

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Faculty of Science



5th semester Mini Project Report

On

PAIGE (Buy, Sell and Rent Used Books)

Guided by

Mr. Kshitij Tripathi

In fulfillment of the degree

Of

Bachelors of Computer Applications

In

Department of computer Applications

Submitted by:

kamakshi Nanda -522042

Riddhi Batas -522006

Pruthvin Jhaveri-522026

Jayati Goswami-522021

The Maharaja Sayajirao University of Baroda

Faculty of Science

Department of Computer Applications.



MINI-PROJECT

PAIGE (Buy, Sell and Rent Used Books)

Date: 16th December, 2019

Pruthvin Jhaveri
Seat no:522026

Kamakshi Nanda
Seat no:522042

Riddhi Batas
Seat no:522006

Jayati Goswami
Seat no:522021

Invigilator Signature_____

INTORQUE

Certificate of Completion

I hereby affirm, to the best of my knowledge and belief, based on inspections, observations, testing of the project and upon reports submitted by others, that this PAIGE is substantially complete and operable. The project was completed in accordance with the guidelines issued by the company.

PROJECT MANAGER INFORMATION

Biraj Shah

INTORQUE

Computer support services

305, Synergy Tower, corporate road, Makbara, Ahmedabad, Gujarat 380015

PROJECT NAME

PAIGE (Buy, Sell and Rent Used Books)

PROJECT DESCRIPTION

Paige is an online platform providing the users to buy sell and rent used books by providing a medium to connect directly with each other for smoother transactions.

Construction begin date: 23rd July, 2019

Substantial completion date: 31st January, 2019

Physical completion date: 23rd December, 2019

Completion date: 24th December, 2019

Certificate
[Include Stamp]



By Date: 15th December 2019

305, Synergy Tower, corporate road, Makbara Ahmedabad, Gujarat 380015
www.intorque.com

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In completing this mini project, we have been fortunate to have help, support and encouragement from many people. We would like to acknowledge them for their cooperation.

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We would also like to thank all our teachers and family members and friends for helping, bearing, encouraging and boosting our morale, throughout our studies, especially during the project period. Last but not the least we would like to express our sincere gratitude to those who helped us in completing our project directly or indirectly.

Abstract

The business-to-consumer aspect of electronic commerce (e-commerce) is the most visible business use of the World Wide Web. The primary goal of an e-commerce site is to sell goods and services online.

This project deals with developing an e-commerce website for Online Book Sale. It provides the user with a catalogue of different books available for purchase in the store. In order to facilitate online purchase a shopping cart is provided to the user. The system is implemented using a 3-tier approach, with a backend database, a middle tier of server and JSP, and a web browser as the front end client.

In order to develop an e-commerce website, a number of Technologies must be studied and understood. These include multi-tiered architecture, server and client side scripting techniques, implementation technologies such as JSP, programming language (such as JAVA, JavaScript, and HTML), relational databases (such as MySQL, Access).

This is a project with the objective to develop a basic website where a consumer is provided with a shopping cart application and also to know about the technologies used to develop such an application.

This document will discuss each of the underlying technologies to create and implement an e-book store.

Business Problem

In the world of software development there lots of improvement in the area of Architectural design and principles. The philosophies and implementation details are changing as the people guiding the development of the application. In this fantastic and yet sometimes complex world of software development there are some tried and true architecture patterns and software development guidelines employed by most architects. Also your design must have an ability to turn towards innovation instead of lending itself to common practices. Web services are one such area where architects must lean on their creative side and hope that their solutions are still successful. In this report we will explain an exciting voyage down the road of Web services application. From requirements to use cases, to database design, to component frameworks, to user interfaces, we will cover each and every aspect of system design required to build an application with collaborative Web services. The reason why we selected online Bookstore web service is everybody walking down the street has some idea about bookstores. The objective of this project is to develop an e- book store where books can be bought from the comfort of home through the Internet.

An online book store is a virtual store on the Internet where customers can browse the catalogue and select books of interest. The selected books may be collected in a shopping cart. At checkout time, the items in the shopping cart will be presented as an order.

Project Charter

1. Project Definition:

Online buying, selling and renting of second hand or used books.

2. Purpose:

- To sell, rent or shop while being in the comfort of your own home, without having to step out of door.
- Add your favorite products in the wish list and get notified every time any related product is found.
- Connect directly with the seller, chat and then decide the next step.
- Meet the seller at your mutually decided date, time and venue.
- Search for books directly and get instant results.

3. Project Scope:

The Online book store with the specifications of buy, sell and rent is easy to maintain, ready to run, scalable, affordable and reliable cost saving tool from software associates suited for every business.

The proposed system can be used even by the naïve users and it does not require any educational level, experience and technical expertise in computer field but it will be of good use if the user has the good knowledge of how to operate a mobile/computer device.

It consists of various features such as:

1. Sell Book
2. Buy Book
3. Rent
4. Wish list
5. Chat box
6. Book Suggestions Using Cookies
7. The user can only view books if he/she has not registered into our web application.
8. The user can login to buy ,sell and rent books.
9. If the user selects to sell the book, he will have to click on the sell option and then will have to fill a form that asks for information about the book. If everything goes well then the book will be added in our database and will be available on the Web application.
10. If the user wants to buy or rent a book he/she can surf or search books by their category, book name, ISBN, author etc.
11. The buyer and seller can contact each other using our chat box or by email or phone.

4. Team Size:

4 people

Project Plan

1.Objective:

To develop a working full-fledge e-commerce website for buying, selling and renting second hand or used books.

2.Software Model-Traditional:

- We have used incremental model to create our application.
- We gathered client's requirements, then created a prototype and then kept changing the software in each increment according to the Incremental approach.

3.Work division (w.r.t time):

July

1. Requirement gathering.
2. Planning.
3. Diagrams (Use-case, Activity, Sequence)

August

1. Database designing.
2. Login.
3. Sign up.
4. Forgot password.
5. Logo designing.

September

1. Homepage
2. UI designing for selling forms.
3. Implementation of compression.
4. Implementing Google API to fetch book details from its ISBN number.
5. Cart

October

1. UI designing for Shop page.
2. Filters.
3. Search bar.

4. Error Page.
5. Implementing Java mail API and using SMTP server to send emails.

November & December

1. Edit Details page.
2. Chat box.
3. Product description page.
4. Used SSH-256 for cryptography.
5. Added re-captcha service to many forms.
6. Tested modules.
7. Data Entry

4.Work division (w.r.t team members):

- i. Kamakshi Nanda-Backend, frontend, documentation, database
- ii. Riddhi Batas-Backend, documentation, frontend, database
- iii. Pruthvin Jhaveri-Frontend, documentation, database, backend
- iv. Jayati Goswami-Frontend, database, documentation, backend

Hardware and Software Requirements

1.Hardware:

- I. Laptops/PCs

2.Software:

- I. Web Browser
- II. Server
- III. Database

Tools and Technologies Used

I. Front end

- a. Language: HTML, CSS, JavaScript, Bootstrap
- b. Tool: Notepad++, Bootstrap Studio, Dreamweaver2019

II. Back end

- a. Language: Java
- b. Tool: Net beans
- c. Database: MySQL
- d. Server: Tomcat/GlassFish

Requirement Analysis and System Analysis

1. Module Specification:

1. Registration
2. Login
3. Search Book
4. Buy/Rent Book
5. Edit Profile
6. Chat Box
7. Sell Book
8. Home page with product catalog

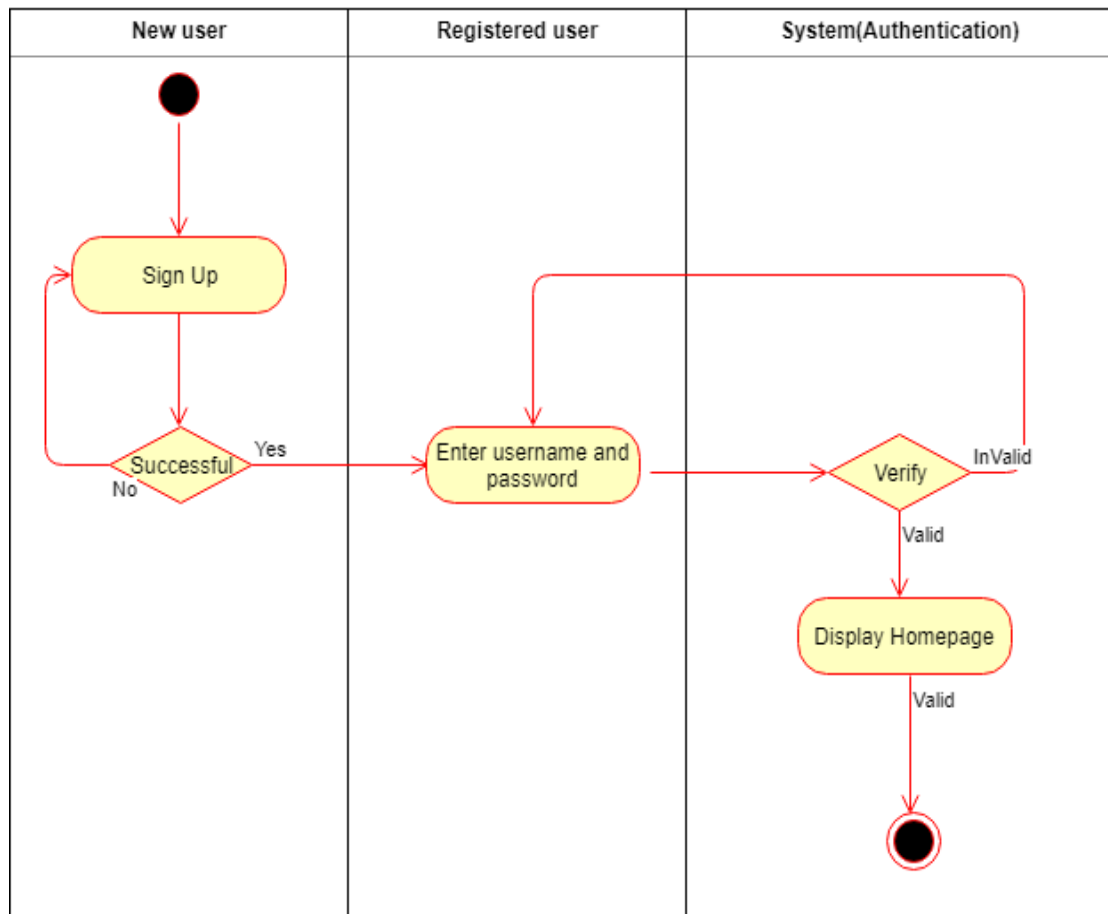
2. System Flow:

