

1. INTRODUCTION

1.1 Project Overview

Booknest is a full-stack web application developed using the MERN stack—MongoDB, Express.js, React.js, and Node.js—that serves as a modern online bookstore platform. The goal of this project is to allow users to browse, wishlist, and purchase books from anywhere and enable administrators to manage books, users, and orders efficiently via an admin dashboard.

Built as a solo development initiative, Booknest demonstrates complete ownership over the software development lifecycle, including system architecture, frontend development, backend APIs, database modeling, and deployment readiness.

The application offers a seamless experience for both general users (readers/customers) and admin users (store managers). Features like book cover uploads, category filtering, secure login with JWT, and role-based access control ensure the platform is feature-rich and production-ready.

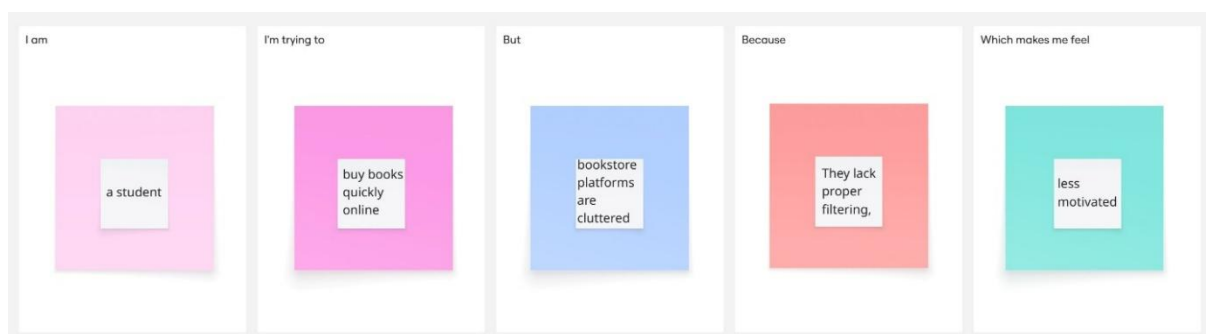
1.2 Purpose

The purpose of Booknest is to provide a simple, efficient, and user-friendly online bookstore platform where users can browse, wishlist, and order books, while administrators manage inventory and users through a secure dashboard.

It solves the need for convenient book access by eliminating the constraints of physical shopping and offering a structured digital alternative. Additionally, it showcases full-stack development skills using the MERN stack, covering frontend, backend, authentication, and database integration in a single cohesive application.

