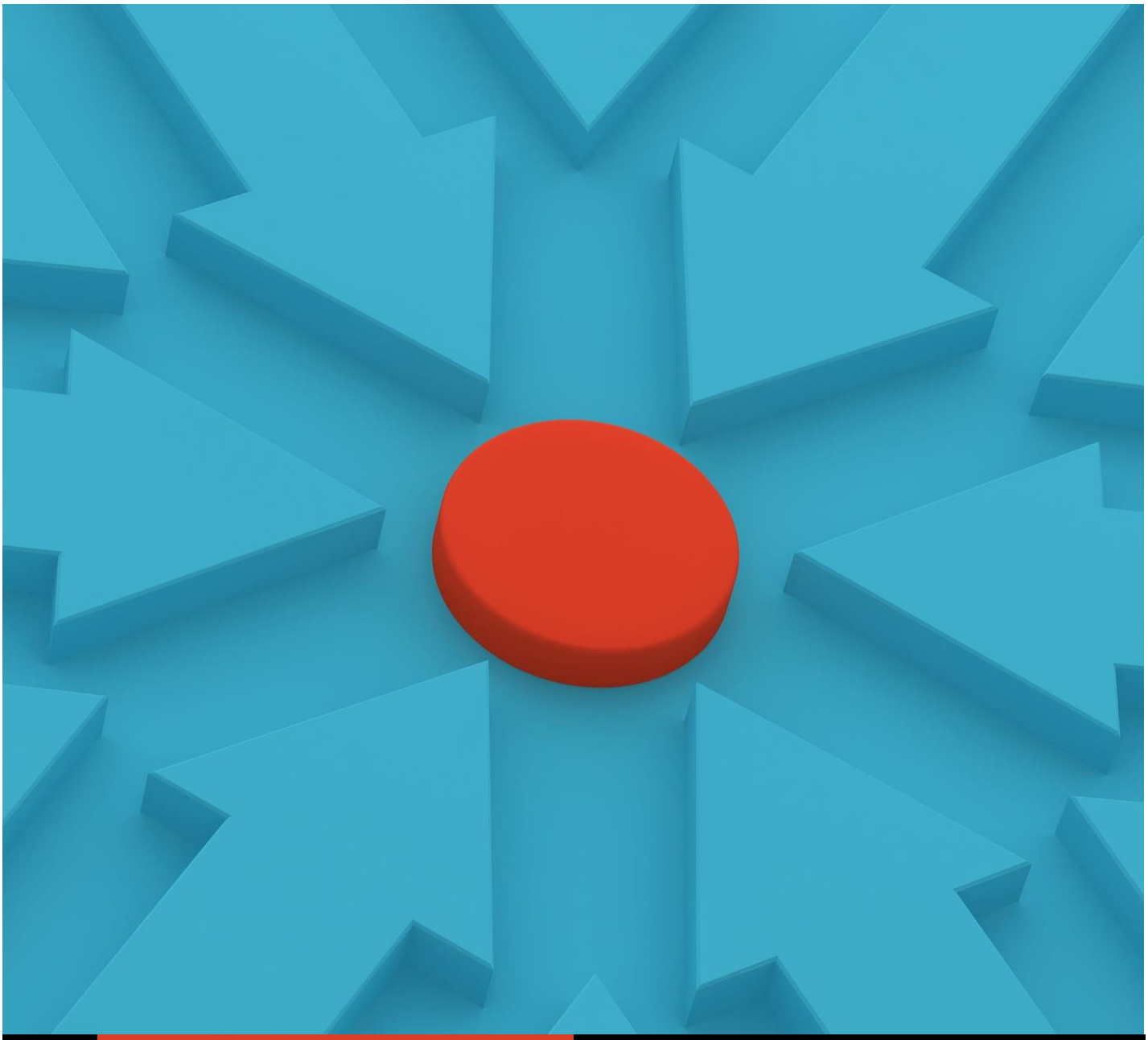

Revised Use Case, Sequence Diagram, Class Model, and Class Documentation and their Relationships for the BestPurchase Application.

