Alexandria

The Library of Today

Creators

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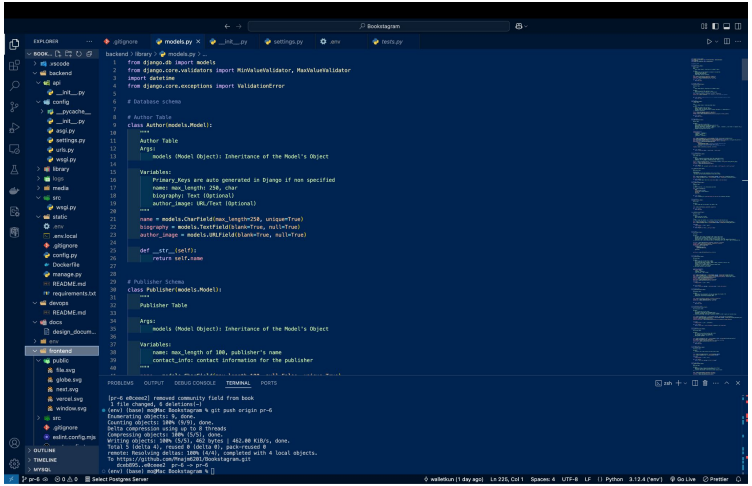
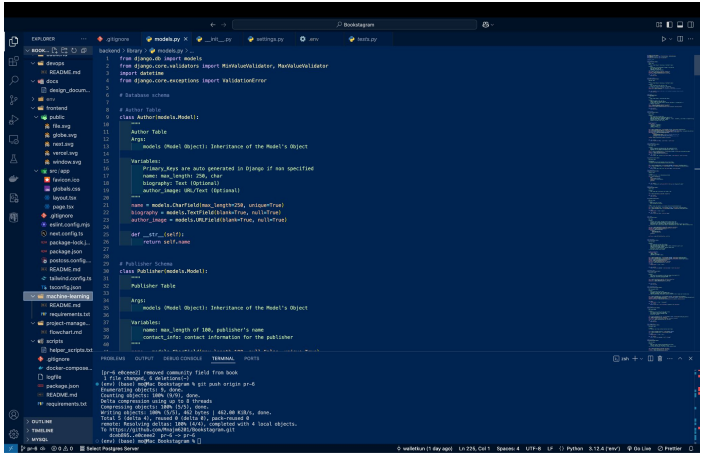
Github Repository

