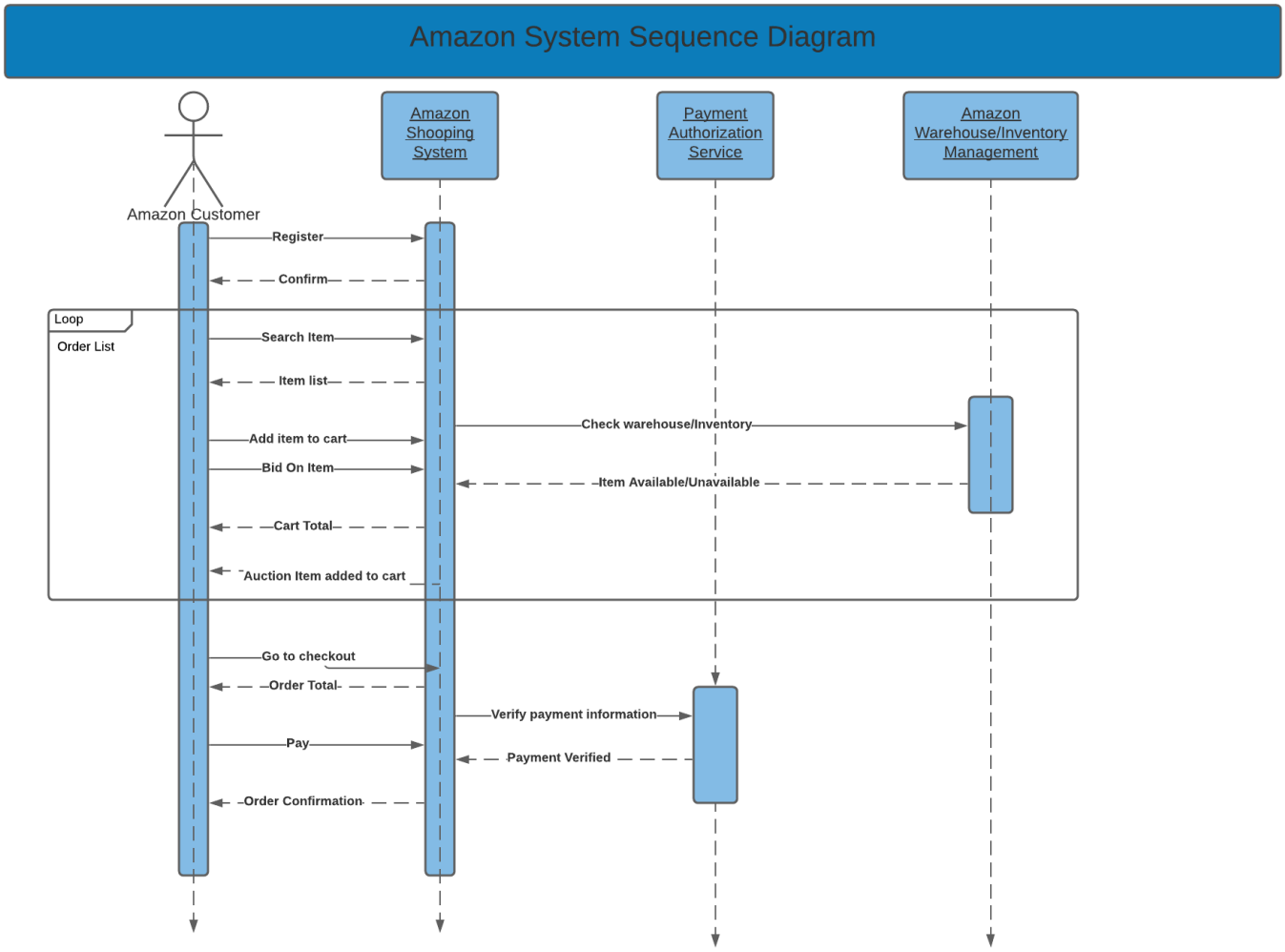
The main success scenario for the Add to Cart use case is the user being able to add the item to their cart. Alternate scenarios include the system being unavailable and the item being out of stock. The precondition for this use case is the user having successfully viewed the item and the postcondition is the user being able to add the item to their cart.

The main success scenario for the Proceed to Checkout use case is the checkout screen loading. Alternate scenarios include the system being unavailable, an authentication error, the item being out of stock, and the listing being cancelled. The precondition for this use case is the item being successfully added to the cart and the postcondition is the user successfully accessing the checkout screen.