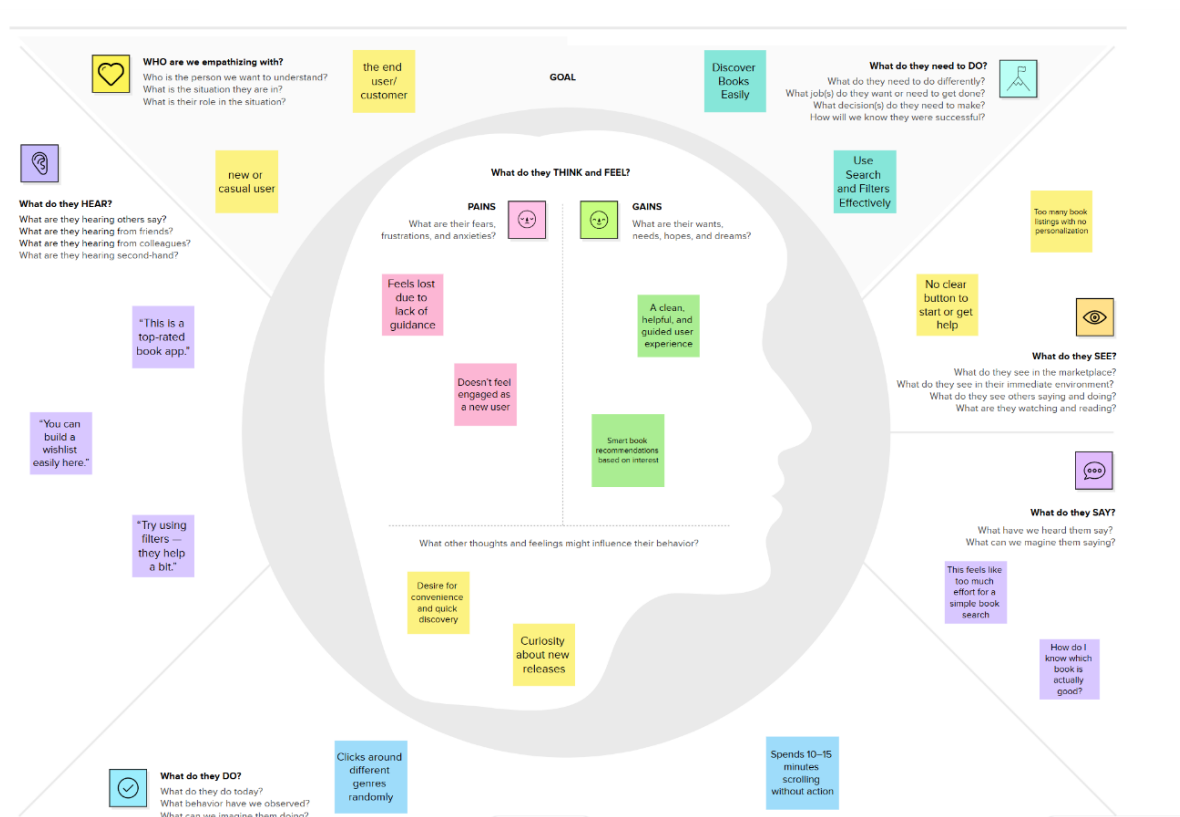
2. IDEATION PHASE

2.1 Problem Statement



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A busy student who loves reading	Find and buy books quickly online	Most bookstore platforms are cluttered and time-consuming	They lack proper filtering, personalization, and smooth UX	Frustrated and overwhelmed
PS-2	An admin managing book inventory	Keep the online store updated with books, prices, and orders	Manual updates take time and often cause errors	There's no efficient dashboard or automation	Drained and less motivated to maintain the site

2.2 Empathy Map Canvas



2.3 Brainstorming (Sticky Note Ideas)

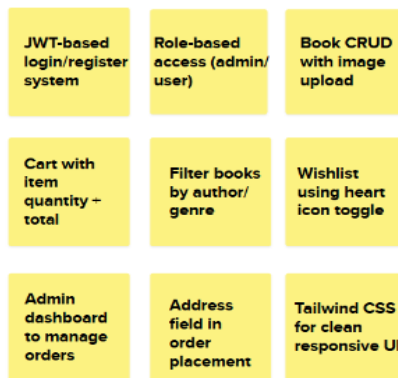
2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

PAVANI



3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

Scenario: [Existing experience through a product or service]	Enter How easy/difficult is it to use the product?	Engage How easy/difficult is it to use the product?	Exit What is the exit process like?	Extend What is the exit process like?
Experience steps What does the process look like at the moment of use? (Typically, experience is based on steps)	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management
Interactions What are the key interactions at each step? (Typically, interactions are based on steps)	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management
Goals & motivations What are the goals and motivations of the user? (Typically, goals and motivations are based on steps)	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management
Positive moments What are the positive moments of the user? (Typically, positive moments are based on steps)	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management
Negative moments What are the negative moments of the user? (Typically, negative moments are based on steps)	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management
Areas of opportunity What are the areas of opportunity for the user? (Typically, areas of opportunity are based on steps)	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management	1. User registration 2. User login 3. User profile management

3.2 Solution Requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	<ul style="list-style-type: none">• Registration through Form• Registration through Gmail
FR-2	User Confirmation	<ul style="list-style-type: none">• Confirmation via Email
FR-3	Book Browsing & Wishlist	<ul style="list-style-type: none">• Browse books by genre/author• Add/Remove from wishlist
FR-4	Cart & Order Management	<ul style="list-style-type: none">• Add to cart• Place order with delivery address
FR-5	Admin Panel	<ul style="list-style-type: none">• Manage books• Manage users• Update order status
FR-6	Profile Management	<ul style="list-style-type: none">• Update name/email/password
FR-7	Book Image Upload	<ul style="list-style-type: none">• Upload book front cover while adding/editing books

Non-functional Requirements:

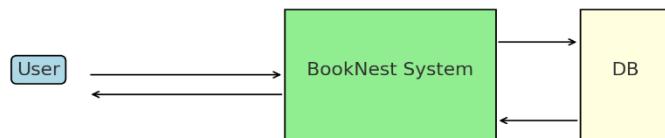
Following are the non-functional requirements of the proposed solution.