Abstract: What is the revised use case for the BestPurchase application? What does the sequence diagram look like for this use case? What does the class model diagram look like? What are the classes, their descriptions, and how they relate to one another?

Harrison Huston

Part 2, February 13, 2023

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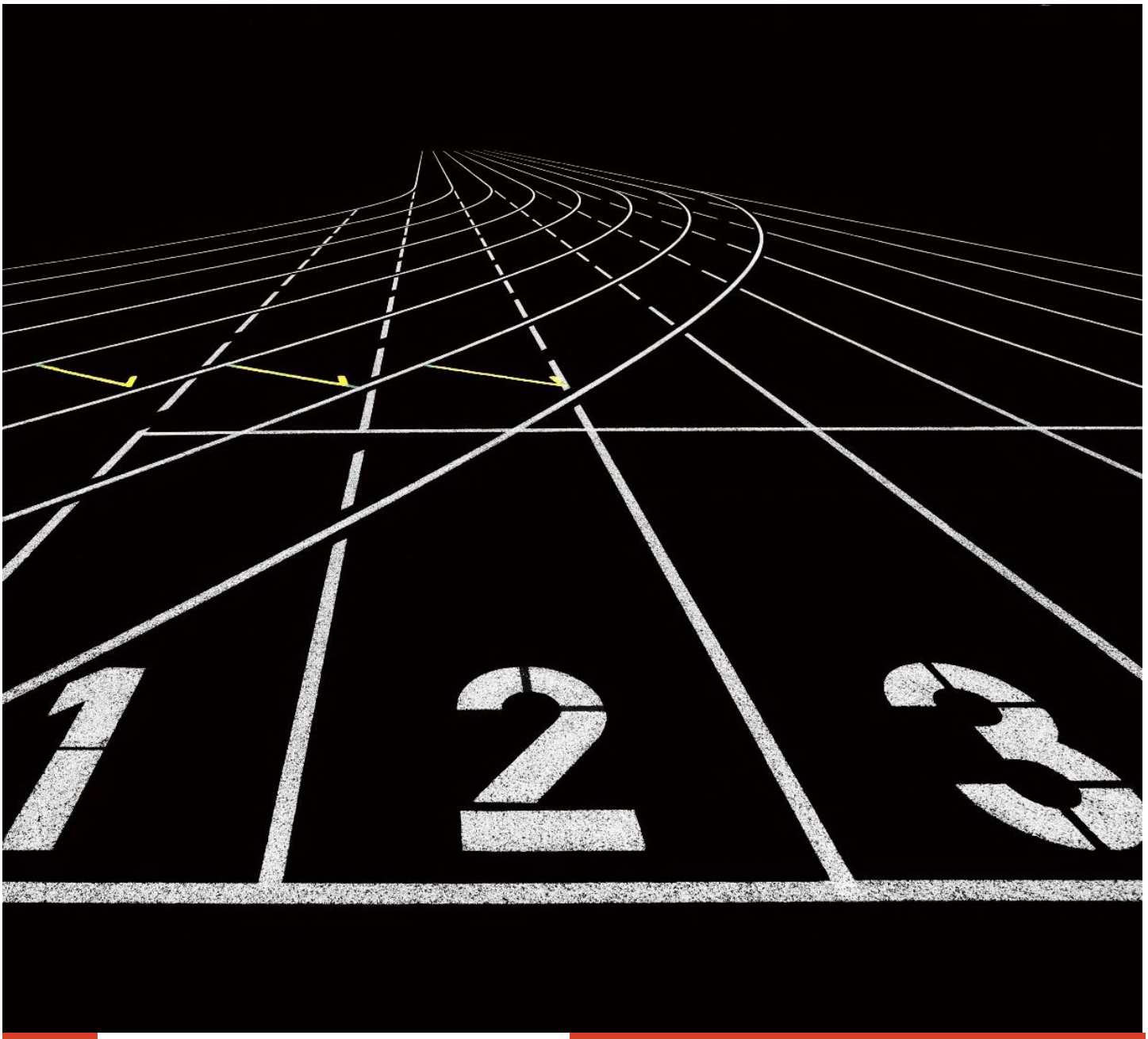
FIGURES