The main success scenario for the Make Payment use case is the user paying for the items in their shopping cart. Alternate scenarios include the system being unavailable, payment information being incorrect, and a payment status error. The precondition for this use case is the user successfully proceeding to checkout and the postcondition is the user successfully paying for the items in their cart.

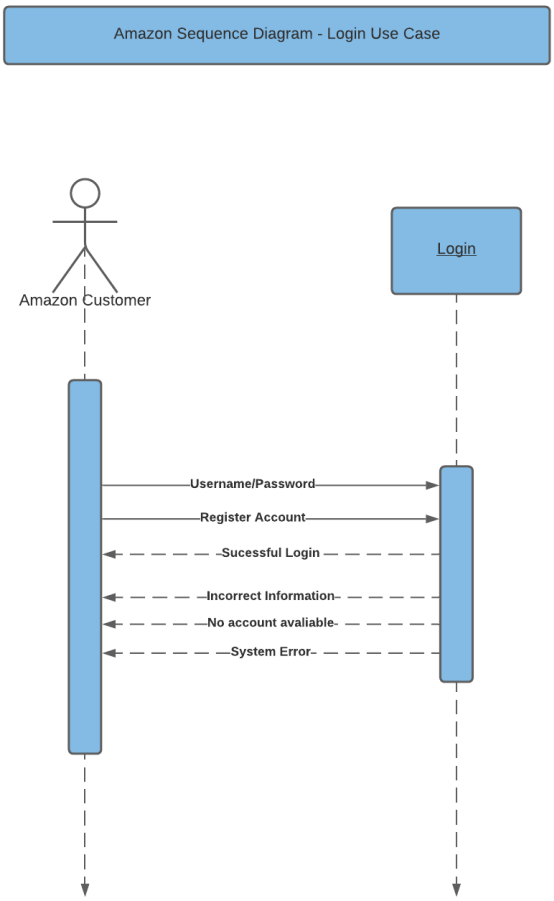
The main success scenarios for the Review/Confirm Order use case are the user being able to view their order and being able to confirm the successful placement of their order. Alternate scenarios include the system being unavailable and the order being unable to be fulfilled. The precondition for this use case is the user having input their payment information and the postconditions are the user being able to review their order and confirm their order has been placed.

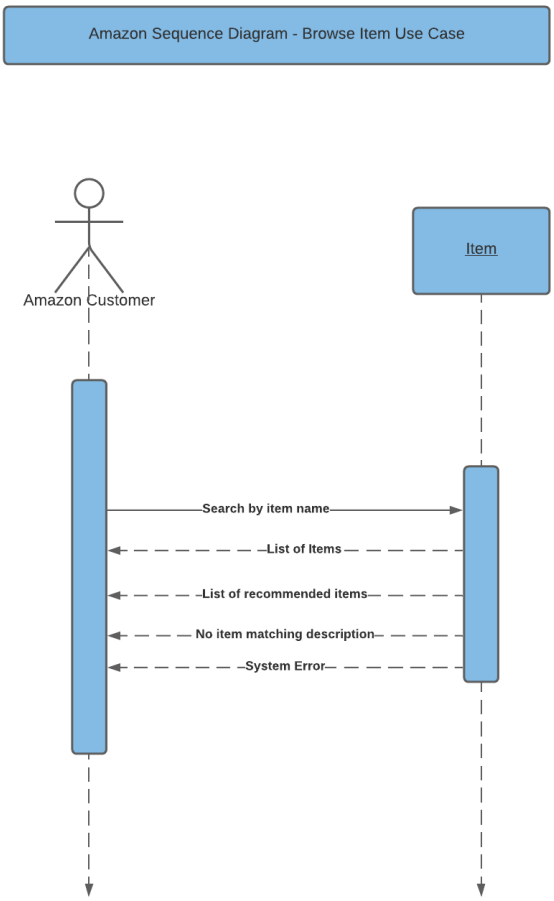
Provide snapshot of the system sequence diagram (SSD) of the entire system and a brief high-level description.



The Amazon System Sequence Diagram shows the 4 main systems that are a part of the whole, these being the customer, amazon system itself, the payment system, and the warehouse management system. It shows all of the actions that the customer can take within the shopping system itself like searching items, adding to cart, paying the order, etc. It also shows these connect to the payment system through verifying payment information and the warehouse system by checking for item avaliability.

