Library Reservation System – Business Analyst Case Study

Full Portfolio Documentation

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1. Business Case Study

Executive summary: This case study highlights the possible advantages of setting up an online platform for the library so that the library members can check out a book, reserve it, and also check out the new releases online, reducing wasted library visits when preferred books are unavailable.

Problem Statement: Reserving a book offline is time-consuming, and books are often out of stock. This frustrates members and may lead to cancellations. Searching for their favourite book, looking for new releases, is also a bit hard and upsets the book readers.

Option Analysis:

- **Option 1: Do nothing**
  Possible consequences - People will find this process time-consuming, especially students and employed people, and it can eventually make them visit the library less or switch to reading soft copies.

- **Option 2: Setting up Online Platform/App**
  Possible consequences - Setting up an online platform can allow members to easily search and filter books by author, release date, and genre. And also reserve them online and check which books are available or are out.

- **Option 3: Hire people for each task**
  Possible consequences - Hiring people for specific tasks, such as reserving books online, checking new releases, and determining book availability, allows library members to call and check availability. However, this approach increases costs and still requires manual effort.

Cost-Benefit Analysis:

- **Option A**
  Estimated Cost: “0”
  Ongoing Cost: Minimal
  Benefit: **No Benefit**, can lead to the same or a decline in business

- **Option B**
  Estimated Cost: Basic Website/App can cost from 50,000 - 1,00,000
  Ongoing Cost: Minimal

Benefit: Expected to reduce 40% of wasted library visits and improve member satisfaction.

- **Option C**
  Estimated Cost: 45,000 - 60,000 (If we hire 3 to 4 people)
  Ongoing Cost: “0”
  Benefit: Hiring more people to assist with the reservation of books, helping them with queries, and giving them updates about new releases and the availability of books can help library members have a smooth experience and increase their satisfaction rate

Recommendation:

Based on the cost-benefit analysis and stakeholder needs, we recommend
Option B: Implementing an Online Platform.

This Solution will:

- Reduce wasted library visits by 40-60%
- Improve member satisfaction and retention by 20%
- Provide scalability for future features such as notifications, reports, and mobile access

Next Steps

- Secure final budget approval from the Library Owner
- Engage the IT team to develop a prototype within 1 month
- Conduct User Acceptance Testing (UAT) with library members and staff
- Roll out the system in phases, starting with a pilot launch in Q4 2025

Implementation Plan:

- Timeline: 2 to 3 months
- Major activities/tasks: setting online platform, conducting tests with a group of members, gathering feedback, and making improvements before full launch.
- Responsible parties: Library owner, It Team, Library members, Library staff
- Resources needed: Budget- 50,000 - 1,00,000
  Tools- Good PC

- Dependencies: checking with library members what all things they would need on the online platform, getting their opinion

Risk Assessment:

Risk Description	Likelihood	Impact	Solution
Difficulty in operating the app/platform	Medium	Low	Getting constant feedback from the users and also providing assistance to them if they find it difficult to use the platform/app.
System bugs or performance issues	Medium to high	Low	Doing beta testing before launching the platform/app, to check if there are any bugs or if the site/app is slow, and fixing them immediately

Conclusion:

Option B: Setting an Online platform helps the library members to reserve the books easily, look for the books, check on new releases, and check the availability of the books, making their experience smooth and convenient, and lowering the chances of churning and also increasing the chances of making normal readers into library members. We recommend approval to proceed with detailed project planning starting Q4 2025.

We recommend proceeding with detailed project planning starting Q4 2025 to capture these benefits.

2. Stakeholder Analysis

Stakeholder Register

Stakeholder	Role	Internal/External	Power (1-5)	Interest (1-5)	Attitude	Requirement	Engagement Strategy
Library Owner	Sponsor/ Decision maker	Internal	5	5	Supportive	Cost control, ROI	Manage Closely
IT Team	Developers	Internal	4	3	Neutral	Maintainable system	Keep Satisfied
Librarian	Daily operator	Internal	3	5	Supportive	Simple UI	Keep Informed
Library Members	End-users	External	1	5	Supportive	Easy booking	Keep Informed