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	User-friendly UI with simple navigation and responsive design
NFR-2	Security	JWT authentication, role-based access, and secure password handling
NFR-3	Reliability	Consistent functionality under different user loads and inputs
NFR-4	Performance	Fast response times for browsing, filtering, and dashboard loading
NFR-5	Availability	24/7 uptime with cloud-hosted backend
NFR-6	Scalability	Modular architecture to support future user growth and additional features

3.3 Data Flow Diagram

Level-0 Data Flow Diagram-Context Level:

DFD Level-0 – BookNest



- User sends request (register, login, browse books, order, wishlist).
- System responds with book list, dashboard, confirmation
- System stores/updates data in MongoDB

Level 1 DFD – Functional Decomposition

DFD Level-1 – BookNest



Data flows:

- From user to system through login, book filters, wishlist, and cart interactions
- System reads/writes to MongoDB (user, book, order, wishlist collections)

3.4 Technology Stack

Component	Description	Technology Used
Frontend (UI)	Web interface for users	React.js, Tailwind CSS
Backend (API Logic)	Business logic, routing	Node.js, Express.js
Database	Data storage	MongoDB, MongoDB Atlas
Authentication	Login and token management	JWT, Bcrypt.js
File Upload	Book images	Multer, Cloudinary (optional)
Hosting	Frontend and Backend hosting	Vercel (Frontend), Render or Railway (Backend)