INTRODUCTION

Part 2 focuses on the BestPurchase application and designing with the Unified Modeling Language (UML). A use case is selected and revised. A sequence diagram and a class model diagram are created. Three business classes are selected, as well as one non-business class. These classes are described in relation to the design and their relationships to other classes.

2.1 SELECTED USE CASE, REVISED

Revision Notes:

The below use case has been revised to accommodate functional requirement 6, which includes the Account Holder having the ability to view a pair of shoes from each sub list and display each pair of shoes description, type, available sizes, available colors, retailer, and price for each retailer. Additionally, the steps to return to the shoes list page have been added following viewing the last sub list (“based off similar customers”). The step numbers have been changed and so have the alternate course numbers. Also, alternate courses have been added to accommodate for cases in which the Actor does not have the ability to select a pair of shoes to view, due to no shoes being displayed on each sub list. Lastly, the use case has been changed to accommodate future functionality of the BestPurchase application. The step has been added to begin on the items list page and navigate to the shoes page. Although BestPurchase is currently only designed to sell shoes, this change will help accommodate if they expand to sell other items in the future. This aspect was also accommodated for in the addition of Alt Step #2.

Use case Name	Navigating Shoe Inventory	
Actor:	Account Holder	
Description:	This use case describes the event of an Account Holder with a unique profile on the BestPurchase application navigating the different lists of shoes and viewing a pair of shoes from each list. The use case will include the steps for navigating an Account Holder’s shoe lists based off their unique profile and viewing a pair of shoes from each of these lists. (This use case pertains to Functional Requirement 5, including a through e, and Functional Requirement 6, including a through f). The use case will end once the account holder has viewed each shoe list and a pair of shoes from each list.	
Pre-condition:	User has created an account and unique profile in the BestPurchase application, and the system is currently displaying the Items List Page.	
Step #	**Actor**	**System**
1		System displays the items list page which displays item categories on the BestPurchase application.

2	Account Holder selects shoes.	System displays the shoes page and the following subcategories: all shoes, newly released shoes, recently added shoes, shoes based off past purchases, shoes based off similar customers
3	Account Holder selects all shoes subcategory.	System displays a list of all the shoes that match the Account Holder's unique profile.
4	Account Holder selects a pair of shoes from the list "all shoes".	System displays the pair of shoes and their description, type, available sizes, available colors, retailer, and price for each retailer.
5	Account Holder closes the shoe attribute window.	System displays a list of all of the shoes that match the Account Holder's unique profile.
6	Account Holder selects shoe lists page.	System displays the shoe lists page.
7	Account Holder selects newly released shoes subcategory.	System displays a list of all the shoes that match the Account Holder's unique profile that are newly released.
8	Account Holder selects a pair of shoes from the list "newly released shoes".	System displays the pair of shoes and their description, type, available sizes, available colors, retailer, and price for each retailer.
9	Account Holder closes the shoe attribute window.	System displays a list of all the shoes that match the Account Holder's unique profile that are newly released.
10	Account Holder selects shoe lists page.	System displays the shoe lists page.
11	Account Holder selects recently added shoes subcategory.	System displays a list of all of the shoes that match the Account Holder's unique profile that are recently added to their all shoes category.
12	Account Holder selects a pair of shoes from the list "recently added shoes".	System displays the pair of shoes and their description, type, available sizes, available colors, retailer, and price for each retailer.
13	Account Holder closes the shoe attribute window.	System displays a list of all of the shoes that match the Account Holder's unique profile that are recently added to their all shoes category.