Power–Interest Grid

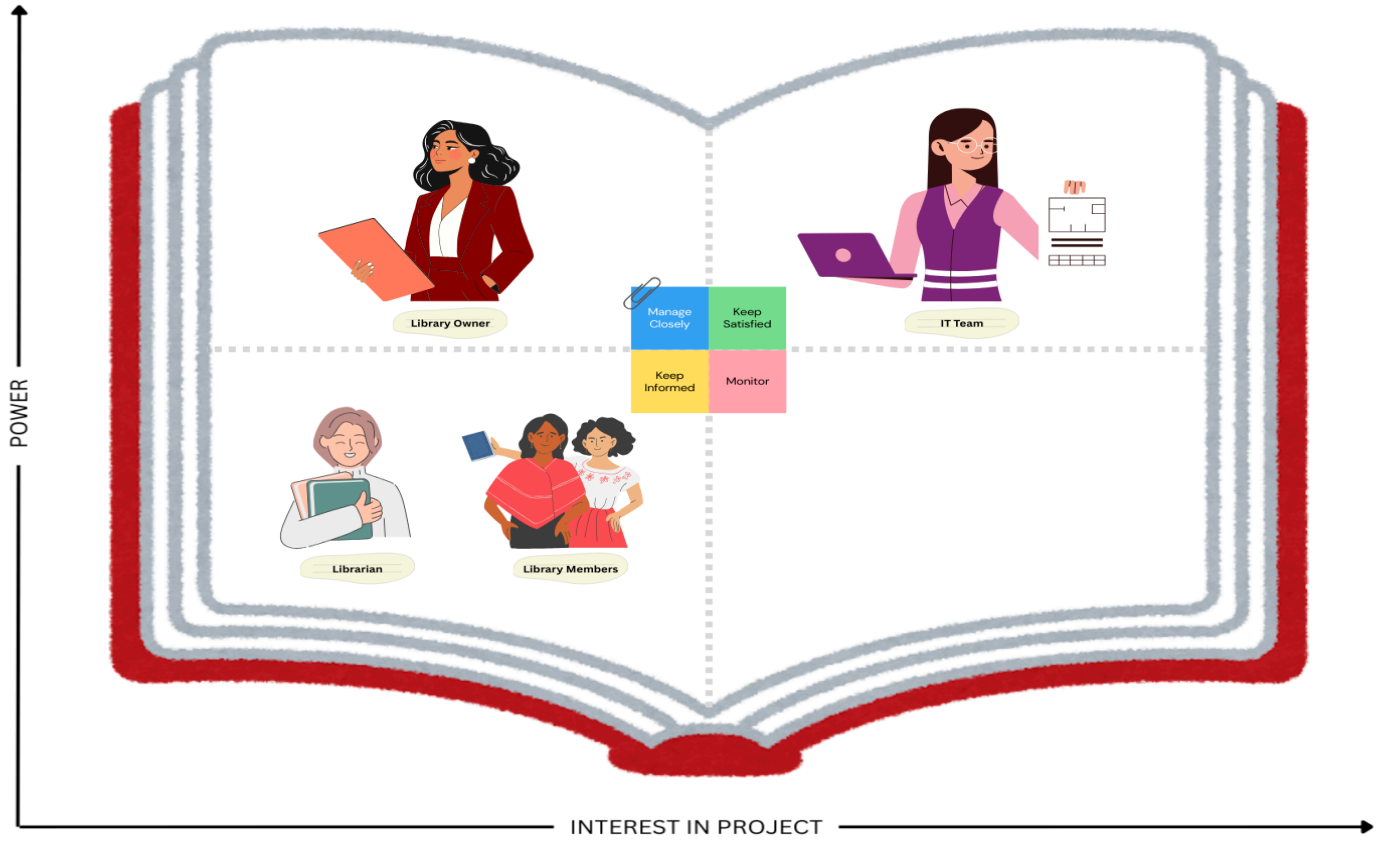

Figure 1: Power-Interest Grid

Stakeholder Requirement Gathering

Stakeholder	Role	Key Requirements	Elicitation Technique	Reason for Technique

Library Owner	Sponsor	ROI, cost control, reports	One-on-One Interview	Owner has high power; direct discussion captures vision + constraints
IT Team	Tech Support	Easy to maintain, secure system	Workshop / Technical Meeting	Collaborative session ensures feasibility + constraints
Librarian	Daily Operator	Simple UI, fast reservation flow	Observation + Interview	Observing current workflow + asking questions uncovers real pain points
Library Members	End-users	Easy booking, mobile access	Survey / Focus Group	Many users → quick survey + small group testing gives a variety of inputs

3. Business Requirement Document

Introduction

Objectives

To provide an online platform where members can check book availability and reserve titles, reducing unnecessary in-person visits and improving convenience.

Current & Proposed Process

As-is / To-be:

As-Is:

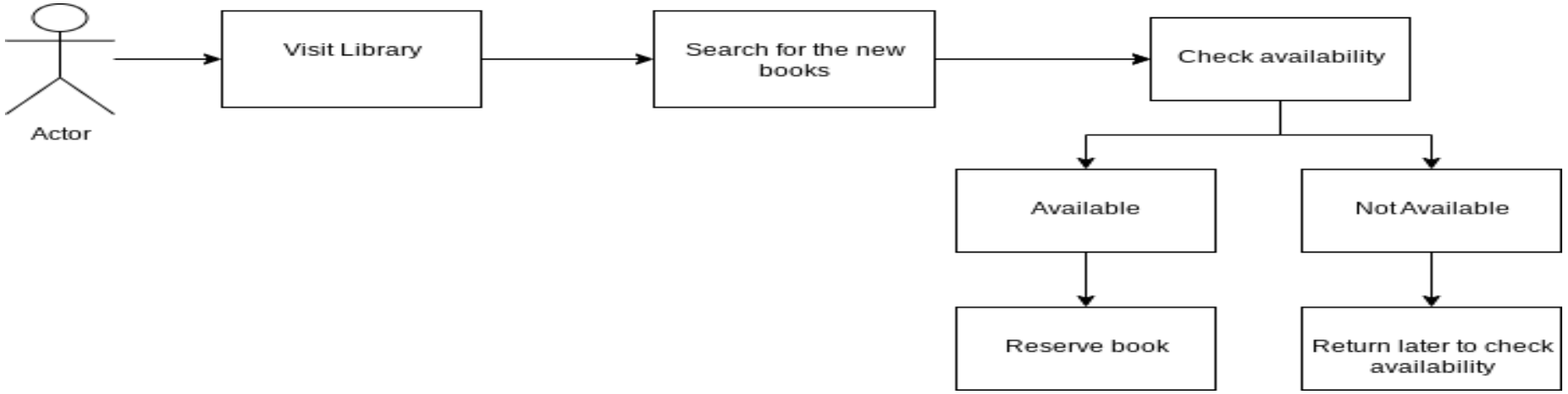

Figure 2: As-Is Process

Currently, library members must physically visit the library to look for new books. Members manually browse shelves and request staff to confirm availability.

Average time per search: 15-20 minutes.

- If the book is available, they can book/borrow it.
- If it is not available, members must return later to check again, which is inconvenient and time-consuming.

Key problems in As-Is:

- Manual and time-intensive process.
- No remote access (must be physically present).
- No real-time updates about availability.
- Frustrating when books are unavailable.

