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Model Driven Software Engineering
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Deliverable 2
(ONLINE BOOK STORE)

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1. Textual Description of Online Book Store

An "Online Book Store" system is a commercial enterprise that consists of an online bookstore system. This system aims to make all operations automatic for shopping a particular book. The meaning of automation in the software for shopping books online is that users can buy books without going to the physical store, waste time searching for a book and then stand in the queue to make the payment.

The main objective of the project is to design an online bookstore system, which enables the customers to search and buy a book online. As per the survey published in the Investing in the Future of Canadian books - discussion paper July, 2010, it is evident that Canadians are avid readers and they read book for leisure, interest and to improve the quality of life (85% of all readers) and for that they spend at least six hours a week[1].

The focus of our project is to give more facilities with fewer complexities to the readers of Canada who are passionate for reading and are not able to find a book in the nearest physical book store.

Objective:

- An online bookstore System is an application supporting the direct contact with the customers through web site. This System make the life of customers very easy, as they do not need to go to the bookstore physically and look for books.

- A customer can go on the website and search for the desired book by providing the details such as: book name or Author.

- The customer can register itself using a unique ID and password. A single customer can have multiple logins in Books E-Store but all logins must be unique.
- A customer can place multiple orders of books or no order at all. A customer can access the store just to look into the store

- The customer can access the profile after selecting "My account option" to update billing and shipping information or to see the past orders.

- The customer can search for the desired book by entering the book name or the author name or both. The system gives suggestions based on the information added by the customer.

- Once the customer finds the desired book, he/she can add it to the cart. When the book is added to the cart, the customer can continue to search the website for more books if he/she wishes to. If the customer finds another book, then he/she can add it to the cart. So now, both the books selected by the customers would be present in the cart.

- If the customer wants more than one copy of a particular book or if the customer wants to delete the selected book. He/She may do so by checking the cart and increasing/decreasing the number of copies of a book or deleting the book from the selection. The cart shows the total amount for the items present in the cart.

- Once the customer has finalized the books, he/she can move to "proceed to payment" button and enter the credit card details (i.e. if it has not been entered earlier in the profile). Once it is done the card details will be sent to the bank that verifies if the information added is acceptable or if sufficient funds are available. Once this is done an appropriate confirmation message would be shown whether the payment was accept or not and if the payment was accepted then an invoice would be generated and emailed to the customer.

- This system allows customers to buy books online from their home or anywhere from around the country. The customers can choose the exact book they want or search for different genres. The customers can make their payment via credit card.