1. Use Case Diagram:

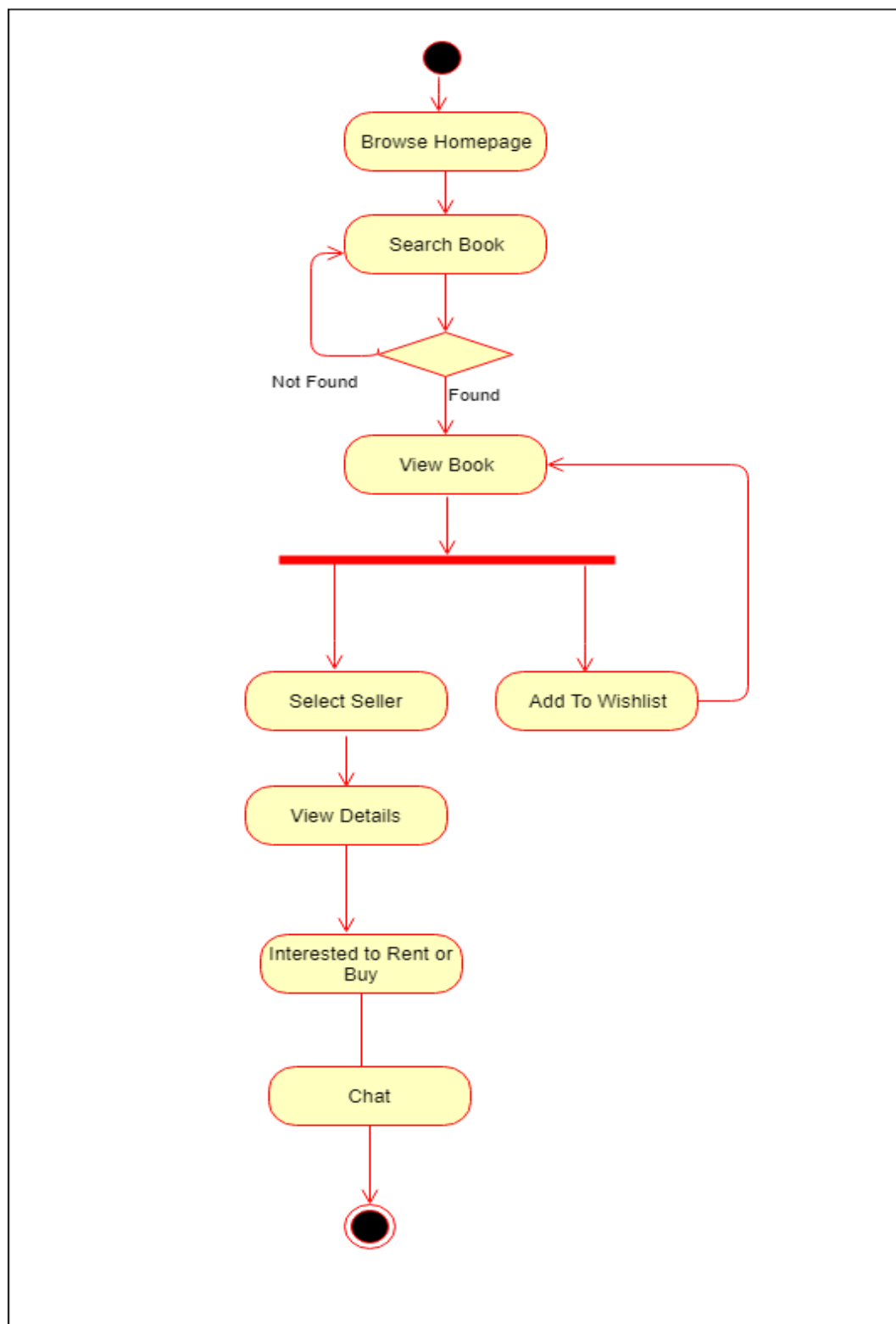


2.Activity Diagram:

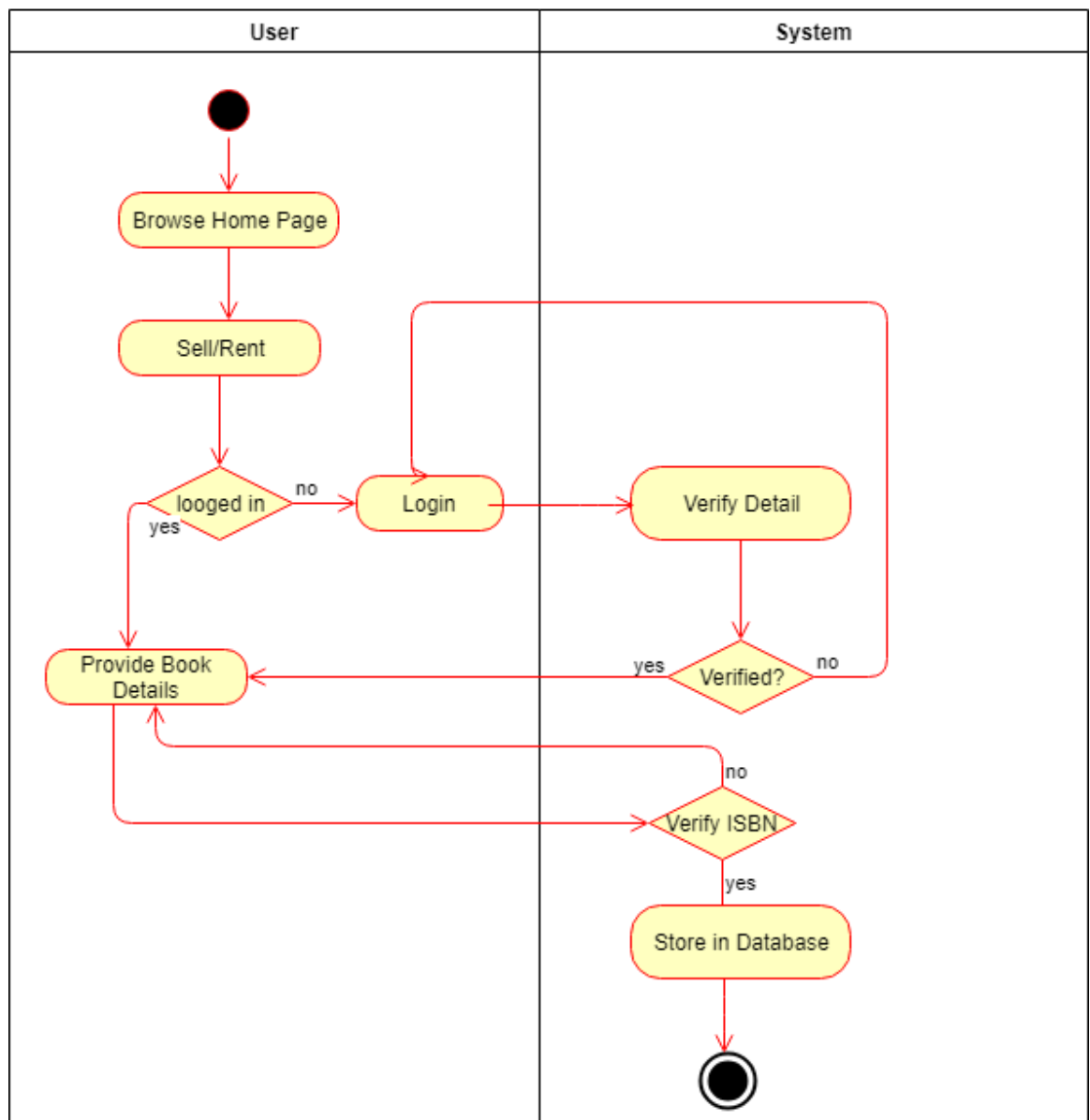
Login/signup activity



Buy/Rent Book Activity

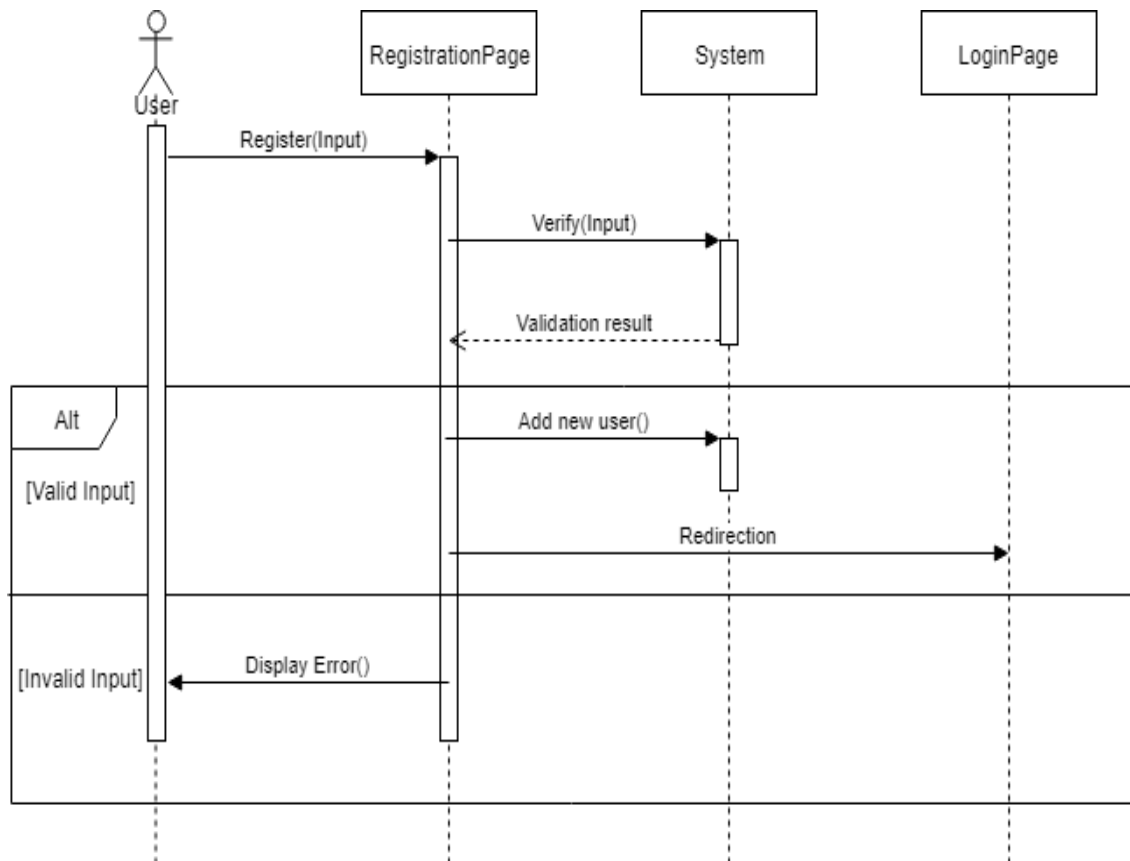


Sell/Rent Book Activity

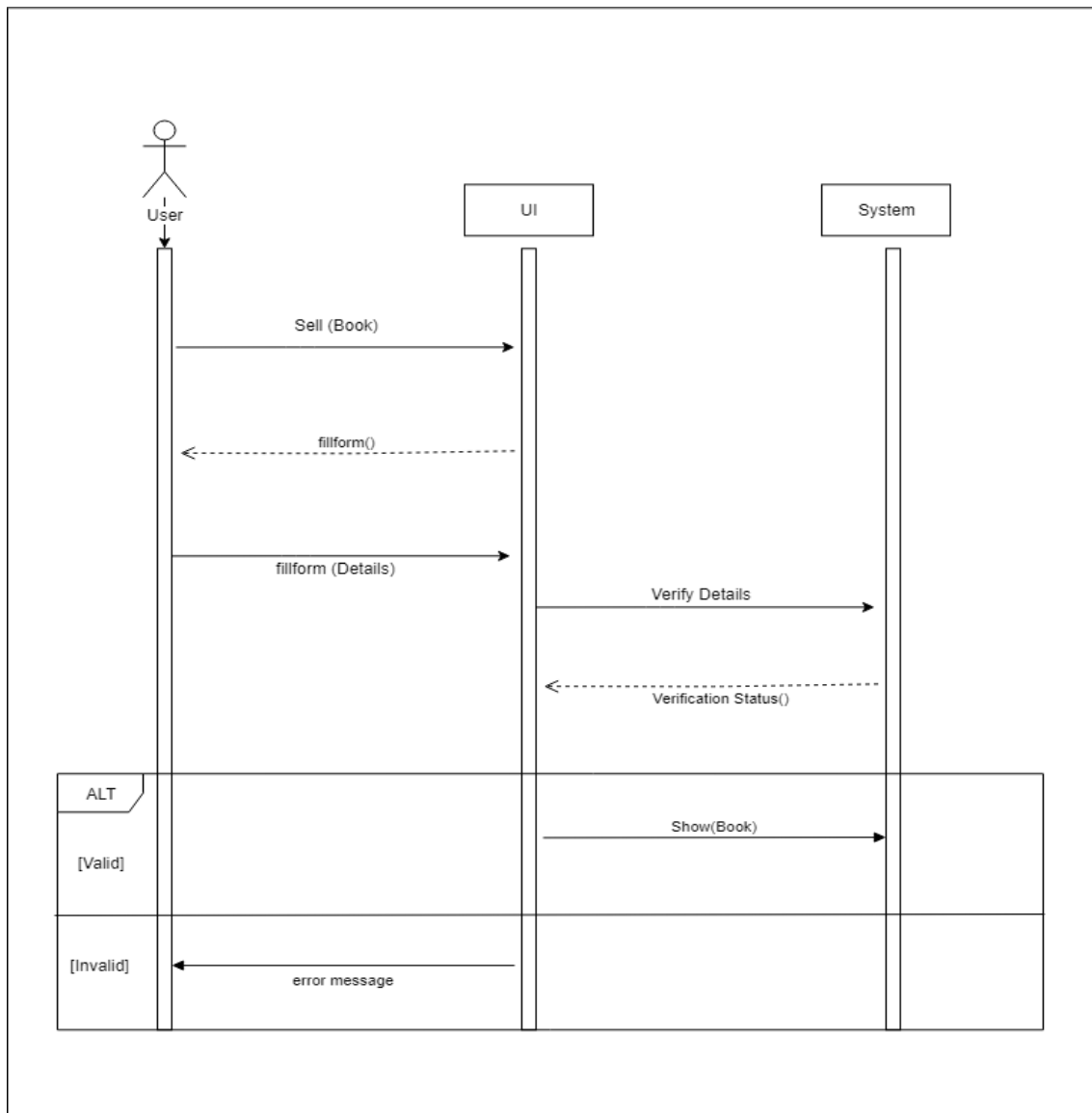


3.Sequence diagram:

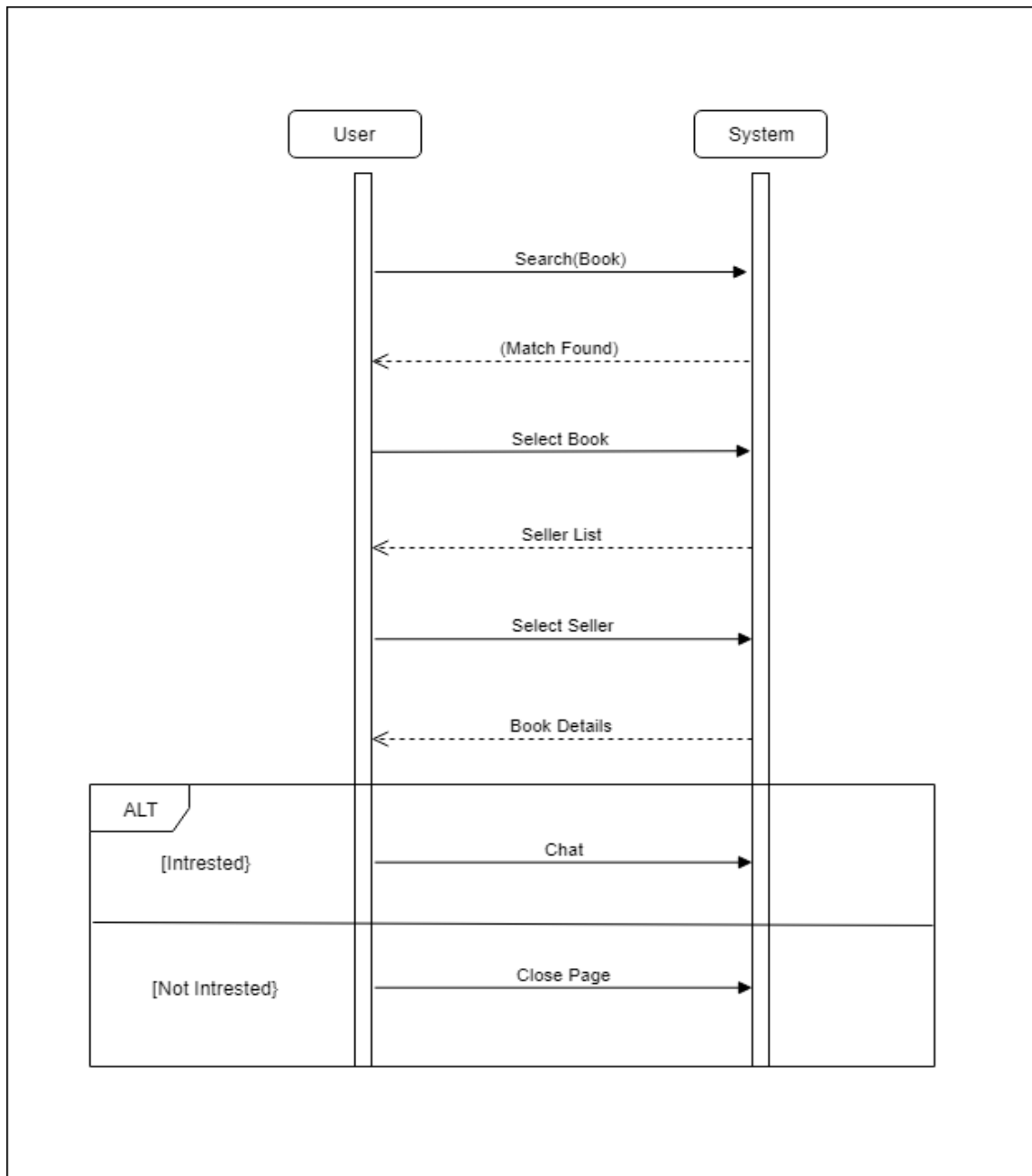
i. Registration:



ii. Sell Book:



iii. Buy/Rent Book:



3.Data Modeling:

a. Data Dictionary:

book

Column	Type	Null	Default	Comments
ISBN (<i>Primary</i>)	varchar(13)	No		
title	varchar(100)	No		
image	text	No		
author	varchar(80)	No		
publisher	varchar(80)	No		
published	varchar(80)	No		
category	varchar(100)	No		
description	longtext	No		
pageCount	varchar(10)	No		
averageRating	varchar(10)	No		
ratingsCount	varchar(10)	No		
maturityRating	varchar(20)	No		

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	ISBN	0	A	No	

Languagecodes

Column	Type	Null	Default	Comments
code	varchar(2)	No		
language	varchar(20)	No		

Ratings

Column	Type	Null	Default	Comments
sId (<i>Primary</i>)	varchar(10)	No		
bId (<i>Primary</i>)	varchar(10)	No		
Rating	int(11)	No		
Review	Text	No		

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	sId	0	A	No	
				bId	0	A	No	
bId	BTREE	No	No	bId	0	A	No	

Seller

Column	Type	Null	Default	Comments
id (<i>Primary</i>)	varchar(10)	No		
mobNo	varchar(10)	No		
State	varchar(50)	No		
City	varchar(20)	No		
Pincode	varchar(6)	No		
displayPhone	tinyint(1)	No		
displayEmail	tinyint(1)	No		

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	0	A	No	
mobNo	BTREE	Yes	No	mobNo	0	A	No	

Sellerbook

Column	Type	Null	Default	Comments
ID (<i>Primary</i>)	varchar(10)	No		
ISBN (<i>Primary</i>)	varchar(13)	No		
uploadDate	datetime	No		
category	varchar(30)	No		
bookCondition	varchar(30)	No		
language	varchar(20)	No		
binding	varchar(20)	No		
frontCover	longblob	No		
backCover	longblob	No		
indexPage	longblob	No		
isbnPage	longblob	No		

randomPage	longblob	No		
description	text	No		
originalPrice	int(11)	No		
sellingPrice	int(11)	No		
rent PerDay	int(11)	No		

[user](#)

Column	Type	Null	Default	Comments
id (Primary)	varchar(10)	No		
fullName	varchar(254)	No		
Email	varchar(254)	No		

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	0	A	No	

[Validategoogleuser](#)

Column	Type	Null	Default	Comments
id (Primary)	varchar(10)	No		
idToken	longtext	No		

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	0	A	No	

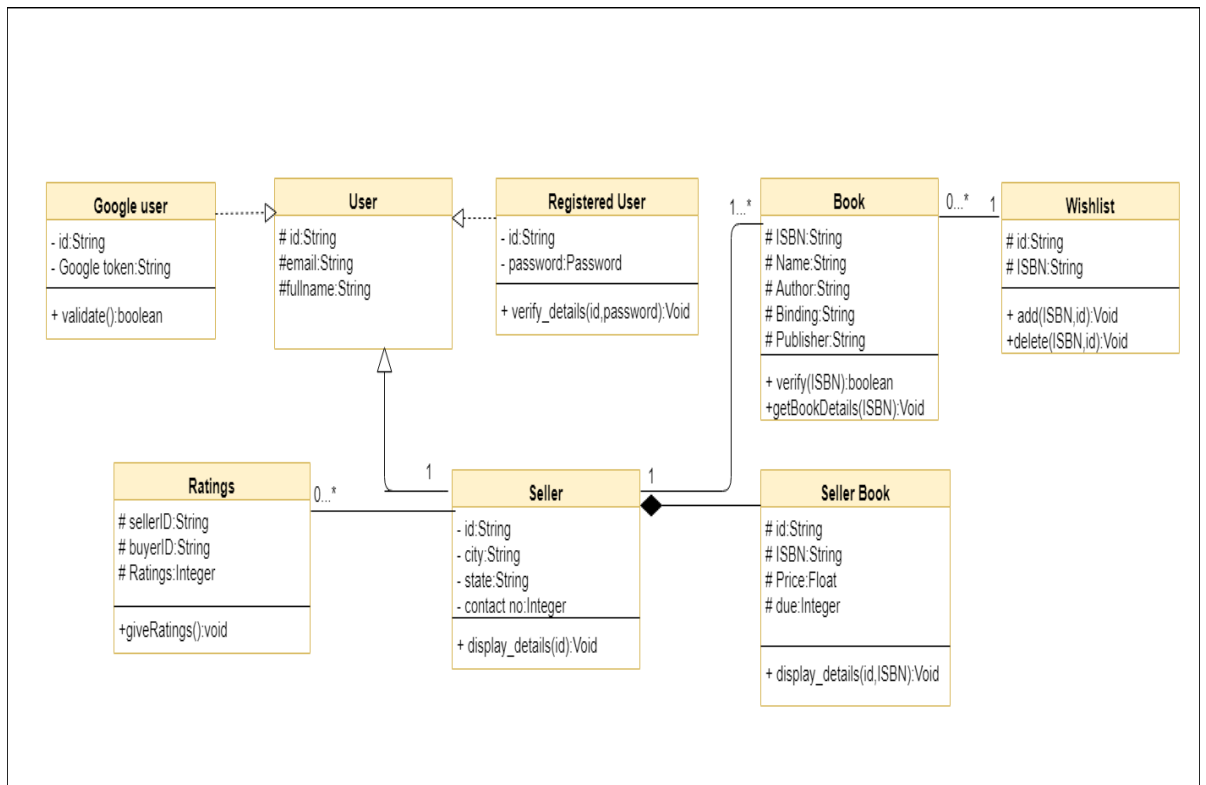
[Validatepassword](#)

Column	Type	Null	Default	Comments
id (Primary)	varchar(10)	No		
password	varchar(64)	No		

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	0	A	No	

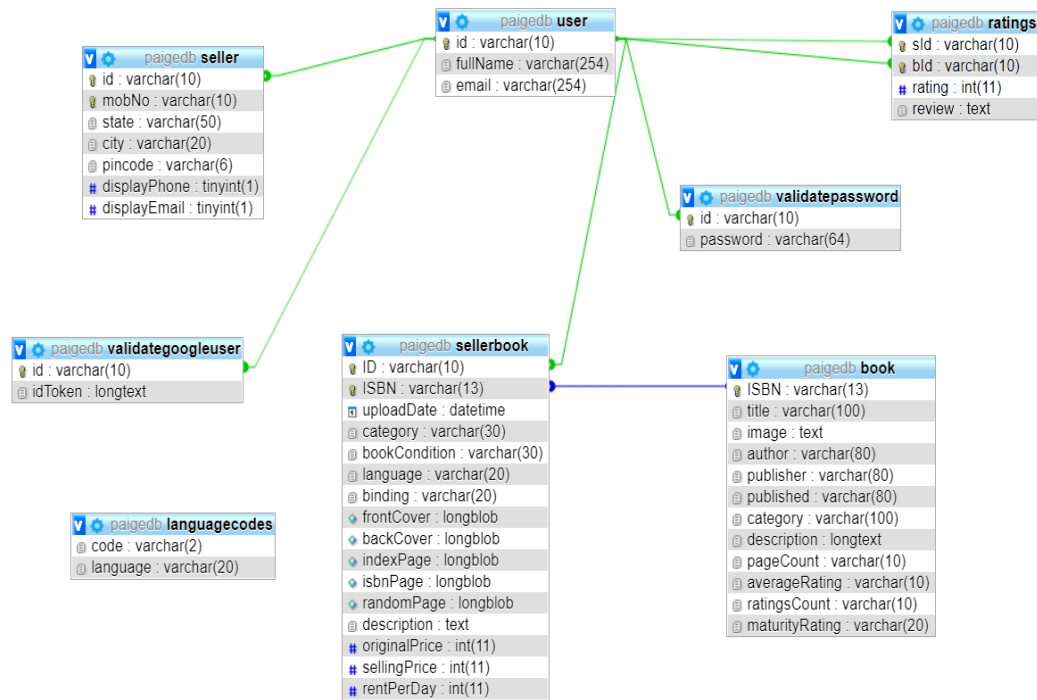
b. Class Diagram:



System Design

1.Database Design:

a. Table and relationships:

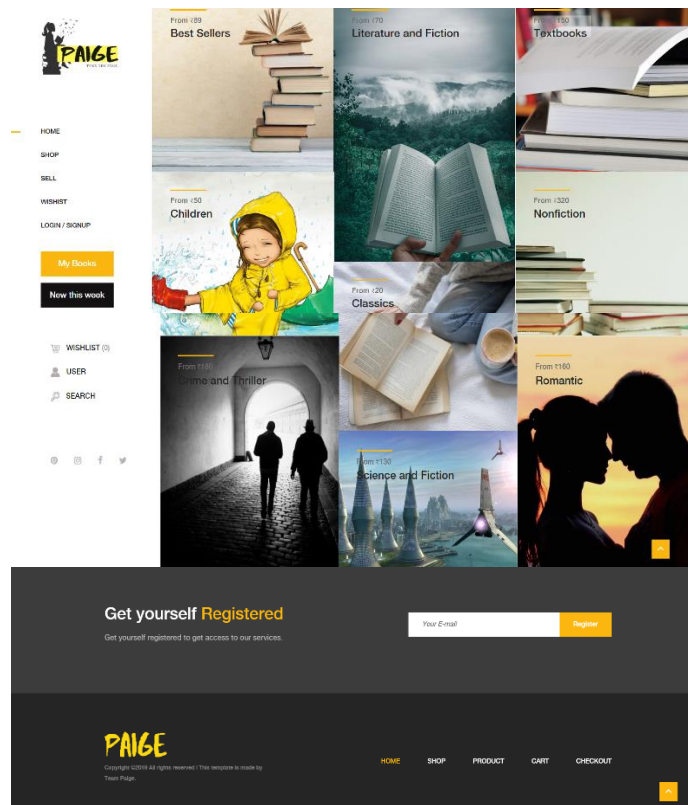


2.Interface Design:

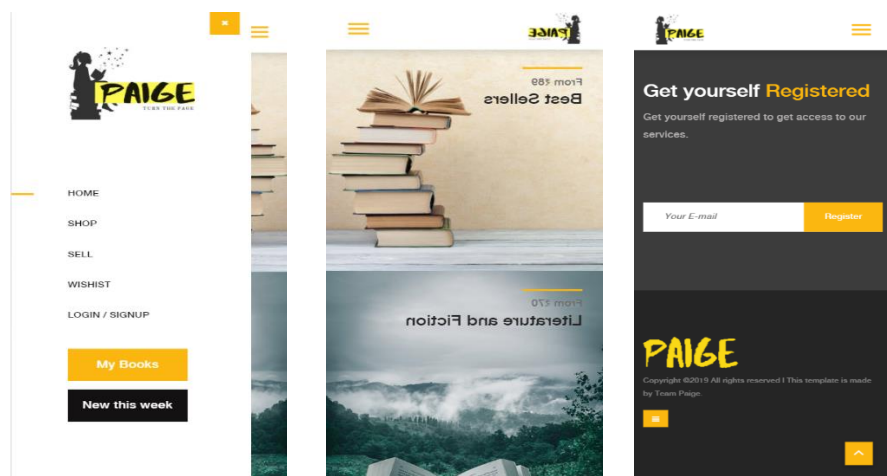
a. Screenshots and Explanations:

1. Homepage

a. Web view:



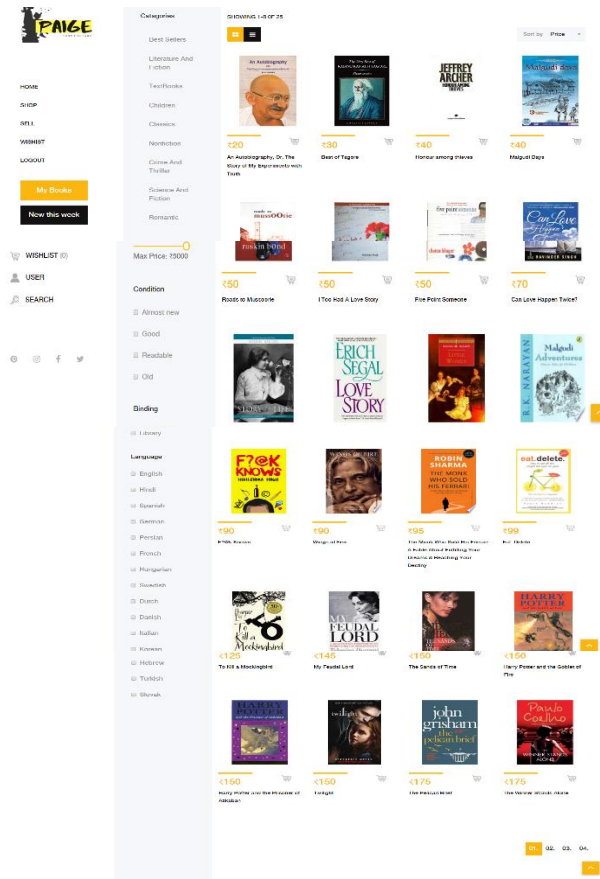
b. Mobile view:



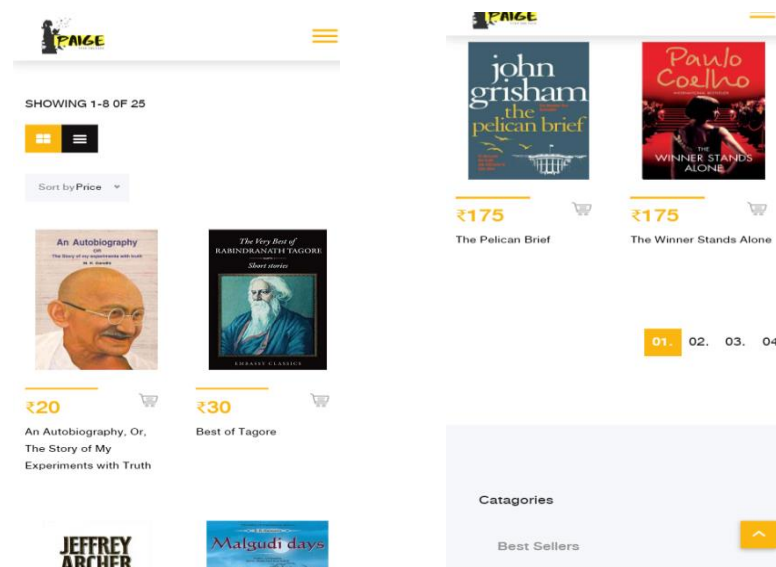
- From the homepage user can select any category and view books in that category.
- The user can also navigate to other pages i.e. “shop”, ”sell”, ”wish list”, “login/signup” etc through the side navigation bar.

2. Product catalog:

a. Web view:

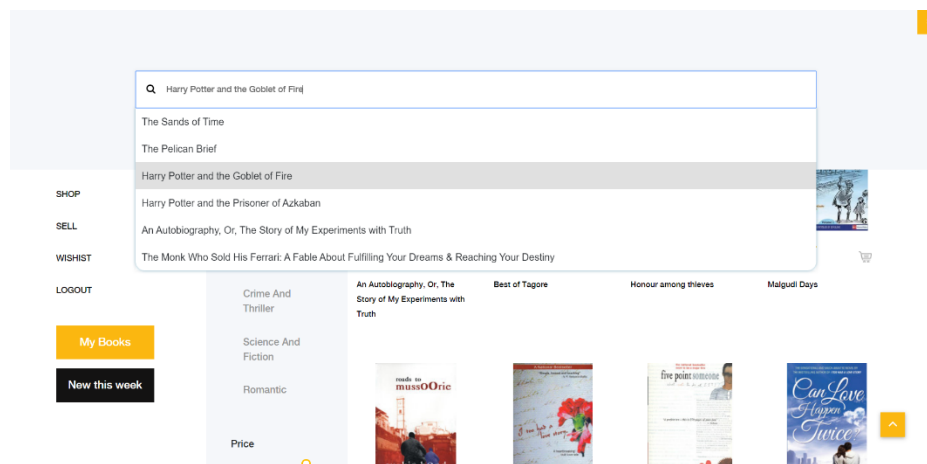


b. Mobile view:



- User can view all the books on the shop page.
- Filters like category, price, language etc can be used to find out books of your interest more easily.
- Sort parameters like price, newest, popular can be used to sort books.
- User can scroll between pages by the page the page change buttons provided on the bottom of the page.
- User can click on any book to get its further details.
- User can also add books to his/her wish list.

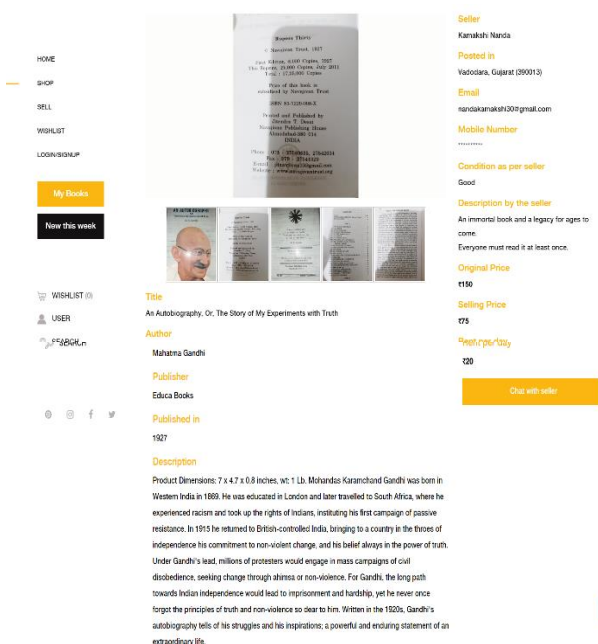
3. Search:



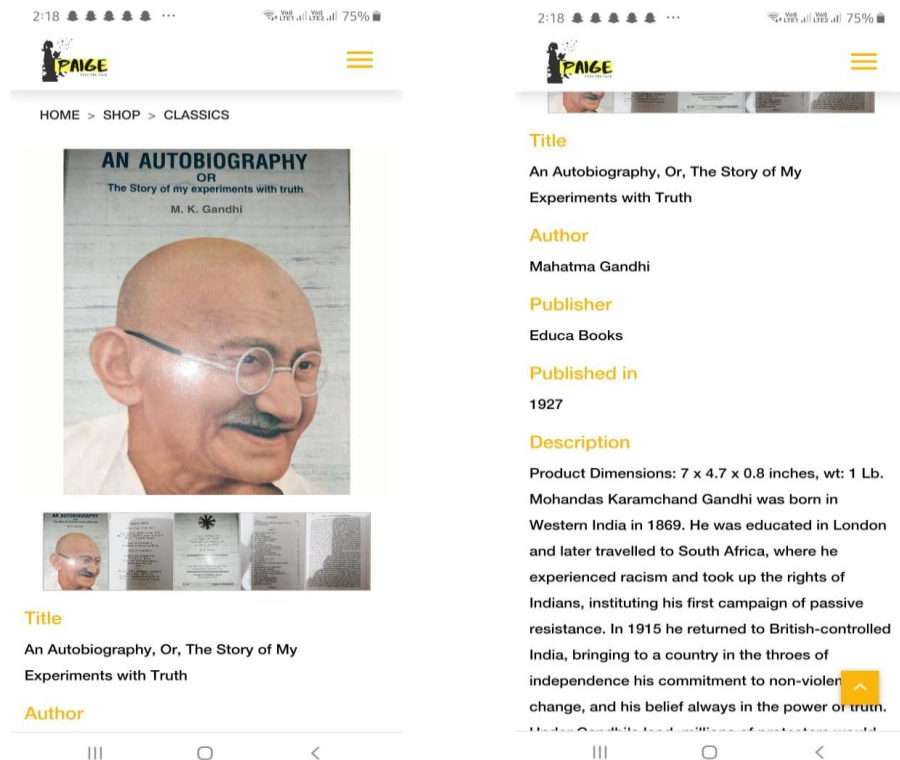
- User can also search for books by author, title etc with the help of the search box.