To-Be:

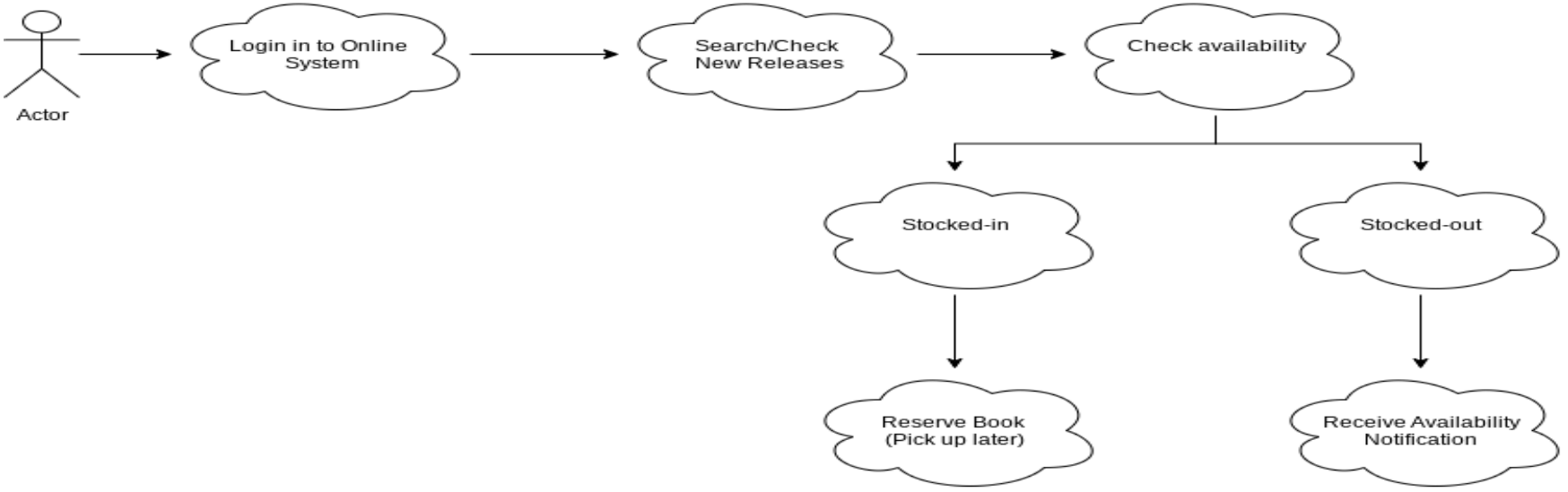

Figure 3: To-Be Process

In the proposed system, members will log in online via a platform/app, browse new releases, and check availability instantly.

- If the book is in stock, they can reserve it and later collect it from the library.
- If a book is out of stock, the system will automatically notify the member when it becomes available.

Expected to reduce wasted visits by 40-60%.

Key improvements in To-Be:

- Digital access (no need to visit the library physically to search).
- Faster, more convenient reservation process.
- Real-time stock visibility.
- Notifications reduce wasted effort.

Scope

In scope:

- Online book search
- Availability of books
- Book reservation feature
- Online reservation option
- Notification when reserved or out-of-stock books become available.

Out of scope:

- Home delivery
- Online payments
- Soft copy of books

Business Requirements

1. Members can search and filter books by author, release date, genre, and availability.
2. The interface must be simple and easy to navigate.
3. The system should allow the members to log in and check their profile, past purchases, and let them add books to their wishlist.
4. Members should reserve the books easily.
5. The system should notify members when the book is ready to be picked up, when books are stocked up, and when a new release is available.

Stakeholders

1. LIbrary Owner
2. Library Members
3. Librarians
4. IT Team

Assumptions

- Each member has internet access (Wi-Fi/mobile data) to use the system
- The library has data on its books stored online
- Members are digitally literate enough to use an online platform

Constraints

- Project timeline: 2months
- The budget is 50000

Approval Received

Name	Role	Signature	Date
Amelia	Library Owner	*amelia*	29/08/2025
Hailey	Librarian		
Kristen	IT Team		
Bella	Library Member		
Kendall	Library Member		