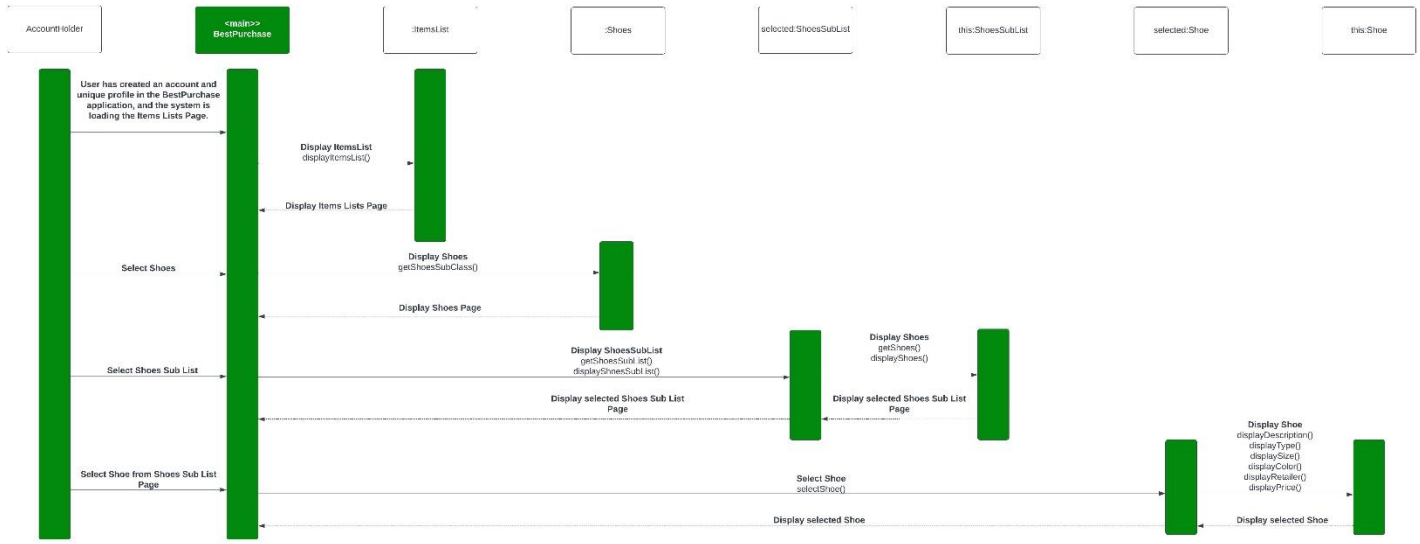
14	Account Holder selects shoe lists page.	System displays the shoe lists page.
15	Account Holder selects shoes based off past purchases subcategory.	System displays a list of all the shoes that are similar to the Account Holder's past purchased shoes.
16	Account Holder selects a pair of shoes from the list "based off past purchases".	System displays the pair of shoes and their description, type, available sizes, available colors, retailer, and price for each retailer.
17	Account Holder closes the shoe attribute window.	System displays a list of all the shoes that are similar the Account Holder's past purchased shoes.
18	Account Holder selects shoe lists page.	System displays the shoe lists page.
19	Account Holder selects shoes based off similar customers.	System displays a list of all the shoes that were purchased by other customers with similar unique profiles to the Account Holder.
20	Account Holder selects a pair of shoes from the list "based off similar customers".	System displays the pair of shoes and their description, type, available sizes, available colors, retailer, and price for each retailer.
21	Account Holder closes the shoe attribute window.	System displays a list of all the shoes that were purchased by other customers with similar unique profiles to the Account Holder.
22	Account Holder selects shoes page.	System displays the shoes page.