4. Product description (This page is opened when user clicks on a book.)

a. Web view:



b. Mobile view:



- User can view description of the book like its author, seller, publisher etc.
- User can also chat with the seller.

5. Sell:

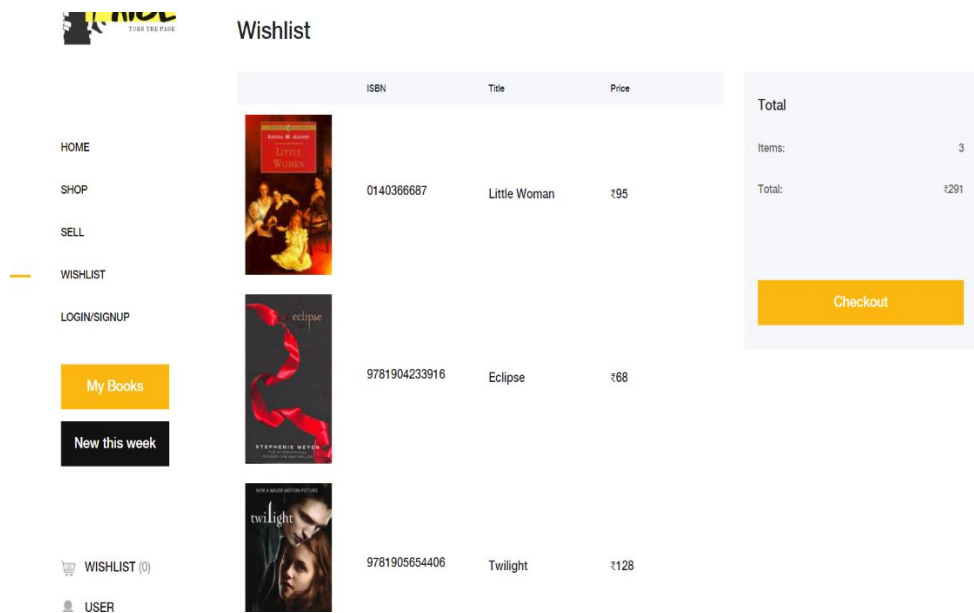
The image shows a mobile app interface for a 'Sell' section. It features a 'Complete your details' form with the following fields: Name (Kamakshi, Nanda), Email (nandakamakshi30@gmail.com), Location (India, Andaman & Nicobar Islands, Port Blair), Pin Code, and Mobile No. There are checkboxes for 'Show my email address on my ads' and 'Show my phone number on my ads'. A 'Submit' button is at the bottom. The left sidebar shows navigation options: HOME, SHOP, SELL (highlighted), WISHLIST, and LOGOUT. Below the sidebar are buttons for 'My Books' and 'New this week', and a 'WISHLIST (0)' button.

- To sell a user must Log in into our website, if without logging in user tries to open sell page he/she is redirected to the login page.

- If a verified user tries to sell a book for the first time, the user is asked to complete details through the above form.

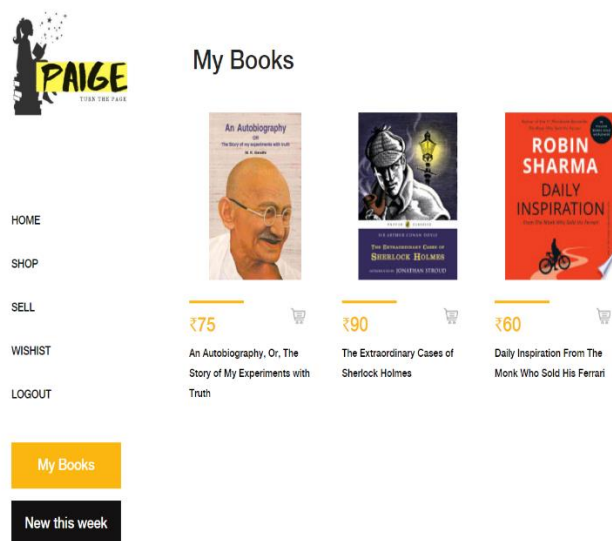
- Once the user completes his/her details, information about the book to be sold is required.
- We only ask the user for the user specific book details and its ISBN number, general details are fetched by our application using the ISBN number.
- User can view the general details of his/her book by the “Details” button.
- The images of book’s pages uploaded by the user can be of any size, user need not compress those images. User’s images are compressed by our application before storing it into the database.

6. Wishlist:



- User can store and view books of his/her interest into the wish list.

7. My Books:



- User can view books uploaded by him/her on this page.

8. User Page:

The screenshot displays the 'User Page' of an application. On the left is a vertical navigation menu with options: HOME, SHOP, SELL, WISHLIST, LOGOUT, My Books (highlighted in orange), and New this week (highlighted in black). Below these are links for WISHLIST (0) and USER. The main content area is titled 'Account details' and contains a list of user information fields, each with an 'edit' link and a checkmark icon. The fields are: Name (Kamakshi), Last Name (Nanda), Email Address (nandakamakshi30@gmail.com), Country (India), State (Gujarat), City (Vadodara), Pincode (390013), and Phone Number (7202016793). At the bottom right of the details section is a large orange 'Save' button.

Field	Value	Action
Name	Kamakshi	edit ✓
Last Name	Nanda	edit ✓
Email Address	nandakamakshi30@gmail.com	edit ✓
Country	India	edit ✓
State	Gujarat	edit ✓
City	Vadodara	edit ✓
Pincode	390013	edit ✓
Phone Number	7202016793	edit ✓

Save

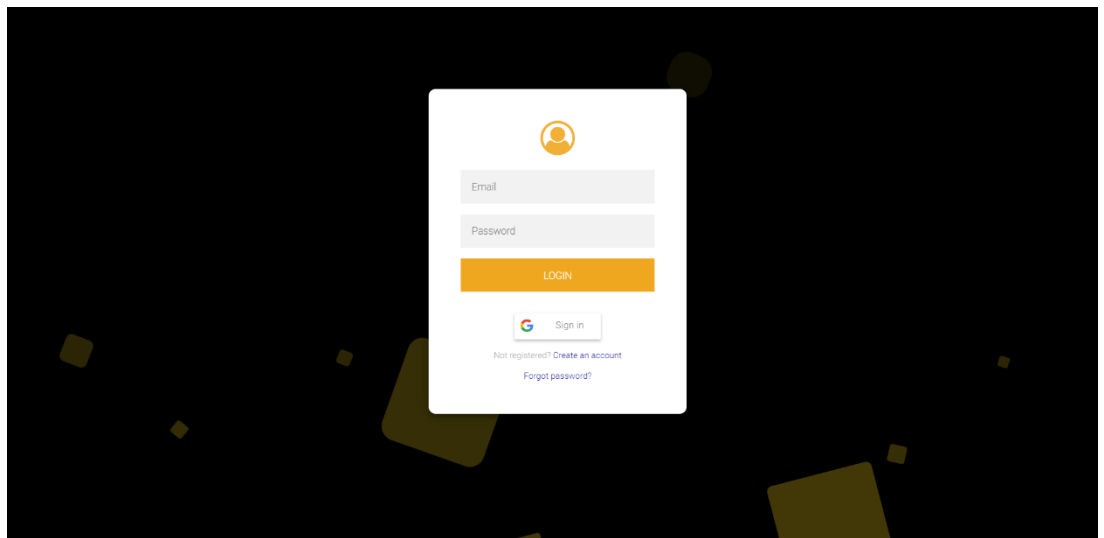
- User can view or edit his/her details on this page.

9. SignUp:

The screenshot shows a 'SIGN UP' form centered on a dark background. The form has a white background and contains the following fields: First Name, Last Name, Email Address, Password, and Confirm Password. Below these fields is an orange 'CREATE' button. At the bottom of the form, there is a link that says 'Already registered? Sign In'.