4. Workflows

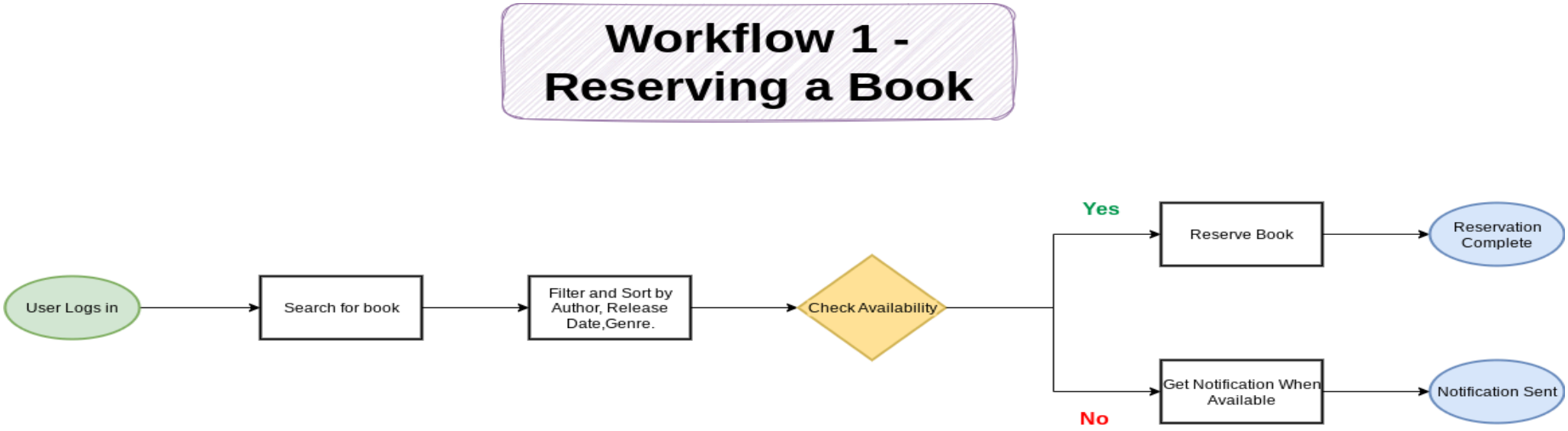

Figure 4: Workflow 1 - Reserving a Book

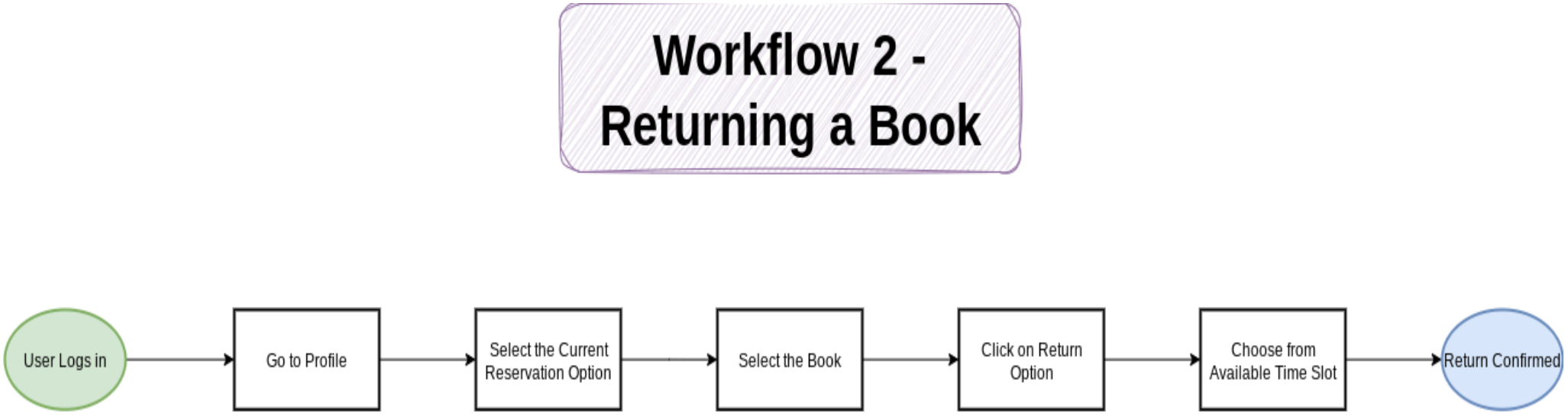

Figure 5: Workflow 2 - Returning a Book

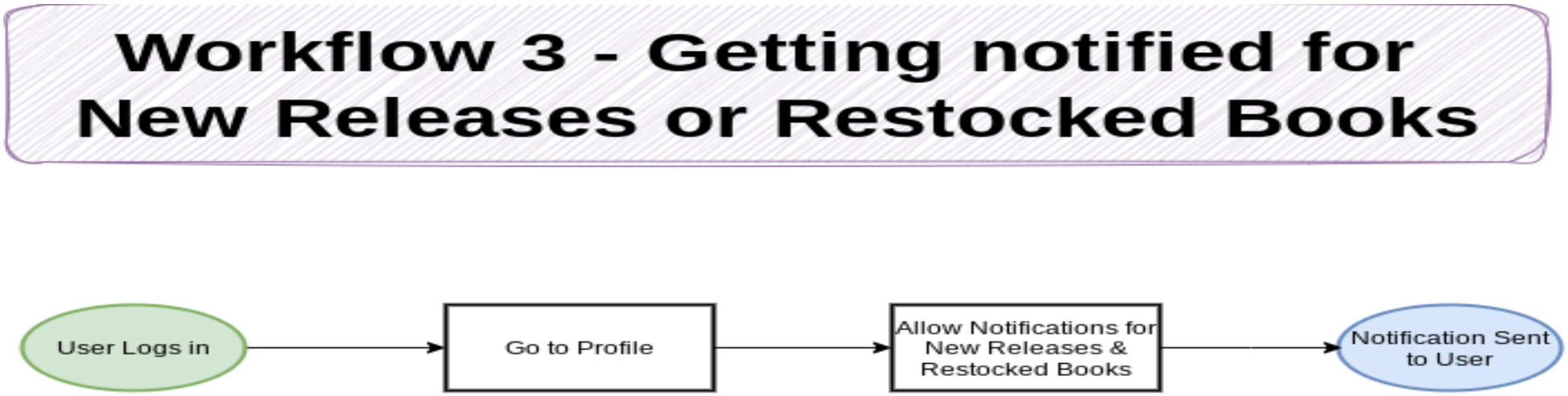

Figure 6: Workflow 3 - Getting notified for New Releases or Restocked Books

5. User Story & Acceptance Criteria

1. Library Owner - Online Reservation System

User Story:

As a Library owner
I want an online platform
So that members can check the status of books online and reserve them, thereby avoiding the hassle of visiting the library and searching for books.

Acceptance Criteria:

Given that I am a library member,

When I log in to the online platform,

Then I should be able to search for books by title, author, or category.

When a book is available,
Then I should see its status as "Available" and have the option to reserve it.

When a book is already reserved or checked out,
Then I should see its status as "Not Available" and be unable to reserve it.

2. Library Member – Book Reservation
User Story:
As a Library Member,
I want to search and reserve books online,
So that I save time and avoid unnecessary visits.