2. Use Case Model

2.1 Use Case Diagram
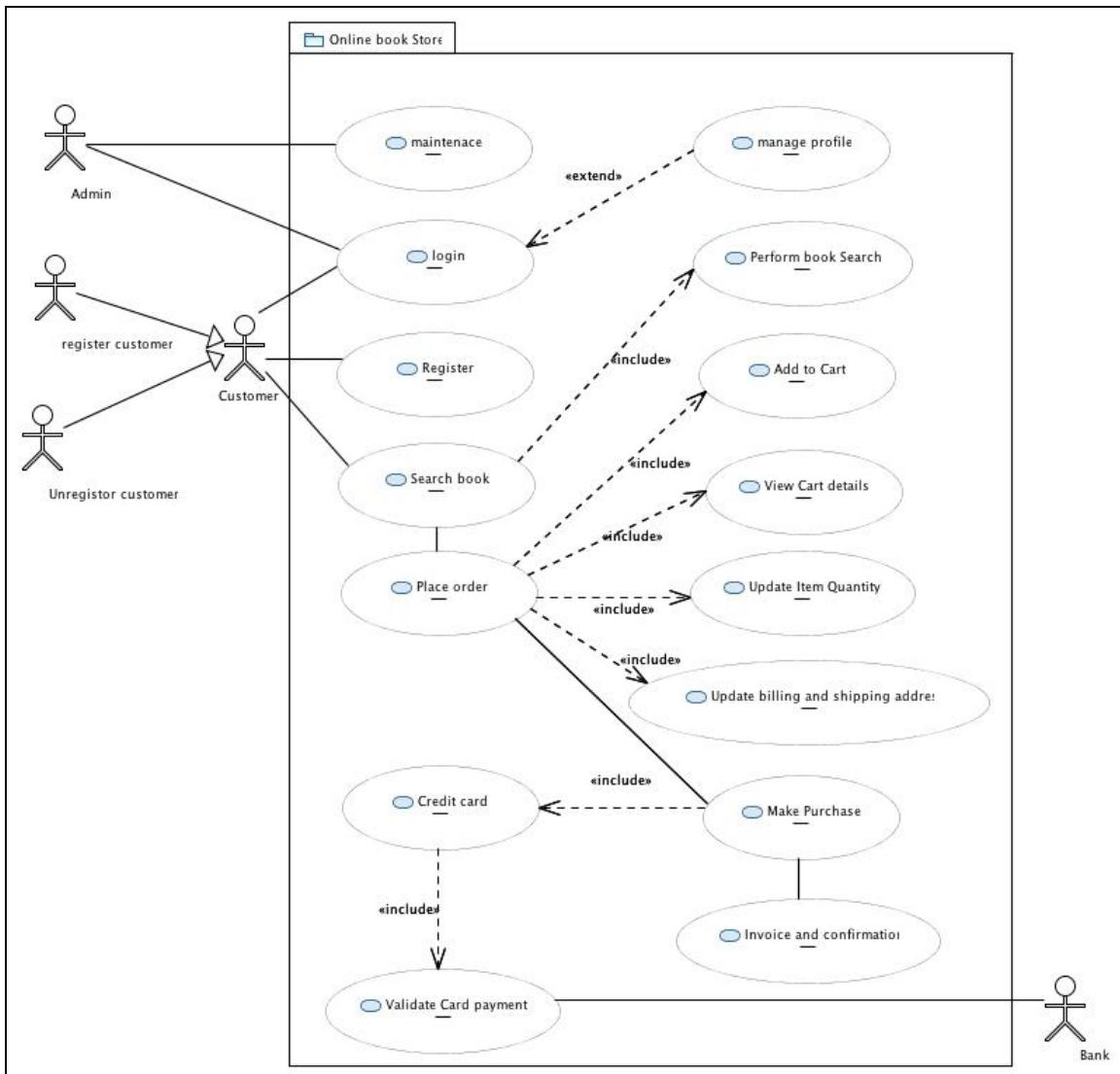
Figure 1: Use Case Model for ONLINE BOOK STORE (Papyrus).

2.2 Use Case Description

A use case model for a software system is the set of all actors, and the set of all use cases, and the relevant relationships among them. A use case model provides view of a system that emphasizes the behavior as it appears to external (or outside) users [2].

Name	Maintenance
Short Description	For the maintenance of Online Book store in terms of designing, implementing, testing, upgrading, and maintaining, database as well.
Precondition	Should have access to modify Online Book store.
Post-condition	Online Bookstore is updated with new features and information.
Error Situation	Not having an access to modify the Online Book store.
System state in the event of an error	Admin team member cannot perform the maintenance operation.
Actors	Admin
Trigger	A team member wants to make changes to the system.
Standard Process	(1) Team member accesses the web application framework or the database. (2) Team member looks for the code to be modified/changed. (3) Team member changes the code and tests the new implementation. (4) The change is approve for next release.
Alternative Process	No alternative process available
Priority	Critical

Table 1: Description of "Maintenance" Use Case

Name	Login
Short Description	The registered customers access the Online Book store Using username and password.
Precondition	Login credentials should match the customer database.
Post-condition	Registered customer and Admin can access the Online Book store.
Error Situation	Login credentials of the customer are incorrect.
System state in the event of an error	Re-enter credentials and provide help for forgotten credentials.
Actors	Registered customer and Admin
Trigger	Registered customer and Admin enters the right credentials.
Standard Process	(1) Admin and Customer enters the credentials. (2) System checks the database for credentials. (3) If credentials match, customer and admin gets an access to Online Book store.
Alternative Process	(3') The customer and admin will be asked to re-enter the credentials or gets help for forgotten credentials.
Priority	Critical

Table 2: Description of "Login" Use Case

Name	Manage Profile
Short Description	It helps Users to manage their profile in the system. For example, if User want to change their credentials then he/she can easily update their particulars in the system.
Precondition	User should register himself/herself in the system.
Post-condition	User's credentials should be updated successfully.
Error situation	(1)The user is not able to login into system. (2) The user has entered wrong credentials.
System state in the event of an error	Display a message to enter correct credentials.
Actors	User
Trigger	User proceeds to manage profile page after login.
Standard Process	(1) User logged in the system successfully. (2) User click on manage profile link to land on the page. (3) User updates his/her information successfully.
Alternative Process	No alternative process available
Priority	Major