Link: https://github.com/Mnajm6201/Bookstagram

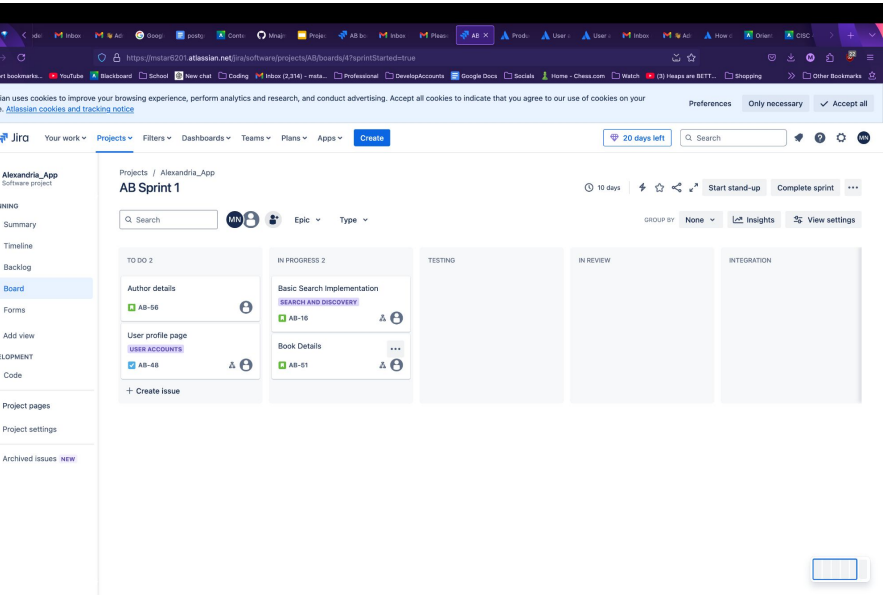


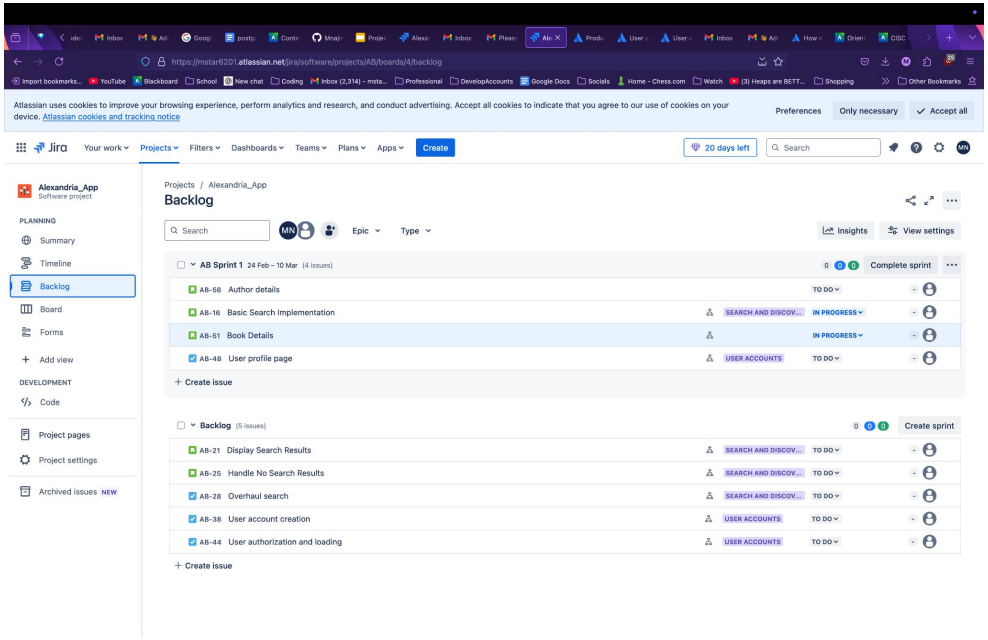


Project Management

Link: https://mstar6201.atlassian.net/jira/software/projects/AB/boards/4

Project Management cont.





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Project Vision

Alexandria is a complete resource and community app for book lovers. Users can search and find any published book. They can add books to their customized shelves which serve to portray their tastes and creative pairings. Users can share and discuss their shelves. Users can add metadata to their books, like if they've read, want to read, are currently reading (along with current page number), or own that book, metrics visible to other users. Users can see where the book is available to purchase online. Bookstores can upload their catalogue to the application to make their relative stock visible to local users. Users can also see if the book is in stock at a local library. Users can lend their books to other users in a peer to peer lending system. Users can message each other. Users can review books. Each book will have a community page, moderated by an AI, to discuss books. Posts can be filtered by relevant page numbers (prevent spoilers). Users can start and participate in book clubs. Users can create and partake in user-generated quizzes and polls. Users can organize events. Users can start and participate in reading challenges. Users can see relevant books, and recommended books through algorithmic/ml suggesting.

Uses Cases

We have devised a list of user stories to demonstrate use cases, and to aid in the completion of project in an agile workflow.

User Stories

- As a reader, I want to search for books by title, author, ISBN, genre or ‘mood’, so that I can find books that I want to read.
  - The search bar must be displayed on the homepage and search results page.
  - Users must be able to enter a book title, author name, or ISBN, genre or mood in the search field.
  - Search results must display at least 10 books per page with title, author, and cover image.
  - If no results are found, a “No books found” message should be displayed.
  - API calls should return results quickly for an optimal experience.

User Stories Cont.

- As a reader, I want to see all relevant details about a book, so that I can learn more about reading or purchasing it.
  - Each book detail must display title, author, cover image, genre, synopsis, and publication year.
  - Users must see alternate editions with different covers.
  - Users can see ratings and reviews from other readers.
  - Users can mark a book as “Read”, “Want to Read”, or “Currently Reading”, which is visible to others.
  - Users can update their current page number in the book.
  - Users can connect their ebook platform / audiobook platform to automate page updates.
  - Users can mark a book as “Owned”, which is visible to others.
- As a reader, I want to add books to custom shelves, so that I can organize my books the way I prefer, and portray my tastes.
  - Users must be logged in to create shelves.
  - Users can create custom shelves with a name (max 50 characters).
  - A book can be in multiple shelves at the same time, but the same edition cannot be in one shelf more than once.
  - Users can rename or delete shelves, but books remain in the database.
  - Shelfs changes must be reflected instantly in the UI.
  - Shelves can be shared with other users.
  - Shelves can be seen on a user profile to other users.
  - Shelves can be made private to hide from other users.