Acceptance Criteria:
Given I am logged in
When I search for a book
Then I should see results filtered by title, author, or genre.

Given that a book is available
When I click “Reserve,”
Then the system should confirm my reservation.

Given that a book is unavailable,
When I click “Reserve,”
Then the system should show “Not Available” and allow me to opt for notifications.

3. Library Member – Notifications

User Story:
As a Library Member,
I want to get notified when a book is restocked or a new release is available,
So that I don't miss out on books I'm interested in.

Acceptance Criteria:
Given I have enabled notifications,
When a reserved book becomes available,
Then I should get a notification.

Given that I have subscribed to new release alerts,
When a new book is added,
Then I should receive a notification.

4. Library Member – Reservation Management

User Story:
As a Library Member,
I want to view and cancel my reservations,
So that I can manage my borrowed books more effectively.

Acceptance Criteria:
Given I am logged in,
When I go to "My Reservations,"

Then I should see a list of my active reservations.

Given I have an active reservation,
When I click “Cancel,”
Then the reservation should be removed, and the book becomes available to others.

5. Librarian – Returns

User Story:
As a Librarian,
I want to track book returns,
So that the inventory is updated and books become available for other members.

Acceptance Criteria:
Given a member returns a book,
When I update the status,
Then the system should mark it as “Available.”

Given that a return is late,
When I update the return,
Then the system should log it as “Overdue.”

6. Use Case Diagram – Library Reservation System

The diagram below illustrates the primary interactions between actors (Library Member, Librarian) and the system. It covers core functions like searching, reserving, cancelling reservations, approving reservations, and managing inventory.

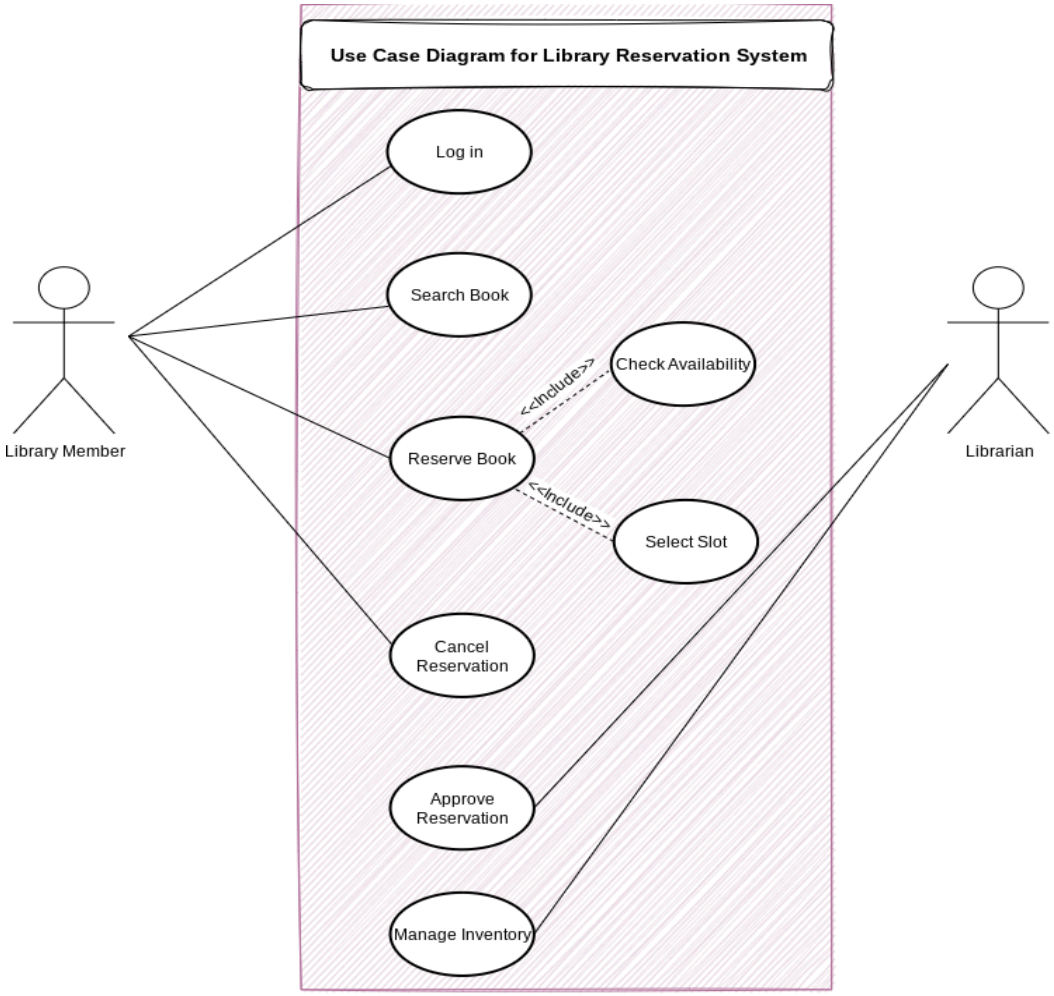

Figure 6: Use Case Diagram

- Library Members can: log in, search books, check availability, reserve books, and cancel reservations.
- Librarian can: approve reservations, manage inventory, and oversee the return process.

Use Case Description:

UC-01: Reserve a Book

Use Case ID: UC-01
Use Case Name: Reserve a Book
Actors: Library Member (Primary), System, Librarian (Secondary)
Preconditions:

- Member is logged into the system.
- The book exists in the catalog.

Trigger: Member selects 'Reserve Book' button for a chosen title.

Main Flow (Happy Path)

1. Member logs into the system.
2. Member searches for a book by title/author/genre.
3. System displays search results with availability status.
4. Member selects a book and clicks "Reserve Book."
5. System checks availability.
6. If available, the system confirms the reservation and updates inventory.
7. System sends a notification to the Librarian to prepare the book.
8. Member receives a confirmation with pickup details.