Table 3: Description of "Manage Profile" Use Case

Name	Register
Short Description	Enables a user to get registered and have an account in the Online Book store.
Precondition	No precondition.
Post-condition	A non-registered customer will be registered.
Error situation	Customer enters improper data.
System state in the event of an error	Asks the customer to re-enter the data.
Actors	Non-registered customer
Trigger	Customer decides to register.
Standard Process	(1) Customer enters the details like username, email, and password. (2) System checks if the details are unique and correct. (3) System inserts the new customer's detail to the existing customer database.
Alternative Process	(3') If the details are incorrect, an error message is displayed and the user is asked to re-enter the details.
Priority	Critical

Table 4: Description of "Register" Use Case

Name	Search Books
Short Description	Customer looks for the required book.
Precondition	Customer has login into system (optional).
Post-condition	Customer finds or does not find the searched book.
Error Situation	Customer misspells the book/author name.
System state in the event of an error	Displays unavailability of the book to the customer and show some suggestions.
Actors	Customer
Trigger	Customer Intends to search the required book.
Standard Process	(1) Customer searches for a particular book by book name or author name. (2) Checks availability of the searched book. (3) Displays information of the book.
Alternative Process	No alternative process available.
Priority	Critical

Table 5: Description of "Search Books" Use Case

Name	Perform book search
Short Description	Customer looks for the required book.
Precondition	Customer has login into system (optional).
Post-condition	Customer finds or does not find the searched book.
Error Situation	Customer misspells the book/author name.
System state in the event of an error	Displays unavailability of the book to the customer and show some suggestions.
Actors	Customer
Standard Process	(1) Customer searches for a particular book by name of book or author name. (2) Checks availability of the searched book. (3) Displays information of the book.
Alternative Process	No alternative process available.
Priority	Major

Table 6: Description of "Perform Book Search" Use Case

Name	Place order
Short Description	Customer chooses the book; he/she wish to buy.
Precondition	Customer has logged into BOOKS E-Store and searched for the book.
Post-condition	Books selected and added to shopping cart.
Error Situation	The requested book is unavailable now It is better to say "at the time of access".
System state in the event of an error	The customer cannot select the book.
Actors	Registered customer
Trigger	Customer clicks the "Add to cart" button.
Standard Process	(1) The customer logins into the system. (2) The customer searches for the book. (3) The customer selects the book.
Priority	Critical

Table 7: Description of "Place Order" Use Case

Name	Add to cart
Short Description	Customer adds the selected book to the cart.
Precondition	Customer has login into system (optional) and selected the book.
Post-condition	Customer adds the book to the cart.
Actors	Customer

Trigger	Customer clicks the "Add to cart" button.
Standard Process	(1) Customer searches for the desired book.
	(2) Customer selects the book.
	(3) Customer adds the book to the cart.
Alternative Process	No alternative process available.
Priority	Major

Table 8: Description of "Add to Cart" Use Case

Name	View Cart details
Short Description	Customer looks at the shopping cart
Precondition	Customer has added book/s to the cart.
Post-condition	Customer gets the list of books in the cart.
Actors	Customer
Trigger	The customer clicks on "View cart" button.
Standard Process	(1) Customer clicks on Cart.
	(2) Checks the books present in the cart.
Alternative Process	No alternative process available.
Priority	Minor

Table 9: Description of "View Cart Details" Use Case

Name	Update Item quantity
Short Description	Customer edits the quantity.
Precondition	A book is already present in the cart.
Post-condition	Customer edits the quantity of the book.
Actors	Customer
Trigger	The customer updates the quantity of a particular book. The customer may increase or decrease the number of copies of a particular book.
Standard Process	(1) The Customer selects the book he/she wants to update the quantity of Items.
	(2) Customer may delete the selected book.
Alternative Process	No alternative process available.
Priority	Minor

Table 10: Description of "Update Item Quantity" Use Case

Name	Update Billing and Shipping details
Short Description	Customer updates the billing and shipping details
Precondition	
Post-condition	Updated billing and shipping information.
Actors	Customer
Trigger	The customer updates the billing details (i.e. credit card details and the bank) and the shipping details.
Standard Process	(1) Customer logs into the system. (2) Customer enters the billing information. (3) Customer enters the shipping details.
Alternative Process	No alternative process available.
Priority	Major