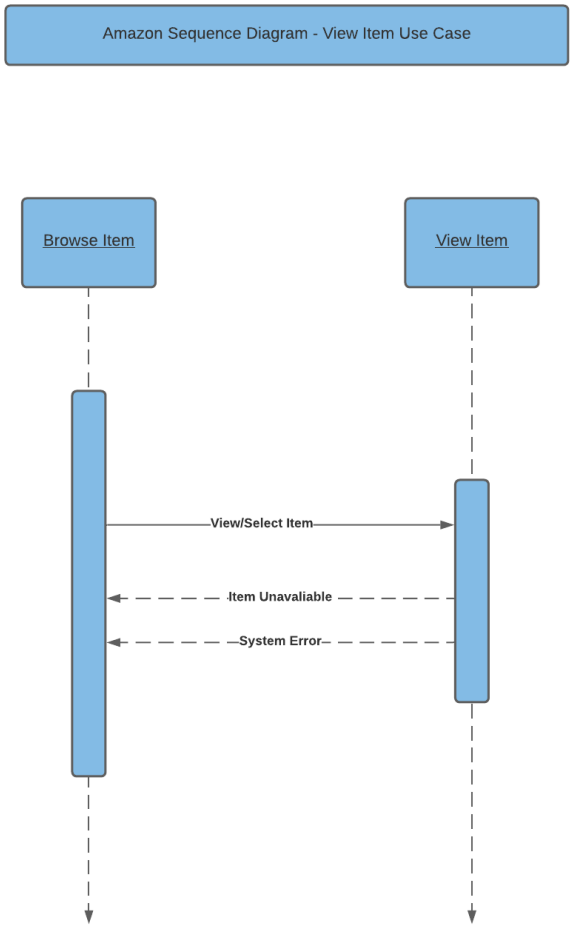
Provide snapshots of all sequence diagrams (SD) and brief high-level descriptions explaining how it realizes the use case scenario for which the particular sequence diagram was designed.

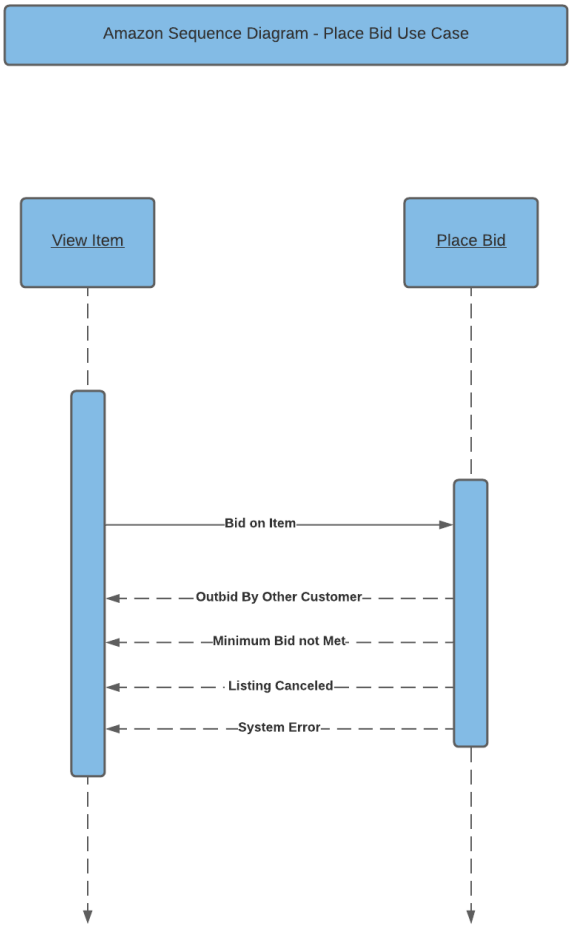




The Sequence Diagram - Login shows the use case for when the user tries to login and all the possible solutions to that. Whether it being them creating a new accounting, logging in successfully, not entering the correct information, or the system encountered an error.