Alternate Flows

- **A1: Book Not Available**

    - System shows “Not Available” and offers to notify the member when restocked.
- **A2: Session Expired**
    - System redirects member to login page.

Postconditions:
- Reservation is recorded under the member’s profile.
- Librarian is notified.

This reduces manual reservations and ensures accurate tracking.

UC-02: Return a Book

Use Case ID: UC-02
Use Case Name: Return a Book
Actors: Library Member (Primary), Librarian (Secondary), System
Preconditions:
- Member has an active reservation.
- Book is not already marked as returned.

Trigger:
Member selects “Return Book” option in their profile.

Main Flow (Happy Path)
1. Member logs into the system.
2. Member goes to “My Reservations.”
3. Member selects a book and clicks “Return.”
4. System prompts member to choose an available return time slot.
5. Member selects a slot and confirms.
6. Librarian marks the book as returned once received.
7. System updates the book status to “Available.”

Alternate Flows

- A1: Book Already Overdue
    - System marks it as “Overdue” and notifies the Librarian for follow-up.
- A2: No Slots Available
    - System shows the next available time slot for return.

Postconditions:

- Book status updated to “Available.”
- Member’s account reflects updated return history.

7. System Architecture/ System Context Diagram

The diagram below illustrates the high-level architecture of the Library Online Reservation System. It shows how different actors (Library Members, Librarians) interact with the system, and how the system components (Web/Mobile App, Backend, Database, and Librarian Dashboards) connect to provide a seamless experience.

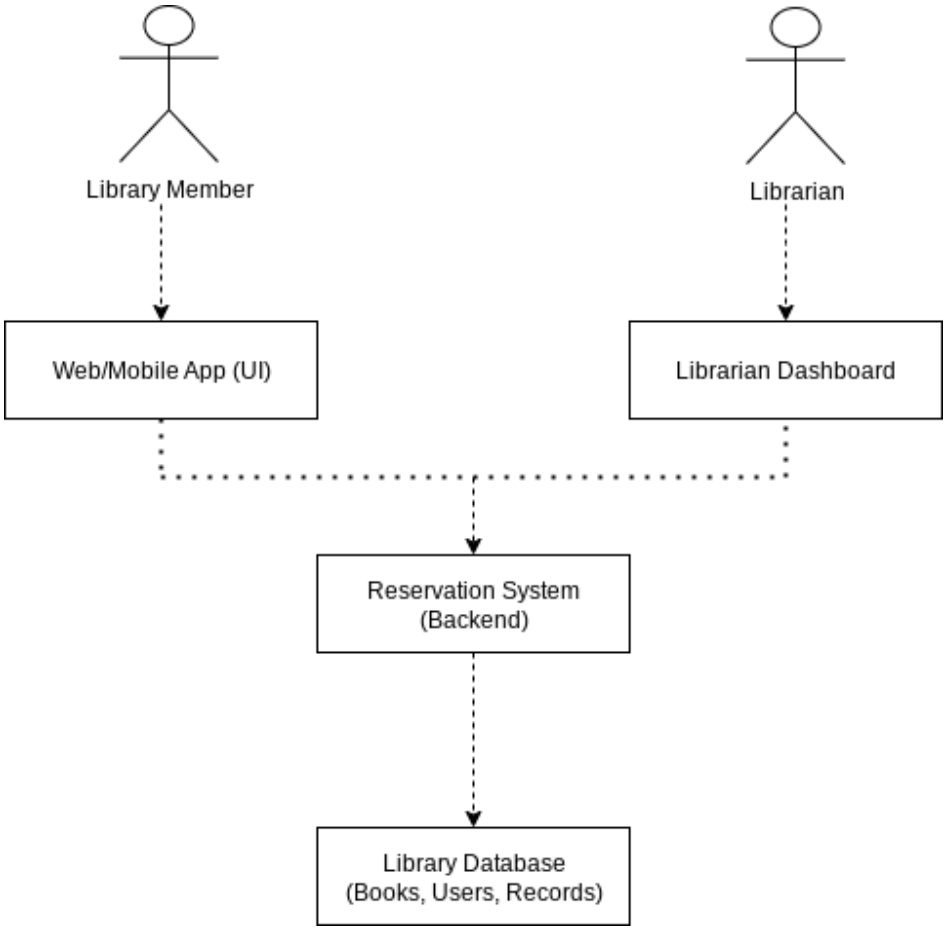

Figure 7: System Architecture Diagram

- Library Members access the system via the Web/Mobile App.
- The backend system manages book reservations, notifications, and user profiles.
- The Librarian Dashboard connects to the same backend and database to manage inventory and returns.