Table 11: Description of "Update Billing and Shipping Details" Use Case

Name	Make Purchase
Short Description	This use case describes that the system will be able to generate the total amount for the books selected by the customer.
Precondition	Customer must have selected a minimum of one book and it should be added in the cart.
Post-condition	The system generates the total amount and the customer fills in the credit card details for payment.
Actors	System
Trigger	The customer clicks "Proceed to payment" button.
Standard Process	(1) The system retrieves the customer information. (2) The system will check if a borrower is register in the system. (3) The system adds all the fees that appear in the shopping cart to the customer's account. (4) The system updates the borrower record with the newly calculated fees. (5) The system updates the database. (6) The system notifies via e-mail the borrower about the fees.
Alternative Process	No alternative process available.
Priority	Major

Table 12: Description of "Make Purchase" Use Case

Name	Invoice and Confirmation
Short Description	This use case describes that the system generates receipt/invoice for the customer
Precondition	The customer pays for the items present in the shopping cart.
Post-condition	The system generates the invoice for the paid items.
Actors	Customer
Trigger	Payment accepted.
Standard Process	(1) System generated the receipt for the customer. (2) System updates the customer's record with the generated receipt/invoice.
Alternative Process	No alternative process available.
Priority	Major

Table 13: Description of "Invoice and Confirmation" Use Case

Name	Validate card Payment
Short Description	This use case describes that the bank validates the card payment made by the customer.
Precondition	The customer makes the payment via credit cards
Post-condition	Success end condition: 1. Customer attempts to make the payment for the book(s). 2. Customer pays via credit card. 3. Bank validates the card. 4. Bank accepts the payment 5. System updates the database Failure end condition: 1. Customer not providing valid card information or insufficient funds. 2. Bank unable to validate card information 3. System notify Customer with an error message
Actors	Bank
Trigger	The customer has clicked on "Proceed to payment" button after entering the necessary card and shipping details.
Standard Process	1. Customer retrieves the payment total 2. Customer pay the total amount through card 3. Bank validates the card 4. Bank deducts amount from the card 5. System updates the database 6. System generates receipt 7. System notifies Customer the payment information via email

Alternative Process	No alternative process available.
Priority	Critical

Table 14: Description of "Validate Card Payment" Use Case

Name	Cancel Order
Short Description	The customer wants to cancel the order.
Precondition	Payment is approved for the order but the order is yet to be shipped for delivery.
Post-condition	Order is cancelled and refund has been initiated through concerned bank.
Error Situation	The order is already in transit.
System state in the event of an error	The customer cannot cancel the order once it is shipped.
Actors	Customer
Standard Process	(1) The customer logs in and views all the orders. (2) The customer selects a particular order. (3) The customer chooses to cancel the order. (4) The customer provides a reason of cancelling the order. (Optional)
Alternative Process	No alternate process available.
Priority	Minor

Table 15: Description of "Cancel Order" Use Case.

3. Priority Scheme

The identified four levels to prioritize the stakeholders for Online Bookstore system priority of whom is illustrated in the below graph.
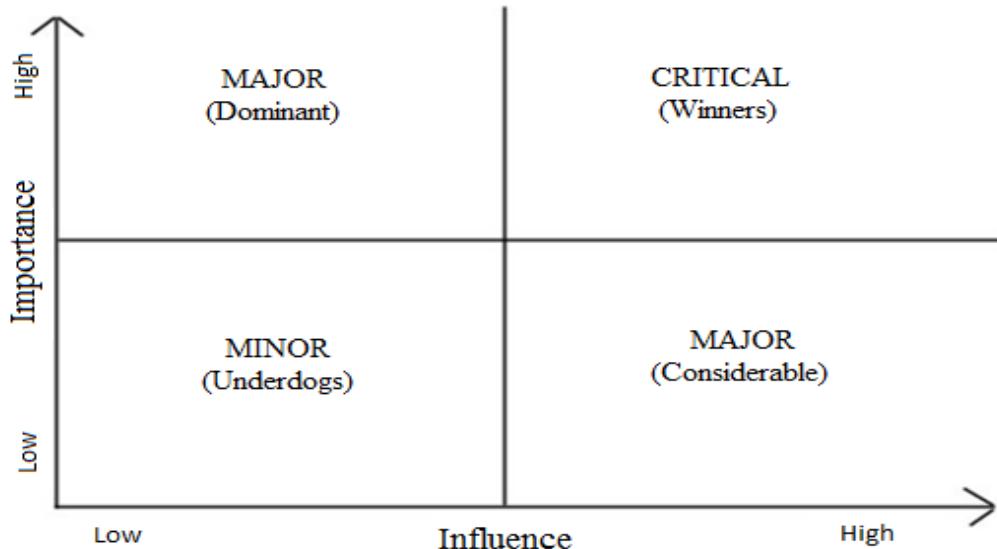

Figure 2. A Use Case can have a Minor, Major, or Critical priority.