4. PROJECT DESIGN

4.1 Problem Solution Fit

Problem-Solution fit canvas 2.0

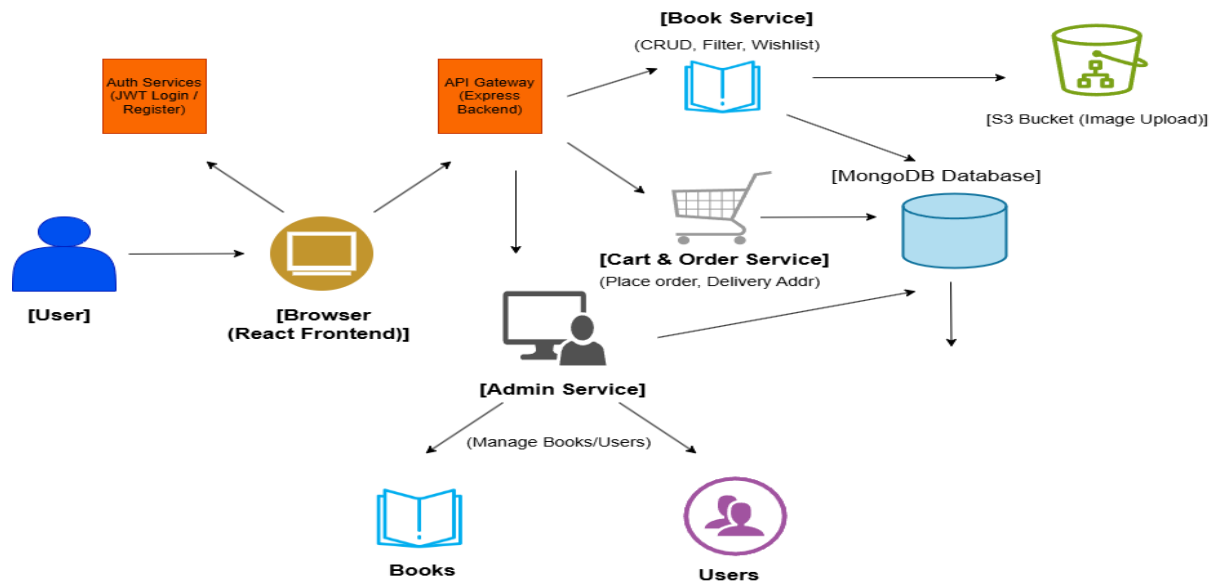
Purpose / Vision

Define CS, fit into	1. CUSTOMER SEGMENT(S) CS Who is your customer? <ul style="list-style-type: none"> Busy students, working professionals, and casual readers who prefer online access to books. Admins or bookstore owners managing inventory and customer orders digitally. 	6. CUSTOMER CC What constraints prevent your customers from taking action or limit their choices of solutions? <ul style="list-style-type: none"> Limited budget or time to explore options. Low digital literacy (for some users). No account created — fear of data misuse. 	5. AVAILABLE SOLUTIONS AS Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? <ul style="list-style-type: none"> Amazon, Flipkart, physical bookstores. Pros: Trusted brands, wide range. Cons: Overwhelming UX, not tailored for book-lovers, lacks wishlist or admin control. 	Explore A.S.
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides. <ul style="list-style-type: none"> Users want to browse and buy books online easily. Users want to save books for later (wishlist). Admins need to manage books, users, and orders efficiently. 	9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? <ul style="list-style-type: none"> Digital platforms prioritize transactions over user experience. Admins lack dedicated dashboards tailored for bookstore operations. Readers have too many choices, but lack direction. 	7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace) <ul style="list-style-type: none"> Use online platforms (Amazon) to search titles. Visit bookstores for personalized help. Ask friends for recommendations. 	Focus on J&P, tap into BE, understand
Identify strong TR & EM	3. TRIGGERS TR What triggers customers to act? <ul style="list-style-type: none"> Need to buy a book urgently (for study, interest, gifting). Seeing friends or peers using online book platforms. 	10. YOUR SOLUTION SL <ul style="list-style-type: none"> A clean, responsive MERN-based bookstore app. Features: Secure login, wishlist, filters, cart, order with address, admin panel. Easy for users to browse and buy; powerful tools for admins to manage everything. 	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 1. Google/book searches 2. Adding to cart or wishlist 3. Browsing genres/filter 4. Order placement & reviews 8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. <ul style="list-style-type: none"> Visiting bookstores Discussing with peers 	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER EM How do customers feel when they face a problem or a job and afterwards? <ul style="list-style-type: none"> Before: Confused, overwhelmed, frustrated, unmotivated, skeptical. After: Empowered, satisfied, in control, more engaged with reading. 			

4.2 Proposed Solution

S.No.	Parameter	Description
1	Problem Statement	In today's busy lifestyle, book lovers often struggle to find time to visit physical stores. Moreover, local availability and selection are often limited. There is a need for a centralized online platform to browse, wishlist, and purchase books conveniently, with the ability for admins to manage inventory efficiently.
2	Idea / Solution Description	Booknest is a full-stack MERN web application that serves as an online bookstore. It allows users to register/login, browse/filter books by genre or author, add to wishlist/cart, and place orders. Admins can upload books, manage inventory, and track orders through a secured dashboard. The system is role-based, responsive, and scalable.
3	Novelty / Uniqueness	Unlike static book listings or basic e-commerce demos, Booknest includes features like image upload, dynamic wishlist toggling, admin-controlled order status updates, and JWT-based secure role access. It simulates real-world functionality typically found in large e-commerce platforms but built fully as a solo MERN stack project.
4	Social Impact / Customer Satisfaction	The solution empowers readers with easier access to diverse book collections and allows book sellers/admins to manage inventory digitally. It supports learning, literacy, and digital convenience—especially helpful for students, working professionals, and rural readers.
5	Business Model (Revenue Model)	Booknest can adopt a commission-based model for authors/vendors, ad monetization, or subscription-based premium access (e.g., early releases, personalized recommendations). Affiliate partnerships with publishers can also be considered.
6	Scalability of the Solution	Built with a modular, RESTful, and stateless architecture using the MERN stack, Booknest is fully scalable. It can be extended to support multi-vendor management, mobile apps, payment integration, analytics, and even cloud-native deployment using services like Vercel, Render, or AWS.