8. Wireframe

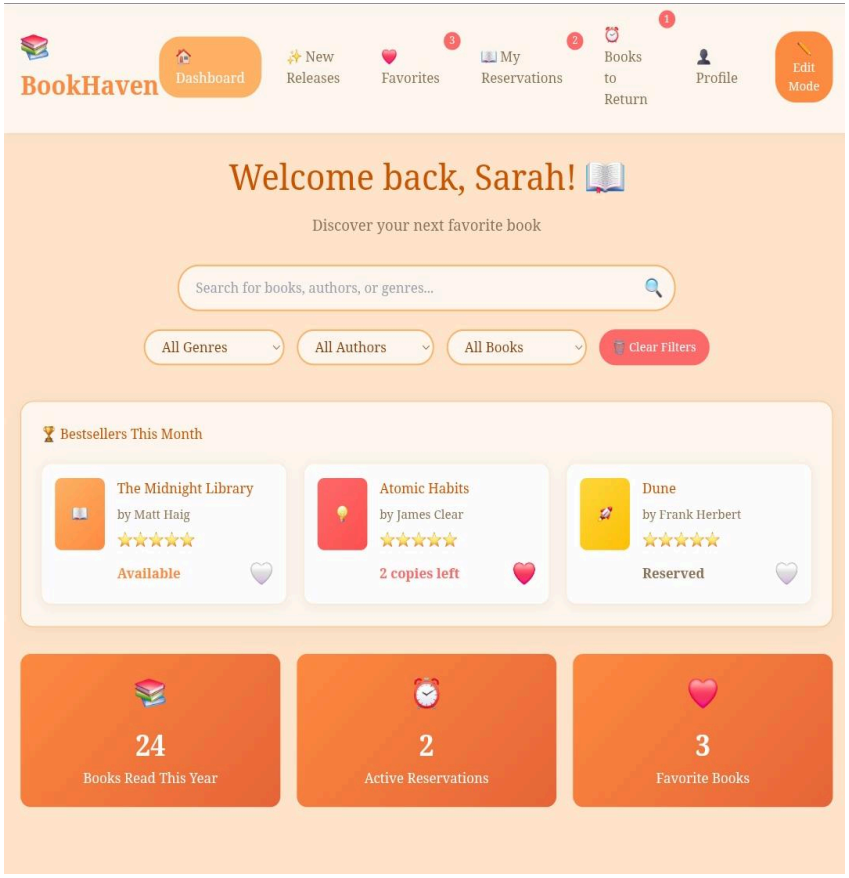

Figure 8: Wireframe 1 - Home Page

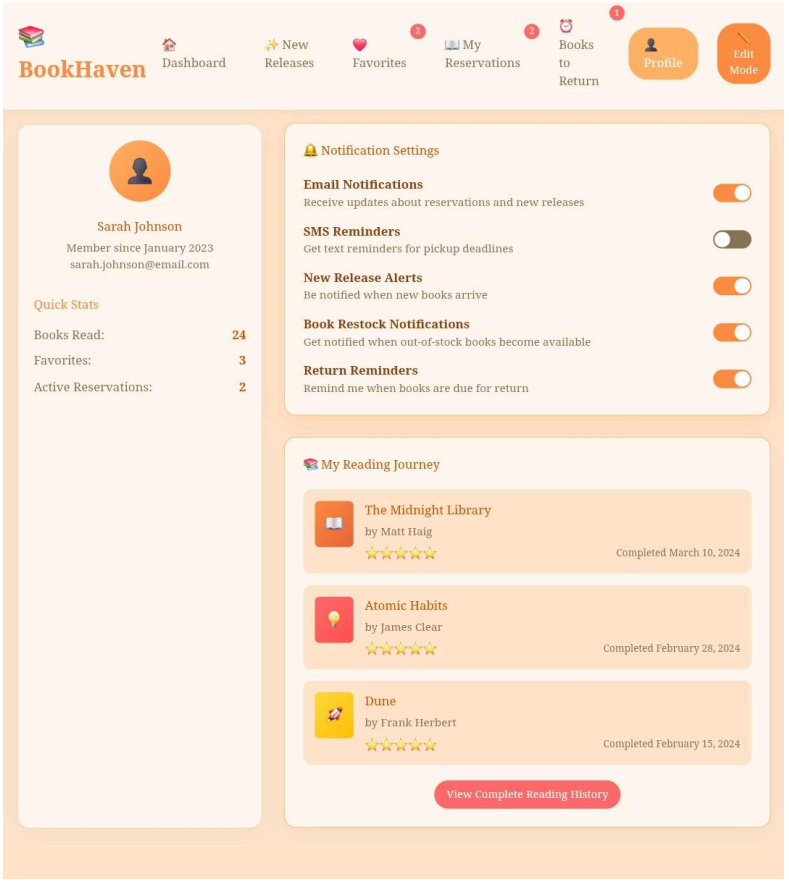

Figure 9: Wireframe 2 - Profile Page

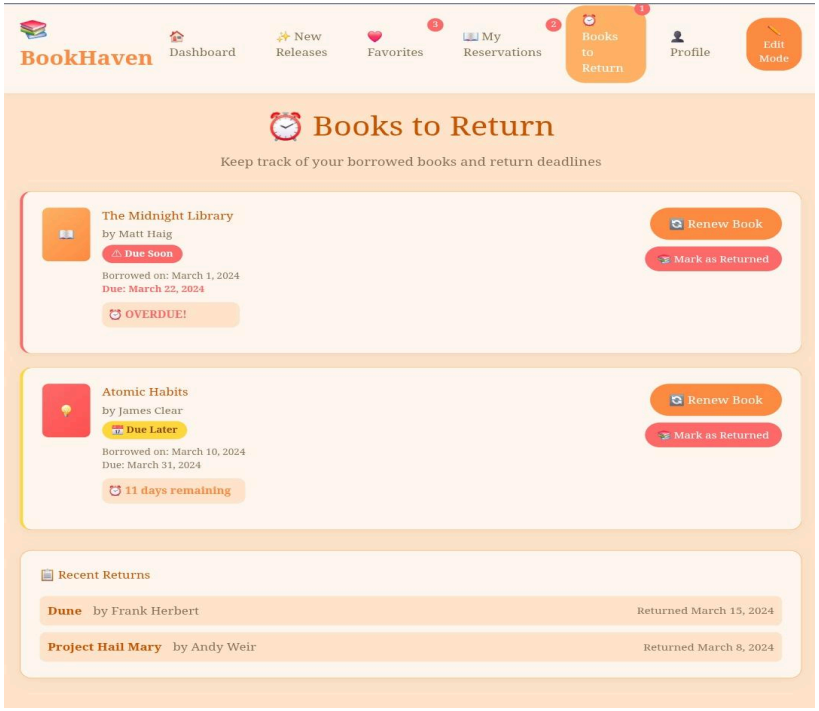

Figure 10: Wireframe 3 - Track Return

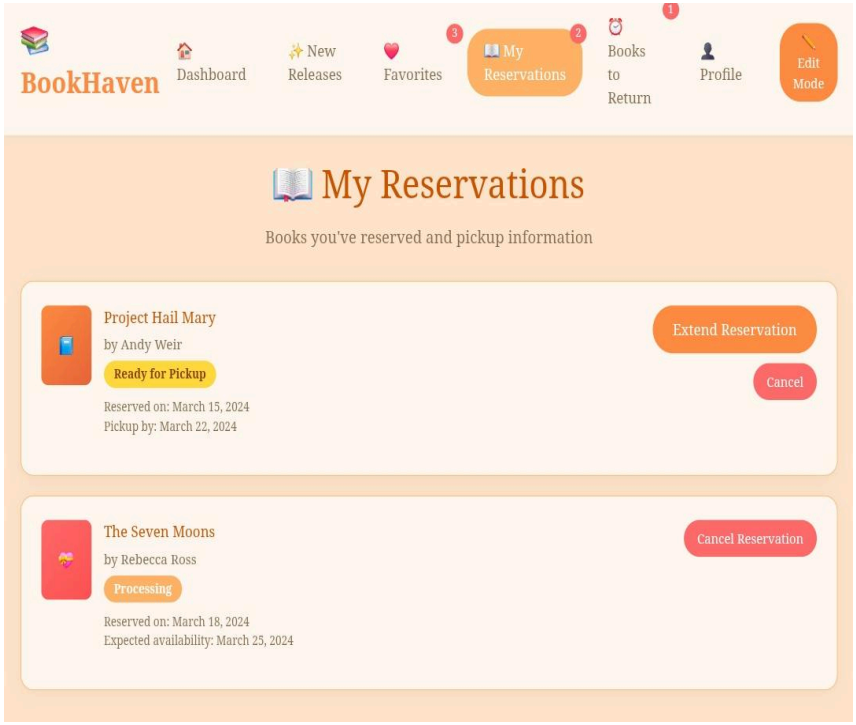

Figure 11: Wireframe 4 - My Reservations Page

9. Non-Functional Requirements - NFRs

NFR ID	Category	Requirement	Priority (High/Medium/Low)	Linked BR	Notes
NFR-01	Performance	The system should load search results within 3 seconds	High	BR-01	Smooth member experience
NFR-02	Usability	UI should be simple and easy to navigate	High	BR-02	Directly supports the librarian & members
NFR-03	Security	Only registered users can log in and reserve	High	BR-03, BR-04	Prevents unauthorized access
NFR-04	Availability	System should be available 24/7	Medium	BR-01, BR-04	Important for online access

NFR ID	Category	Requirement	Priority (High/Medium/Low)	Linked BR	Notes
		with 99% uptime			
NFR-05	Compatibility	System should work on desktop, tablet, and mobile	High	BR-01, BR-02, BR-04	Members often use phones

10 . Requirements Traceability Matrix - RTM

BR ID	Requirement	Functional Spec ID	Test Scenario ID	Test Case ID	Status
BR-01	Search books by author, release date, genre & availability	FR-01	TS-01 (Search books)	TC-01	Pass
BR-02	Simple & navigational UI	FR-02	TS-02 (Check UI usability/navigation)	TC-02	Pass
BR-03	Log in to their profile, have access to their past purchases, and let them add books to their wishlist	FR-03	TS-03 (Login success & failure)	TC-03	In Progress
BR-04	Easy to reserve the book	FR-04	TS-04 (Reserve book available/unavailable)	TC-04	Planned
BR-05	Notifications get released when the book is ready to get picked, stocked up, and on new releases.	FR-05	TS-05 (Check notifications)	TC-05	Planned

11. Test Scenarios

Test Scenario ID	Scenario Description	Preconditions	Expected Result	Status