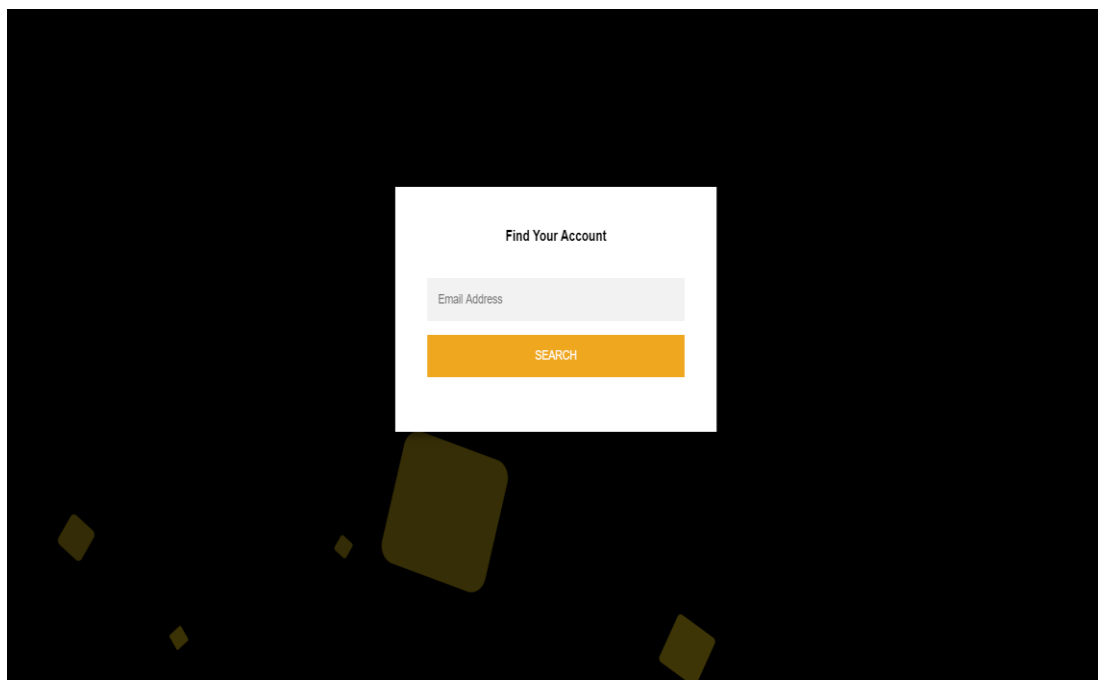
- User can register himself/herself into our application by creating an account using the above form.

10. Login:

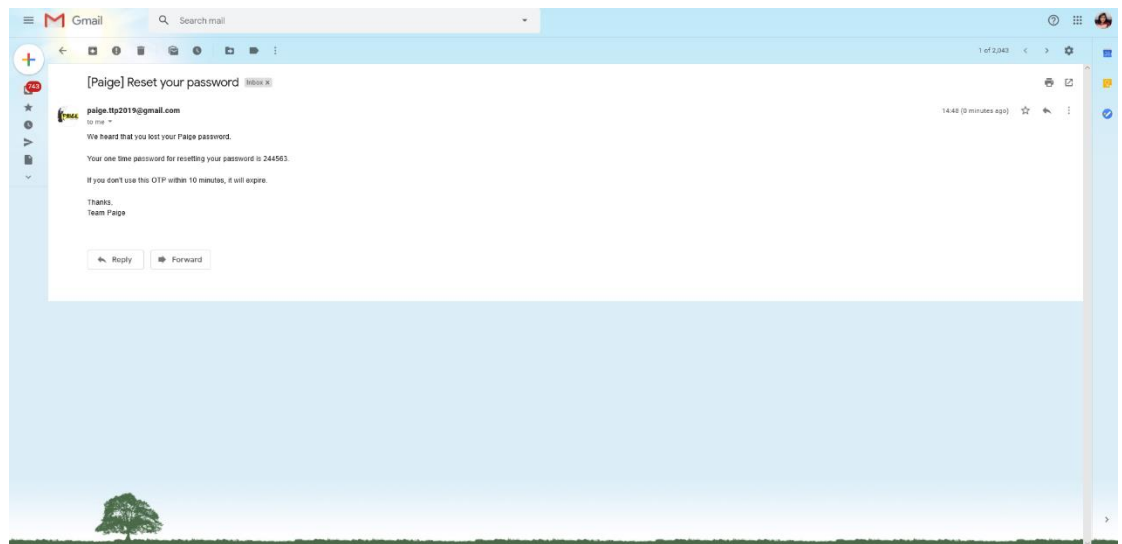
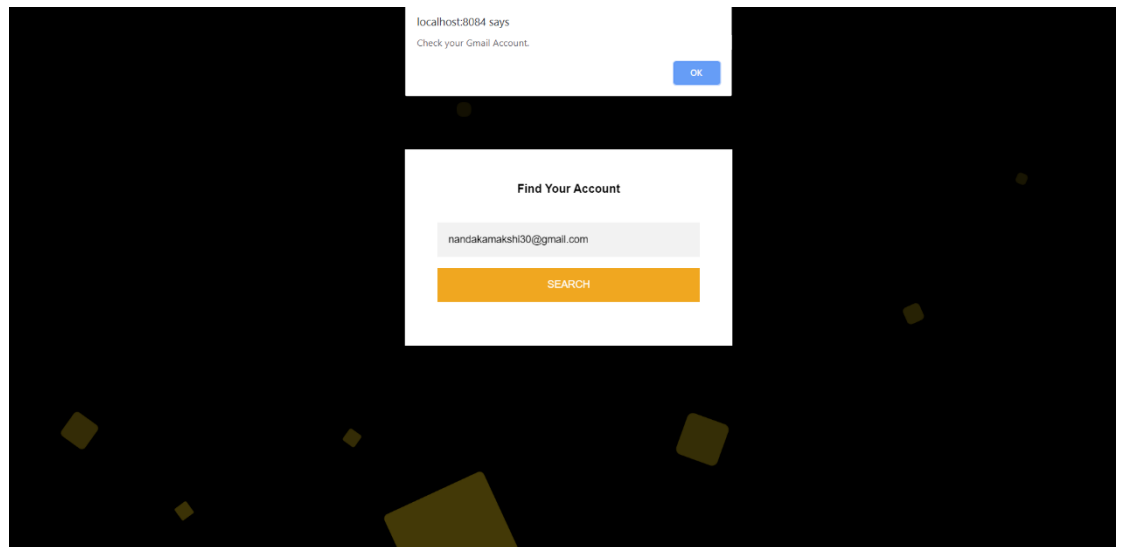


- User who has created an account in our web application can login through the above form.
- Or the user can also login through his/her Gmail account with the help of sign in with Google button.
- User can click on forgot password link if he/she has an account but has forgotten the password.

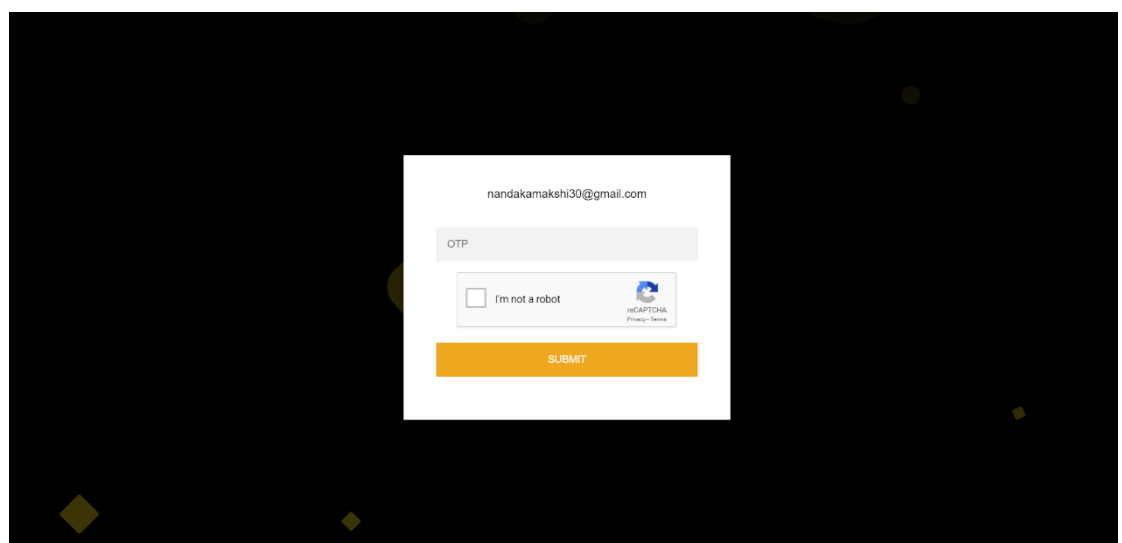
11. Forgot Password:



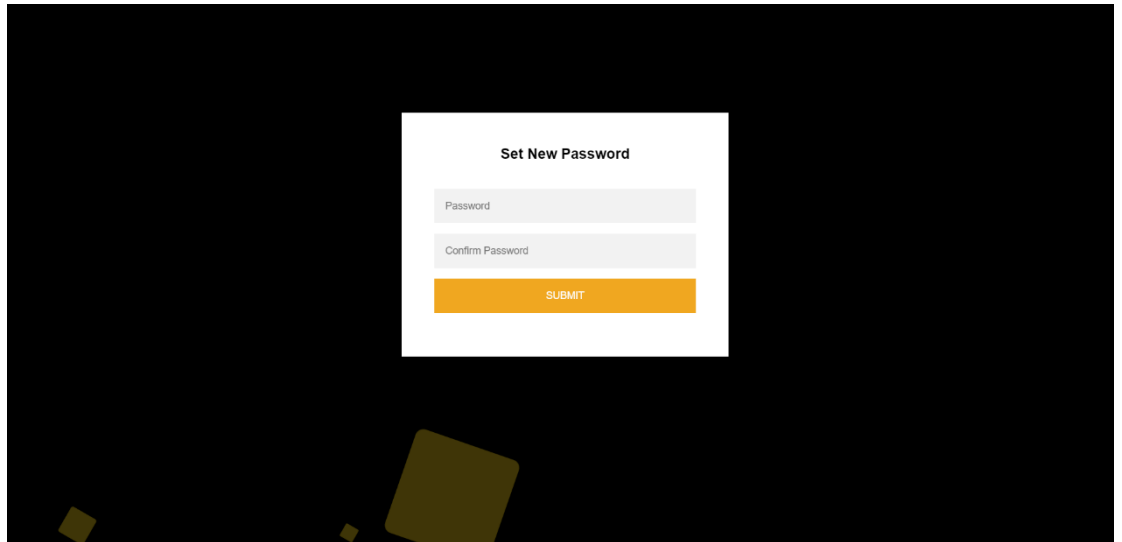
- User can find his/her account using the registered email address.



- An email containing the OTP is sent to their account if the email address is registered.