Alternate Courses:	Alt Step #2(System/Actor) – In the future, the BestPurchase application may allow for the selection of a different item by the user, other than shoes. If this comes to fruition, the system will display the selected item in a similar manner. Alt Step #3 (System) – If no shoes meet the Account Holder's unique profile, the system will display no shoes are available for your unique profile. Alt Step #4 (Actor) – The Account Holder will not select a pair of shoes to view, if the system displays no shoes are available for your unique profile. Alt Step #5 (System) – If no newly released shoes meet the Account Holder's unique profile, the system will display no newly released shoes are available for your unique profile. Alt Step #6 (Actor) – The Account Holder will not select a pair of shoes to view, if the system displays no shoes are available for your unique profile. Alt Step #11 (System) – If no recently added shoes meet the Account Holder's unique profile, the system will display no recently added shoes are available for your unique profile. Alt Step #12 (Actor) – The Account Holder will not select a pair of shoes to view, if the system displays no shoes are available for your unique profile. Alt Step #15 (System) – If no shoes meet the Account Holder's unique profile based off past purchases, the system will display no shoes are available based off of your past purchases. Alt Step #15 (System) – If the Account Holder does not have any past purchases, the system will display there are no past purchases associated with this account. Alt Step #16 (Actor) – The Account Holder will not select a pair of shoes to view, if the system displays no shoes are available for your unique profile or there are no past purchases associated with this account. Alt Step #19 (System) – If no shoes meet the Account Holder's unique profile based off similar customers, the system will display no shoes are available based off similar customer purchases. Alt Step #20 (Actor) – The Account Holder will not select a pair of shoes to view, if the system displays no shoes are available for your unique profile.

("Module 3," 2023) *Appendix 1*

2.2 SEQUENCE DIAGRAM

The below sequence diagram depicts the above use case from the Account Holder initially viewing the Items List Page, to ultimately viewing a pair of shoes. The below process looks at selecting an instance of the ShoesSubList class but does not specifically identify the instance. As a reminder, the instances would include the following sub lists: all shoes, newly released, recently added, based off past purchases, and based off similar customers. The diagram does not specifically dive into each of these selections, but it can be assumed that the process is the same for each one, outside of the shoes that comprise each list.