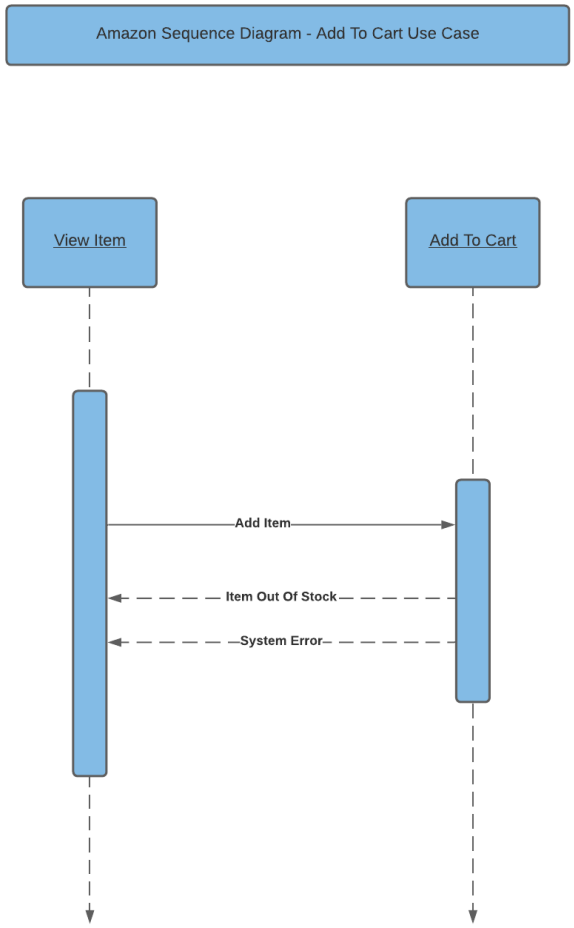
The Sequence Diagram - Browse Item shows the use case for after logging in when the user can search for items, get back a list of recommended items, or be shown that no items match their description, or the system encountered an error.

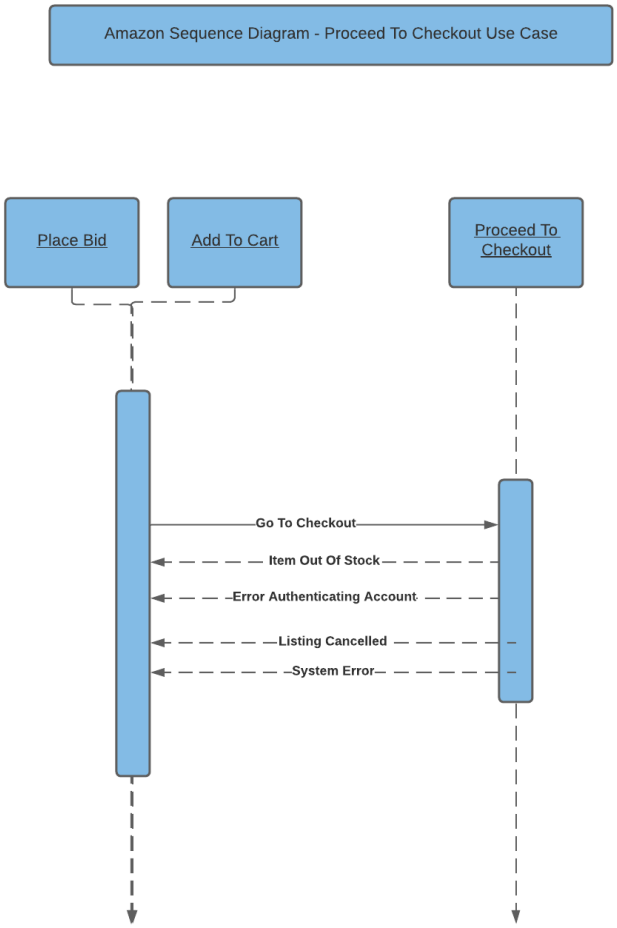




The Sequence Diagram - View item shows that after the user browses the item they can select/view it, or they get shown that the item is unavailable and sent back to browsing, or encounter a system error.