4.3 Solution Architecture



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register using email, password, and confirmation password.	2	High	Yoga srivalli
Sprint-1		USN-2	As a user, I will receive a confirmation email after registering.	1	High	Yoga srivalli
Sprint-1		USN-3	As a user, I can register using Gmail authentication.	2	Medium	Yoga srivalli
Sprint-1	Login	USN-4	As a user, I can log in using email and password.	1	High	Yoga srivalli
Sprint-2	Dashboard	USN-5	As a user, I can view a personalized dashboard with my books and orders.	3	High	Yoga srivalli
Sprint-2	Book Browsing	USN-6	As a user, I can browse books and filter by genre and author.	3	High	Yoga srivalli
Sprint-2	Wishlist	USN-7	As a user, I can add or remove books from my wishlist using a heart icon.	2	Medium	Yoga srivalli
Sprint-3	Cart & Order	USN-8	As a user, I can add books to cart and place an order with address.	4	High	Yoga srivalli
Sprint-3	Profile Management	USN-9	As a user, I can edit my profile details (name, email, password).	2	Medium	Yoga srivalli
Sprint-4	Admin Dashboard	USN-10	As an admin, I can manage all books, users, and orders from a single panel.	5	High	Yoga srivalli
Sprint-4	Admin Order Update	USN-12	As an admin, I can update order statuses (Processing, Shipped, Delivered).	3	Medium	Yoga srivalli
Sprint-4	Book Image Upload	USN-13	As an admin, I can upload book front cover images when adding books.	2	Medium	Yoga srivalli

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	6	6 Days	01 Jun 2025	06 Jun 2025	6	06 Jun 2025
Sprint-2	8	6 Days	07 Jun 2025	12 Jun 2025	8	12 Jun 2025
Sprint-3	6	6 Days	13 Jun 2025	18 Jun 2025	6	18 Jun 2025
Sprint-4	10	6 Days	19 Jun 2025	24 Jun 2025	10	24 Jun 2025

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

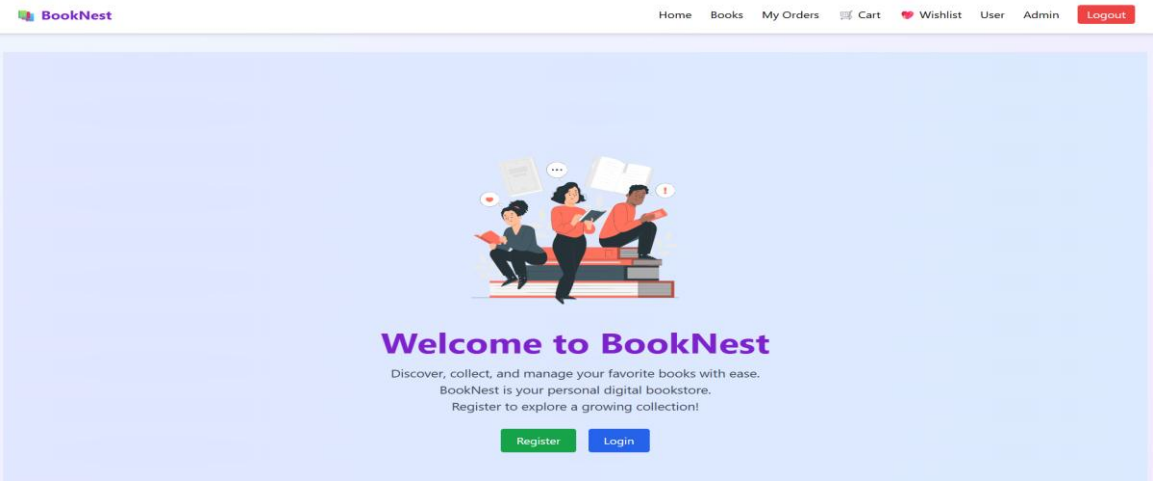
Performance testing is essential to evaluate how the BookNest application behaves under expected workloads. Although BookNest is primarily tested manually during development, key performance metrics were observed to ensure smooth user experience and backend responsiveness.

Goals of Performance Testing

- Ensure fast page load times and API response times
- Validate server handling capacity for multiple concurrent requests
- Identify and resolve performance bottlenecks
- Maintain responsiveness during user actions such as login, wishlist toggle, cart operations, and order placement

7. RESULTS

Home Page:



Login Page:

localhost:5173/login

BookNest

Home Books My Orders Cart Wishlist User Admin Logout

Login

Email

Password

Login

Registration Page:

localhost:5173/register

BookNest

Home Books My Orders Cart Wishlist User Admin Logout

Register

Name

Email

Password

Register


Books Page:

BookNest

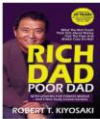
Home Books My Orders Cart Wishlist User Admin Logout

Available Books

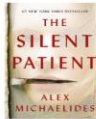
All Genres All Authors Reset Filters




The Little Prince
A cosmic journey revealing life's unseen truths through a child's eyes.
Author: Antoine de Saint-Exupéry
Genre: Fantasy, Children's Fiction, Philosophical Allegory
Price: ₹599
[Add to Cart](#)