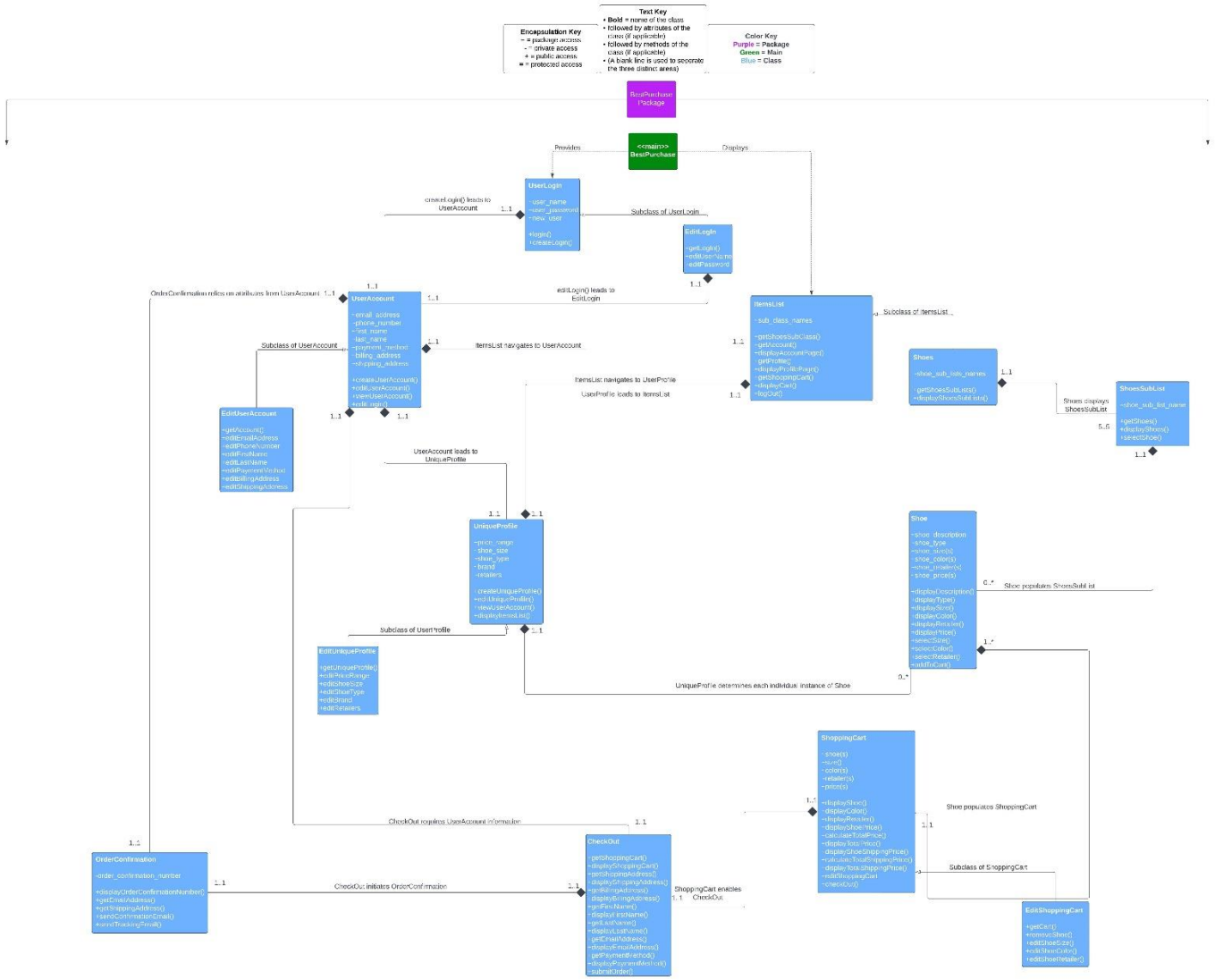
(“Module 4,” 2023; Williams, 2023)

2.3 CLASS MODEL

The below class model diagram assumes that the program is contained within the same package called “BestPurchase Package.” This is important in relation to the access level of the various attributes and methods.

The diagram itself depicts the classes in the system and their related attributes/methods. One key area to notice is the ShoesSubList class, which within the Shoes class contains five separate instances of the class, to accommodate the five different sub lists. Outside of this instance, the other classes relate to a single instance of this class. Another area of note is the instances of Shoes class that populate each ShoesSubList class and their relation to the UniqueProfile class. The instances are from zero to many, to accommodate a sub list that has no shoes that fit its criteria or a UniqueProfile that has zero instances of Shoes that match its criteria.

Lastly, there are keys at the top of the diagram to help better understand the diagram itself.



(“Module 4,” 2023; Williams, 2023)

2.4 DOCUMENTING CLASSES AND RELATIONSHIPS

2.4.1 First Business Class Selected: ItemsList

Importance for the Design:

The ItemsList class is essentially the “home page” that powers the application from a navigation standpoint. It is an essential part of the application in that it allows the user to navigate to the shoes page, which in turn allows them to access the sub lists of various shoes. It also allows the user to maintain their user account and unique profile.

Relationship with other classes:

The ItemsList class, as mentioned allows for the navigation to the Shoes subclass which in turn navigates to the ShoesSubList classes. In the ShoesSubList classes, instances of the Shoe class populate as shoes available within each sub list. If the BestPurchase application were to expand into selling items other than shoes, the ItemsList class can accommodate this by simply adding more subclasses, similar to what is currently being expressed via the Shoes subclass. The ItemsList class also allows for navigation to the UserAccount class and the UniqueProfile class. This is important because editing of the UserAccount subclass EditUserAccount will affect information related to order delivery, payment, and confirmation, while editing the UniqueProfile subclass EditUniqueProfile will determine the instances of the Shoe class that are available within each ShoesSubList class.