4. Functional requirements

Function requirements are from the systems point of view that is how the system is going to achieve the different objectives [3].

3.1 Account Registration
The system shall allow a non-registered user to create a secure account.

3.2 Account Login
The system shall allow the registered user to log into their account after verifying password and username.

3.3 Search Books
The system shall allow the user to search for books by title and author. The result will include a picture of the front cover, along with the title, author and price.

3.4 Add to Shopping Cart

The system shall allow a registered or an unregistered user to temporarily save books that are being considered for purchase into a list associated with their account. When viewing the shopping cart list, it displays the total price for the books in the cart.

3.5 Delete from shopping cart

The system shall allow a registered or unregistered user to remove any unwanted book from their shopping cart. The system shall provide the user a way to select one of the books in his/her cart. After the user has indicated the particular book to be deleted from the shopping cart, the stored list representing the shopping cart should be updated to show only the books remaining in the cart.

3.6 Place order

Once the customer has finalized the books he/she want to buy, they shall proceed to checkout, and the system shall place the order and send the credit card details to the bank. Once the funds are verified by the bank the system shall provide the necessary information to the customer i.e. if the purchase is successful or not.

3.7 Contact Us

The system shall allow a user to view various methods of contacting the store. The system shall display the telephone number, email address and hours of operation.

3.8 Update Account Information

The system shall allow the user to update the information in their account. The user shall be allowed to view and change their name, mailing address, billing address, credit card information. The user shall be allowed to change the password by entering the old one once and the new one twice.

3.9 View Account Purchase History

The system shall allow a registered user to view purchases made with their account within the last two years. The system shall display the title of the book, price and quantity of each book purchased in a given order.

3.10 Account Logout

The system shall allow the registered and logged-in user to exit his/her account, so that accesses to operations requiring a user to be logged in are now disabled.

3.11 Invoice and confirmation

Invoice is generated once the payment is successful and verified by the bank.

5. Non-functional requirements:

To meet the desired quality the system should adhere to the following nonfunctional requirements. There are requirements that are not functional in nature. Specifically, the system must work within these constraints[4].

4.1 Usability:
The system should be easier to learn, operate and shall assist the user.

4.2 Reliability:
The system should handle expected and non-expected errors in a way that prevents loss in information.

4.3 Performance:
The system shall accommodate high number of books and users without any fault.

4.4 Maintainability:
It represents the ease with which the system can be modified i.e. to improve or make changes to it.

4.5 Testability:
It is the degree to which a software supports testing in a given context.

4.6 Security:
System will use secured DB. System will have different types of users and every user have access constraints. After entering the username and password, the user can access his profile.

6. Tools Used In Deliverable

Besides using regular word processing applications, we have used the following tools for communication, document sharing and producing diagrams- google drive, WhatsApp, Gmail, GIT HUB, Microsoft Word and Papyrus.

7. Glossary

C

Customer
A customer is the recipient of a good, service, product, or idea, obtained from a seller, vendor, or supplier for a monetary or other valuable consideration.

O

Online Store
It is the place where people can buy merchandize, at anytime, anywhere.

R

Registered Customers: They are customers who have an account in the system for accessing the web with every feature of the system.

S

Shopping Cart
A shopping cart is a cart supplied by a shop for use by customers.

U

Unregistered Customers: They are customers who have not account in the system but can access the web but with lesser features.

8. References

[1]. "**Canadian Heritage**" 2008 Canadian Books Readership Study, Decima Research - http://www.pch.gc.ca/DAMAssetPub/DAM-livres-books/STAGING/texte-text/discuss-paper_1279033118003_eng.pdf?WT.contentAuthority=12.2.1

[2]. https://en.wikipedia.org/wiki/Use_Case_Diagram

[3]. https://en.wikipedia.org/wiki/Functional_requirement

[4]. https://en.wikipedia.org/wiki/Non-functional_requirement