Rich Dad Poor Dad
"Rich Dad Poor Dad" contrasts the financial philosophies of two fathers to underscore the importance of financial literacy, teaching readers to acquire income-generating assets rather than liabilities to achieve wealth.
Author: Robert Kiyosaki (with Sharon Lechter)
Genre: Personal Finance, Non-Fiction, Self-Help, Business, Investment
Price: ₹399
[Add to Cart](#)




The Silent Patient
A psychological thriller where a woman's act of violence against her husband and her refusal to speak leads to a gripping mystery.
Author: Alex Michaelides
Genre: Thriller
Price: ₹399
[Add to Cart](#)



Atomic Habits



The Alchemist



Stephen Hawking

Your Orders Page:

BookNest

HomeBooksMy OrdersCartWishlistUserAdminLogout

Your Orders


Order ID: 685b0ab6a66514c63665d5c1

Status: Shipped

Total Amount: ₹399

Ordered on: 25/6/2025, 1:59:42 am

Address: Rajendra Nagar, Gudivada, Andhra Pradesh, India.



Rich Dad Poor Dad

Author: Robert Kiyosaki (with Sharon Lechter)

Price: ₹399

Quantity: 1

Admin Dashboard:

BookNest

HomeBooksMy OrdersCartWishlistUserAdminLogout

Admin Dashboard

Total Users
3

Total Books
10

Total Orders
1

Admin Viewing all the Users:

BookNest

HomeBooksMy OrdersCartWishlistUserAdminLogout

All Users

Name	Email	Role	Created
Leelu	leelu@example.com	user	20/6/2025
Admin	admin@example.com	admin	21/6/2025
abc	abc@gmail.com	user	22/6/2025

Admin can perform CRUD operations on books:

BookNest


HomeBooksMy OrdersCartWishlistUserAdminLogout

Manage Books

+ Add Book

Title	Author	Genre	Price	Actions
The Little Prince	Antoine de Saint-Exupéry	Fantasy, Children's Fiction, Philosophical Allegory	₹599	<div>EditDelete</div>
Rich Dad Poor Dad	Robert Kiyosaki (with Sharon Lechter)	Personal Finance, Non-Fiction, Self-Help, Business, Investment	₹399	<div>EditDelete</div>
The Silent Patient	Alex Michaelides	Thriller	₹399	<div>EditDelete</div>
Atomic Habits	James Clear	Self-Help	₹499	<div>EditDelete</div>
The Alchemist	Paulo Coelho	Fiction	₹350	<div>EditDelete</div>
A Brief History of Time	Stephen Hawking	Science	₹599	<div>EditDelete</div>
Wings of Fire	A.P.J. Abdul Kalam	Autobiography	₹299	<div>EditDelete</div>
The Hobbit	J.R.R. Tolkien	Fantasy	₹450	<div>EditDelete</div>
The Subtle Art of Not Giving a Fck*	Mark Manson	Self-Help	₹399	<div>EditDelete</div>
Harry Potter and the Sorcerer's Stone	J.K. Rowling	Fantasy	₹550	<div>EditDelete</div>

Admin updating the order status:



The screenshot shows the BookNest Admin Panel. At the top, there is a navigation bar with links: Home, Books, My Orders, Cart, Wishlist, User, Admin, and a Logout button. Below the navigation bar, the 'All Orders' section is displayed. It contains a table with the following columns: Order ID, User, Books, Total Price, Address, Date, and Status. A single order is listed with the following details: Order ID: 685b0ab6a66514c63665d5c1, User: abc, Books: Rich Dad Poor Dad x 1, Total Price: ₹399, Address: Rajendra Nagar, Gudivada, Andhra Pradesh, India, Date: 25/6/2025, 1:59:42 am, and Status: Shipped. A dropdown menu is open next to the 'Shipped' status, showing options: Processing, Shipped (selected), Delivered, and Cancelled.