2.4.2 Second Business Class Selected: UserAccount

Importance for the Design:

The UserAccount is imperative to the design in that it allows for the user to specify their phone number, email address, first name, last name, payment method, billing address, and shipping address. This information is important as it pertains to completing an order through the system. This would include ensuring correct payment, shipping, delivery, and confirmation of the order. The UserAccount also allows for editing of the user’s login information.

Relationship with other classes:

The UserAccount allows for editing of the EditUserLogin class for current account holders and also is the class following the UserLogin class for new users. The UserAccount has a subclass called EditUserAccount, which allows the user to edit their UserAccount information. The UserAccount class can also be accessed from the ItemsList class, so that users can navigate to edit their UserAccount once they are an account holder. For new users, the UserAccount class is followed by the UniqueProfile class in the hierarchy of establishing their Account Holder status. The CheckOut class is dependent on the UserAccount class to successfully check out an order by supplying the Account Holder’s specific information to ensure correct payment, shipping, and delivery of their order. Lastly, the OrderConfirmation class requires shipping and email address information from the UserAccount class in order to provide a confirmation email and a tracking email.

2.4.3 Third Business Class Selected: UniqueProfile

Importance for the Design:

The UniqueProfile class is the “brains” of the BestPurchase application. The information in the UniqueProfile, in conjunction with the selected shoes sub list, determine which shoes will and will not be presented to the user. This is important, as it allows the BestPurchase application to provide tailored inventory of shoes to the user that meet their specific needs.

Relationship with other classes:

For new users, the UniqueProfile is followed by the ItemsList class, where the subclass Shoes is accessed and then ShoesSubList instances are rendered. The ItemsList class also navigates to the UniqueProfile class, where the EditUniqueProfile class allows for editing of the UniqueProfile class. For new users the UniqueProfile class follows the UserAccount class when initially attempting to become an Account Holder. Lastly, the UniqueProfile class populates the instances of shoes within the Shoe class, based off the UniqueProfile class’s attributes. These instances of the Shoe class will be segmented into their subcategories within the instances of the ShoesSubList class.

2.4.4 Non-Business Class Selected: OrderConfirmation

Importance for the Design:

In the previous documentation, the second non-functional requirement described the importance of order confirmations. This would include the added reassurance to the customer that their order was placed successfully, the increased confidence in the BestPurchase application, and the positive psychological effects of receiving an order confirmation. With these in mind, the order confirmation improves the customer experience and allows them to track their order to better anticipate its delivery.
(BigCommerce, 2023) *Appendix 2*

The OrderConfirmation class is not essential, in that the order has already been placed within the CheckOut class. This means without the OrderConfirmation class, the order can be successfully placed and delivered through the BestPurchase application. But, the class is still important to the overall user experience and for the prior reasons mentioned and described in the appendix section.

Relationship with other classes:

The OrderConfirmation class is initiated by the CheckOut class and the submitOrder() method. The OrderConfirmation class also relies on the attributes from the UserAccount class to successfully send the confirmation email and the tracking email.

CONCLUSION

The selected and revised use case provides a breakdown of a more complex and integral piece of the BestPurchase application, navigating shoe inventory. The sequence diagram provided depicts this use case. The class model diagram provides the classes, attributes, and methods to be used in the system, as well as their relation to one another. Lastly, the documenting classes and relationships section provides three business classes (ItemsList, UserAccount, and UniqueProfile) and one non-business class (OrderConfirmation). Each of these classes is described with respect to its importance for the design, as well as its relationship to other classes.

SUMMARY

In summary, this paper focuses on designing with the Unified Modeling Language (UML). It provides a revised use case and a sequence diagram for this use case. In addition, the class model diagram is included for the system. Lastly, three business classes are provided, as well as one non-business class, along with a description pertaining to their importance for the design and their relationship to other classes.