TS-01	Search books by author, release date, genre, and availability	Member logged in	Correct search results displayed	Pass
TS-02	Check UI usability/navigation	The system is running	User can navigate easily without confusion	Pass
TS-03	Log in with a valid & invalid credentials	Account exists	Valid → Dashboard opens; Invalid → Error message	In Progress
TS-04	Reserve book (available & unavailable cases)	Book exists	Available → Reservation confirmed; Unavailable → “Not Available” shown	Planned
TS-05	Notifications for book ready, stocked, new releases	Book status changes	Member receives notification	Planned

12 . Conclusion

The Library Reservation System project demonstrates how business analysis practices can identify inefficiencies in existing manual processes and design digital solutions that address stakeholder needs. By conducting stakeholder analysis, requirement gathering, and process mapping, the project identified key pain points faced by library members and staff, including wasted visits, a lack of real-time book availability, and low user satisfaction.

The proposed online reservation platform offers tangible benefits:

- Reduces wasted library visits by 40–60%
- Improves member satisfaction and retention by 20%
- Provides scalability for future enhancements such as notifications, reports, and mobile access

This project applied multiple BA tools and techniques, including:

- Requirement Gathering Techniques (interviews, surveys, observation, workshops)
- Business Requirement Document (BRD) with scope, assumptions, and constraints
- User Stories, Acceptance Criteria, Use Case Diagrams, Wireframes
- Requirements Traceability Matrix (RTM) and Test Scenarios

Overall, the case study reflects how a Business Analyst bridges the gap between business needs and technical solutions. It demonstrates my ability to document, analyze, and communicate requirements effectively, while ensuring solutions are practical, cost-effective, and user-centric.