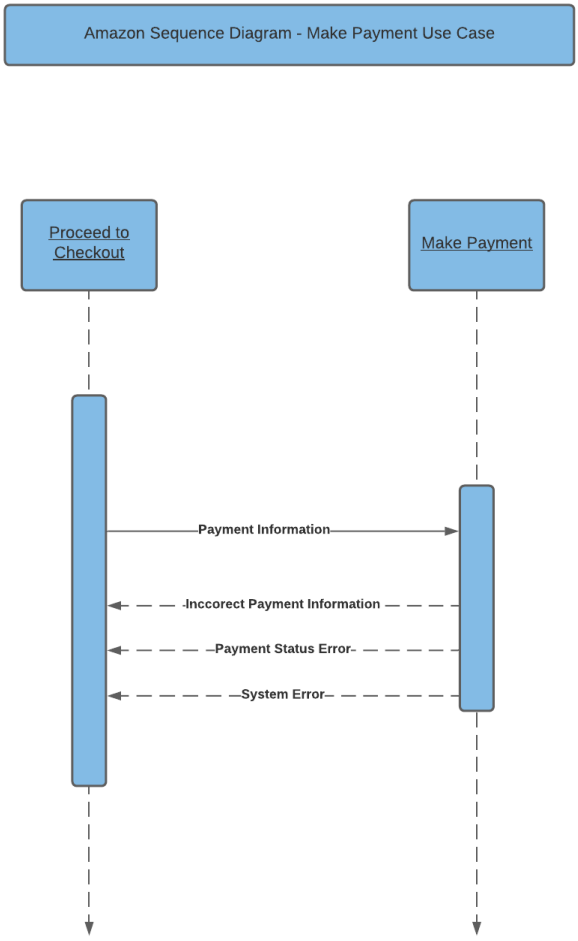
The Sequence Diagram - Place bid shows that after they view an item that has bidding they can then bid on the item, or be shown they did not meet the bid requirement, they were out bid or the listing was canceled, or encountered a system error.

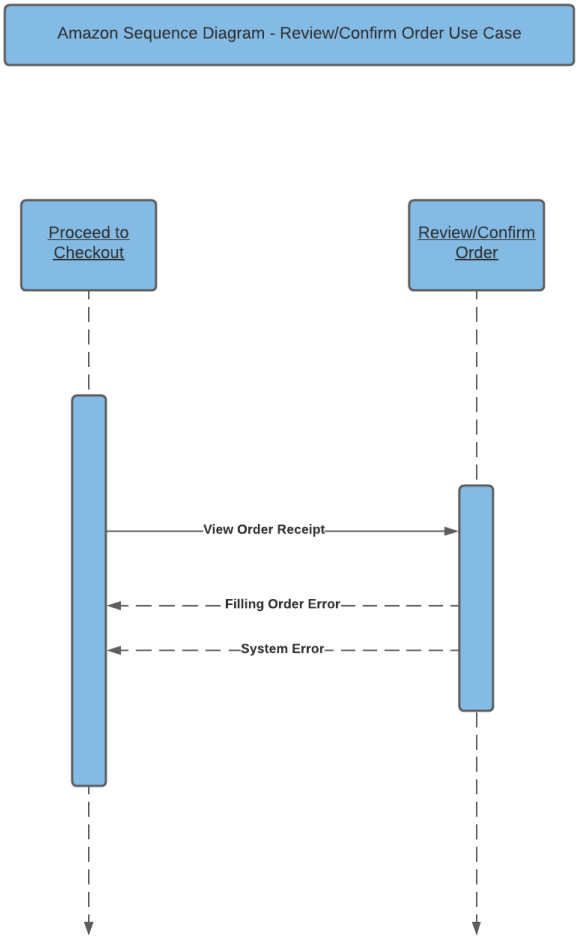




The Sequence Diagram - Add To Cart is the other option the user can get when viewing an item that doesn't have bidding, where they can then add the item to the cart or be sent back to viewing if its out of stock, or they encounter a system error.

The Sequence Diagram - Proceed To Checkout shows that after they have passed the place bid/ add to cart cases they can go to checkout, or be sent back because of an out of stock item, error authenticating account, a bid listing was canceled, or encountered a system error.