APPENDIX

Appendix 1: Original Use Case from Part 1.

Use case Name	Navigating Shoe Inventory	
Actor:	Account Holder	
Description:	This use case describes the event of an Account Holder with a unique profile on the BestPurchase application navigating the different lists of shoes. The use case will include the steps for navigating an Account Holder's shoe lists based off of their unique profile. (This use case pertains to Functional Requirement 5, including a through e). The use case will end once the account holder has viewed each list.	
Pre-condition:	User has created an account and unique profile in the BestPurchase application, and the system is currently displaying the Shoe Lists Page.	
Step #	**Actor**	**System**
1		System displays the shoe lists page which displays the following subcategories: all shoes, newly released shoes, recently added shoes, shoes based off past purchases, shoes based off similar customers
2	Account Holder selects all shoes subcategory.	System displays a list of all of the shoes that match the Account Holder's unique profile.
3	Account Holder selects shoe lists page.	System displays the shoe lists page.
4	Account Holder selects newly released shoes subcategory.	System displays a list of all of the shoes that match the Account Holder's unique profile that are newly released.
5	Account Holder selects shoe lists page.	System displays the shoe lists page.
6	Account Holder selects recently added shoes subcategory.	System displays a list of all of the shoes that match the Account Holder's unique profile that are recently added to their all shoes category.
7	Account Holder selects shoe lists page.	System displays the shoe lists page.

8	Account Holder selects shoes based off past purchases subcategory.	System displays a list of all of the shoes that are similar the Account Holder's past purchased shoes.
9	Account Holder selects shoe lists page.	System displays the shoe lists page.
10	Account Holder selects shoes based off similar customers.	System displays a list of all of the shoes that were purchased by other customers with similar unique profiles to the Account Holder.
Alternate Courses:	Alt Step #2 (System) – If no shoes meet the Account Holder's unique profile, the system will display no shoes are available for your unique profile. Alt Step #4 (System) – If no newly released shoes meet the Account Holder's unique profile, the system will display no newly released shoes are available for your unique profile. Alt Step #6 (System) – If no recently added shoes meet the Account Holder's unique profile, the system will display no recently added shoes are available for your unique profile. Alt Step #8 (System) – If no shoes meet the Account Holder's unique profile based off of past purchases, the system will display no shoes are available based off of your past purchases. Alt Step #8 (System) – If the Account Holder does not have any past purchases, the system will display there are no past purchases associated with this account. Alt Step #10 (System) – If no shoes meet the Account Holder's unique profile based off of similar customers, the system will display no shoes are available based off of similar customer purchases.	

("Module 3," 2023)

Appendix 2: Second Non-Functional Requirement / Importance of OrderConfirmation Class

BestPurchase will process its orders and display a confirmation number within 30 seconds, send a confirmation email within one minute, and send a tracking information email within 15 minutes.

BestPurchase customers need assurance that their orders were successfully placed, and adequate tracking information is provided to ensure customers can track their orders. Delays in order confirmations and/or tracking information will negatively affect the customer's buying experience and lower their confidence in BestPurchase's application.

Fast performance in displaying the confirmation number, sending the confirmation email, and sending the tracking information email, will help legitimize the BestPurchase application in the eyes of the customer. Not only do they allow the customer to confirm their order was placed correctly, but they also allow the customer to review and confirm the details of their order. This provides reassurance to the customer that their order was placed successfully and will in turn, increase their confidence in the BestPurchase application. (BigCommerce, 2023)

The order confirmation can also have a psychological effect on the buyer, by getting them more excited about their recent order. With this and the previously mentioned factors in mind, having a high-performance regarding confirmations and tracking could increase the chances a customer purchases shoes again through the BestPurchase application and/or recommends it to others. (BigCommerce, 2023)

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