Order ID	User	Books	Total Price	Address	Date	Status
685b0ab6a66514c63665d5c1	abc	Rich Dad Poor Dad x 1	₹399	Rajendra Nagar, Gudivada, Andhra Pradesh, India.	25/6/2025, 1:59:42 am	Shipped

8. ADVANTAGES & DISADVANTAGES

Advantages

- Full-Stack Control – Built entirely using the MERN stack, allowing unified JavaScript codebase across client and server.
- Modular Design – Separation of frontend, backend, and database ensures maintainability and scalability.
- Secure Authentication – Uses JWT for secure user login, with role-based access for admin functionalities.
- Responsive UI – Built with Tailwind CSS and React, the interface is fast, responsive, and user-friendly across devices.
- Wishlist and Cart Functionality – Enhances user experience by allowing item tracking and personalized browsing.
- Admin Panel – Allows book and user management, and order status tracking by privileged users.
- NoSQL Flexibility – MongoDB allows easy schema evolution and scaling of collections like books and orders.

Disadvantages

- No Real Payment Integration – Orders are placed without actual payment gateway support.
- Admin Role Manual Setup – Admin accounts must be assigned manually in the database.
- Token Expiry Handling Not Implemented – JWT refresh tokens are not in place, requiring users to log in again after expiration.
- No Mobile App – The solution is currently web-only, limiting reach for mobile-first users.
- Limited Testing Coverage – Lacks automated unit or end-to-end test cases, making regression testing manual.

9. CONCLUSION

Booknest is a fully functional, scalable, and secure online bookstore platform developed using the MERN stack. It offers a seamless user experience, allowing customers to browse, wishlist, and purchase books, while providing admins with full control over content, users, and orders.

The project demonstrates complete ownership over all layers of web application development—from system design and frontend development to backend API creation and database integration. The platform can serve as a foundation for real-world deployment and further enhancements such as payment integration, mobile support, and cloud deployment.

Through Booknest, the goal of delivering a modern, responsive, and modular online bookstore solution has been successfully achieved.

10. FUTURE SCOPE

The Booknest project can be significantly expanded and improved in the following ways:

Online Payment Gateway

- Integrate Razorpay or Stripe to support secure real-time payments.

Mobile Application (React Native)

- Develop a cross-platform app for better mobile usability.

Review and Rating System

- Allow users to review and rate books, improving decision-making and engagement.

Advanced Search and Filters

- Add autocomplete search, price range filters, and personalized recommendations.

Email/SMS Notifications

- Notify users on order confirmation, shipping, and delivery updates.

Role Management UI

- Enable admin role assignment via the frontend rather than manual DB updates.

Cloud Deployment

- Host the frontend (Vercel/Netlify) and backend (Render/Heroku) for public access.

Analytics Dashboard for Admins

- Visualize sales, inventory, and user metrics using charts and reports.

AI-Based Recommendations (Future)

- Suggest books to users based on purchase history or interests using ML.

Multilingual Support

- Add regional language support to improve accessibility.

11. APPENDIX

Source Code:

Home.jsx:

```
// src/pages/Home.jsx
```

```
import { Link } from "react-router-dom";
```

```
const Home = () => {
```

```
return (
```

```
  <div className="flex items-center justify-center min-h-screen bg-gradient-to-r from-indigo-100 to-blue-100">
```

```
    <div className="text-center px-4">
```

```
      
```

```
    <h1 className="text-4xl md:text-5xl font-bold text-purple-700 mb-4">
```

```
      Welcome to BookNest
```

```
    </h1>
```

```
    <p className="text-lg text-gray-700 max-w-xl mx-auto mb-6">
```

```
      Discover, collect, and manage your favorite books with ease. <br />
```

```
      BookNest is your personal digital bookstore. <br />
```

```
      Register to explore a growing collection!
```

```
    </p>
```

```
    <div className="flex justify-center gap-4">
```

```
      <Link
```

```
        to="/register"
```

```
        className="bg-green-600 hover:bg-green-700 text-white px-5 py-2 rounded"
```

```
      >
```

```
        Register
```

```
      </Link>
```

```
    <Link
```



```
        to="/login"

        className="bg-blue-600 hover:bg-blue-700 text-white px-5 py-2 rounded"

    >

        Login

    </Link>

</div>

</div>

</div>

);

};
```

export default Home;

NOTE: Entire source code files are uploaded in the GitHub repository

GitHub Link: <https://github.com/Yogasrivalli/BookNest-Where-Stories-Nestle>

Demo

Link:https://drive.google.com/file/d/1QqQpnmea_b1MMM1O40HeEfmi92c9vscj/view?usp=sharing