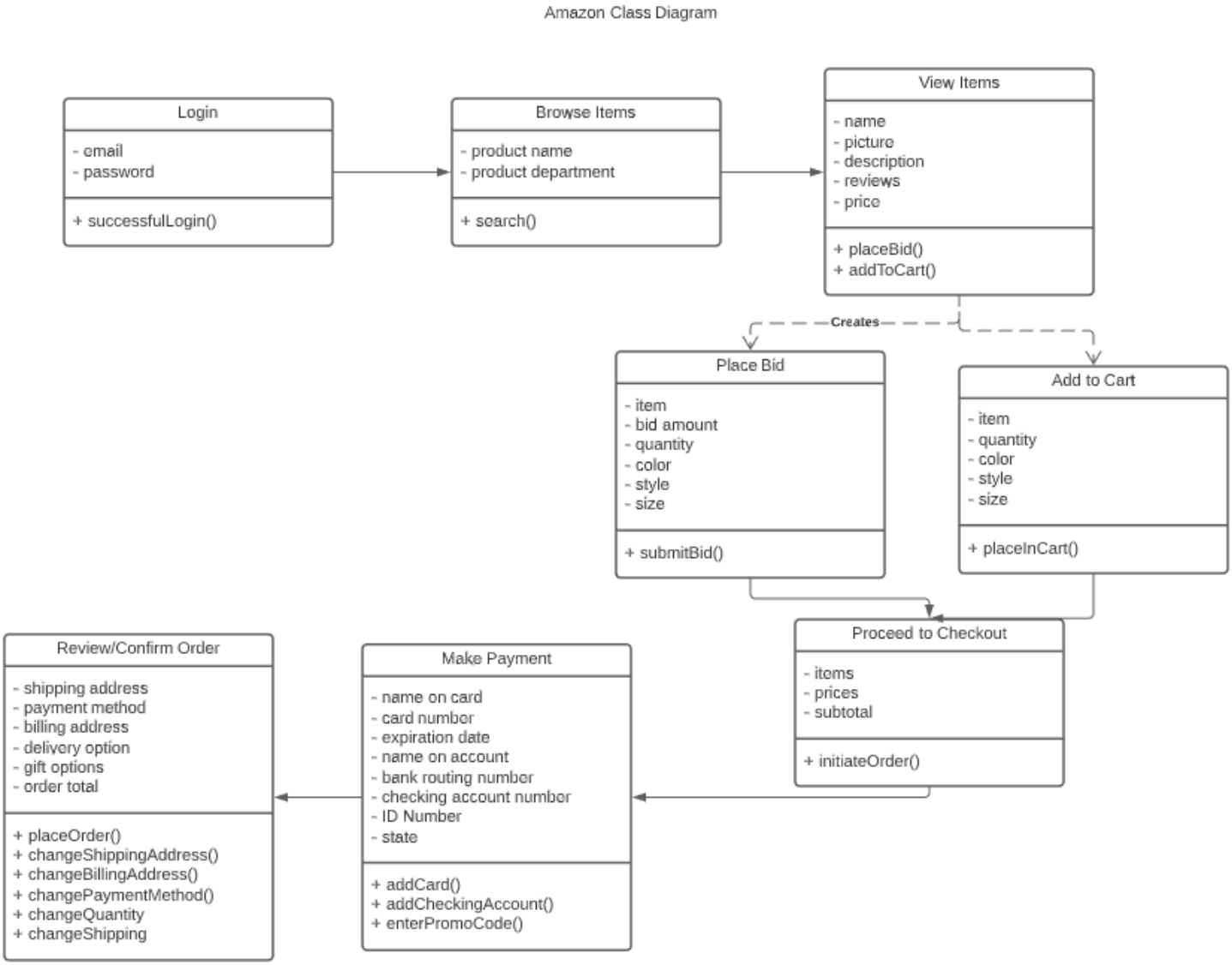




The Sequence Diagram - Make Payment show the use case after checking out where they input their payment information, or their payment information is incorrect, or they have a payment error like lacking funds, or encountering a system error.

The Sequence Diagram - Review/Confirm order shows the use case after they have checked out where they can view the order receipt to make sure the order went through and to track it, or if there was a problem filling the order and it was canceled, or they encountered a system error.

Provide a snapshot of the class diagram for the entire system with a high-level description. Also explain the rationale of the associations, dependencies, and inheritance relationships using an example.



The above class diagram consists of 8 classes, one for each use case in the system. The browse items class is associated with the login class because the user must successfully login to begin browsing items. The view items class is associated with the browse items class because it's the specific item from the browsing stage that's been chosen to be viewed. The place bid and add to cart classes are both dependent on the view items class because both processes are begun by the user during the view item stage. The bid itself is entirely created by the user following the view item stage. Once a bid has been placed or the item has been added to the cart the user must

proceed to checkout for the items associated with the previous classes. By association the user must then pay for their items and finally review/confirm the order for those items.

3. Lessons Learned

- What would you do differently, if you had another shot at the system analysis?
  - We could do additional research on the system that we are using for our project. So that we could get more in depth into the system and find out all the parts of it instead of just the major systems.
  - This would allow us to have more use cases in our project since we would look at more of the minor parts of the system which would allow us to have additional use cases than the ones that we already have.

4. Team Description

- Describe the roles of each team member (who worked on what part?)
  - LIam Daniell did DFD Context and DFD0, interaction diagrams, half of the fully dressed use cases, and their corresponding parts of the project report
  - Nathan Hartzell did Use case diagram, class diagrams, half of the fully dressed use cases, and their corresponding parts of the project report