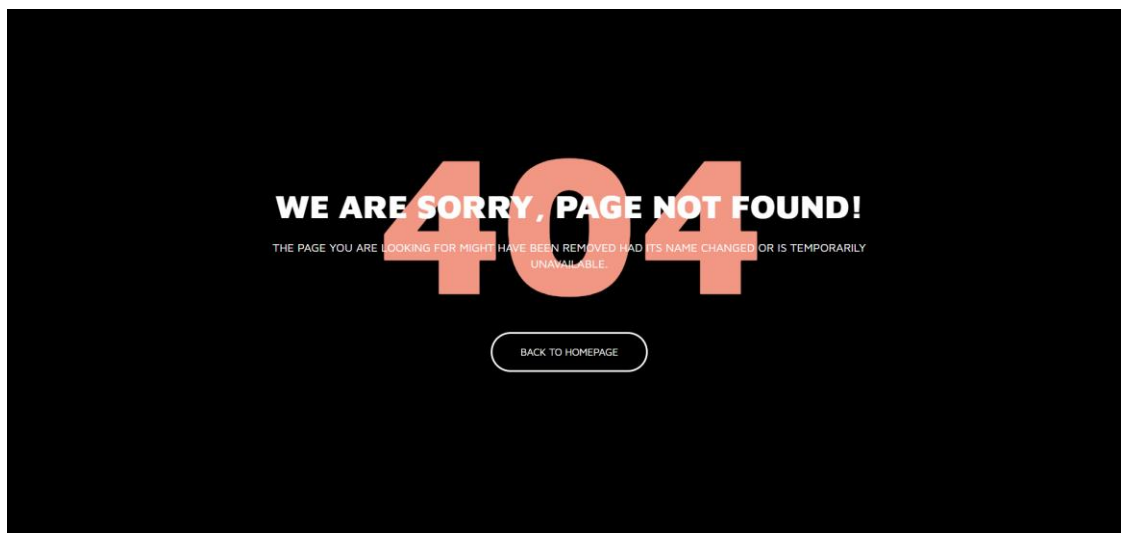


- User should enter the OTP sent to his/her email address on this page.

A screenshot of a 'Set New Password' form. The form is white and centered on a dark background. It contains two input fields: 'Password' and 'Confirm Password', both with light gray borders. Below these fields is an orange 'SUBMIT' button. The title 'Set New Password' is centered at the top of the form.

- Page to reset the password is provided if a right OTP is entered.

12. Error Page



- Used to prevent server information if a wrong URL is entered.

Testing

Software testing is the process used to identify the correctness, completeness, security and quality of developed computer software. With that in mind, testing can never completely establish the correctness of computer software.

1. Test Methods:

- a. Unit Testing
- b. Performance Testing
- c. System Testing

2. Test Plan:

a. Unit testing:

Test Scenario	Requirements	Test cases	Test data	Results
Check login functionality for user.	All correct combinations entered in login/password field.	Check response on entering valid input email and password.	Email- riddhi.batas@gmail.com Password-12345 Email- jayatigoswami1033@gmail.com Password-jayati	Login successful.
Check Search functionality.	All combinations of alphabets and numbers.	Check response on entering many different strings of input.	String-the String-t String-123	Got books with matched combination or got suggestions to improve the search result.
Upload a book for selling.	User should be logged in.	Tried accessing the page without logging in.	Tried accessing URL:- http://localhost:8084/Paige2/SellerForm.jsp without logging in.	Got redirected to home page.
Check filters on shop page.	All correct combinations of filters tried.	Tried applying different combinations of filters.	Language- English and Binding-paperback Category-Literature and Fiction and Condition-good	Got the appropriate sets of books.
Add books to cart.	Add all books to the cart.	Tried adding many different books and their combinations to the cart.	Clicked the button to add a book to cart for many books.	All the books were added to the cart successfully.

Edit profile.	User should be registered. Should update the details that are filled.	Registered user logged in.	Update details and save.	Details updated successfully.
Delete books.	User should be logged in. At least one or more than one books should be uploaded.	Try deleting different books.	Deleted many books.	Deletion successful.
Upload book details.	All the details should be inserted as per the requirements.	Try wrong inputs and leave input boxes empty.	Left input box for ISBN empty. Entered 12 digits in ISBN.	Prompt to correct or complete the input appeared.

b. Performance Testing

3. System is performing well – yes
4. Functions are dependent on each other – yes

a. System Testing

- Signed in user will be directed directly to the homepage- Yes
- Proper flow of Application – Yes
- Functionalities and modules are the same – yes

3. Bug Fixing/Test Report:

- During testing phase, we found some bugs in the coding. We had rectified the bugs and re-test the system and it passes the test with different test cases.

Security Features

1. prepared statement to avoid sql injection
2. error page to prevent the server information
3. hash algorithm SHA-256 algorithm used for encryption of sensitive data like password
4. java language for backend which provides many safety features itself
5. use of SSL protocol for hosting
6. use of recaptcha in many forms to avoid attacks like cross site request forgery attack
7. use of one time password (OTP) to authenticate the user

Coding standards Followed

- Indentation:

Proper and consistent indentation is important in producing easy to read and maintainable programs. Indentation used to:

 - Emphasize the body of a control statement such as a loop or a select statement
 - Emphasize the body of a conditional statement
 - Emphasize a new scope block
- Indentation used in a loop construct.
- Indentation used in the body of a method.
- Indentation used in a conditional statement.
- Inline Comments

Inline comments explaining the functioning of the subroutine or key aspects of the algorithm are used.
- comments.
- Structured Programming

Structured (or modular) programming techniques are used.
- Classes, Functions, and Methods

subroutines, functions, and methods are reasonably sized depending upon the language being used. The names of the classes, subroutines, functions, and methods have verbs in them.
- Source Files

The name of the source file or script represent its function. All of the routines in a file have a common purpose.
- Variable Names

Variable have meaningful names that convey to a casual observer, the intent of its use. Variables are initialized prior to its first use.
- Use of Braces

braces are used to delimit the bodies of conditional statements, control constructs, and blocks of scope.
- Compiler Warnings

Compiler warnings do not stop the compilation process. However, compiler errors do stop the compilation process, forcing the developer to fix the problem and recompile.
- Line Length
- Spacing

The proper use of spaces within a line of code to enhance readability.
- Wrapping Lines
 - Break after a comma
 - Break after an operator
 - Higher-level breaks to lower-level breaks

Limitations and Future Enhancements

I. Limitations:

- The system is limited to domestic users only.
- System doesn't provide any history details or summary of the books sold or rented to the users.
- System fails to detect the exact quality of books if the users upload edited pictures.

II. Future Enhancements:

- Artificial Intelligence: identify the original quality of book using AI.
- Make the system available to users globally.
- Provide a history pane

Experience and learning

Building a whole system from scratch considering all the aspects of software engineering from gathering requirements to planning, designing, proposing the project plan, defining the scope, modeling, analyzing the design, coding, building a database for a whole system, testing was a lifetime experience in itself.

Building a website for a client, working with database, server, interface design, backend coding, assembling everything to get the final output under the guidance of our client and the project guide taught us how different is the real world, working in team made us realize the importance of team spirit, unity and patience. We faced many difficulties but having a mentor/guide makes everything much more easier, every time we were stuck somewhere our guide was there to help us, challenged us to solve the queries on our own and in the end always used to give us the best solutions.

We learned to solve real problems, learned lot of new techniques and technologies during this period. This project helped us to get out of our comfort zone, learn new technologies and their implementations.

We also learned how to deal with a client. How to elicit requirements from the clients, stake holders and all the perspective users of the system. We learned to design and model the system. We learned to make various system diagrams such as behavioral diagrams, class diagrams, entity relationship diagrams. We learned and experienced how to present the prototypes. For the first time we created test cases for a system made by us and made others test the prototype.

These 4 months were a roller coaster ride for us consisting of knowledge gain, experience, life lessons, team work, real time dealing. We can't thank enough our client and the department for such an amazing experience.

References and Bibliography

- <https://www.olx.in> , <https://www.bookchor.com> – referred for the basic idea of the system
- <https://www.w3schools.com> –referred for bootstrap tutorials and interface designing
- <https://bootstrapious.com/tutorials>
- <https://www.uml-diagrams.org/sequence-diagrams.html> - for uml diagrams
- <https://www.smartdraw.com/uml-diagram/> - for uml diagrams
- <http://iti.ac.in/people/~tanimad/JavaTheCompleteReference.pdf>-JAVA complete reference seventh edition
- <https://openlibrary.org/dev/docs/api/books> - for fetching book details
- <https://isbndb.com/apidocs> - for fetching book details
- <https://cloud.google.com/kms/docs/encrypt-decrypt> - for cryptography
- <https://www.geeksforgeeks.org/generating-password-otp-java/> - for onetime password
- <https://stackoverflow.com/questions/16834661/what-step-and-process-involved-in-otp-sms-gateway-implementation> - for steps to generate and send otp
- https://www.google.com/search?q=recaptcha&rlz=1C1SQJL_enIN858IN858&oq=recaptcha&aqs=chrome..69i57j0l7.2446j0j7&sourceid=chrome&ie=UTF-8 – recaptcha implementation
- https://www.wolfssl.com/?gclid=Cj0KCQiArdLvBRCrARIsAGhB_syEdWSOGYUdIQZ-WxVmvhYTCMPxyvQkmlvY19gksVumCzVURVVN63kaAjwKEALw_wcB – for ssl implementation
- <https://www.geeksforgeeks.org/sha-1-hash-in-java/> - for hashing
- <https://howtodoinjava.com/security/how-to-generate-secure-password-hash-md5-sha-pbkdf2-bcrypt-examples/> - for hash algorithm for encryption
- <https://developers.google.com/web/fundamentals/security/encrypt-in-transit/enable-https>

THANK YOU