User Stories Cont.

- As a reader, I want to review books and see what others think, so that I can share and discover opinions.
  - Users must be logged in to submit a review.
  - Users can leave a star rating (1-5) (with fractional .5) and written reviews.
  - Reviews must be changeable and deleted.
  - Reviews must be moderated by algorithmic filtration.
  - Reviews must display date, user name, and rating.
  - Users can like or reply to reviews.
  - A review’s likes and number of reviews must be visible to users.
  - A user’s review getting a response generates a user notification.
  - A book’s review’s must be orderable through date, relevance, and rating and filtered to show by language.
  - Users can report inappropriate or spam reviews, and a system must be in place to review these reports.

User Stories Cont.

- As a community member, I want to discuss books in a forum, so that I can engage with other readers.
  - Every book has a dedicated discussion page.
  - Users can post discussion topics and reply.
  - Posts can be sorted by most active, most recent, or by relevance.
  - AI and algorithmic moderation must flag inappropriate discussions.
  - Users can add relevant page numbers to post.
  - Users can filter discussions to none after their current page number to avoid spoilers.
- As a reader, I want to see where I can purchase or borrow a book, so that I can choose the best way to access it.
  - The book’s detail page must show online retailers with prices and formats (hardcover, paperback, audiobook).
  - Retailers should include Amazon, Bookshop, IndieBound, and Google Books via API integration.
  - Users should see local bookstore stock availability.
  - Bookstores must be given an accessible API to upload and update their stock to their page.
  - Users should see library availability and be able to launch to the library's website via a link.
  - Users should see if a book is being lent by a nearby user.
  - If no purchase or borrowing options exist, display “Not currently available”.

User Stories Cont.

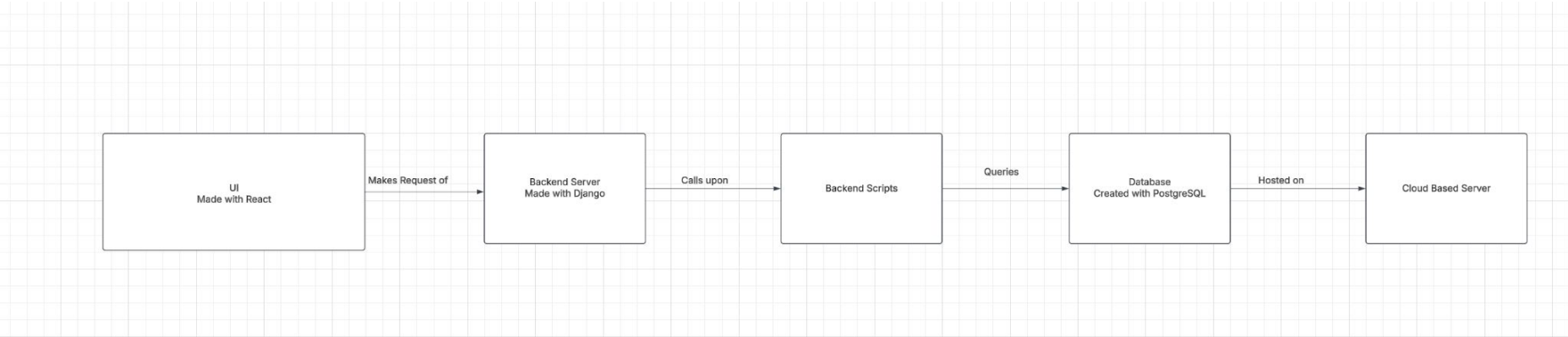
- As a book owner, I want to offer my books for lending, so that others can borrow them.
  - Users can mark a book as “Available for lending”.
  - Borrowers can search for books available for lending in their area.
  - Users can send lending requests via in-app messaging.
  - Lenders can accept or reject requests.
  - Users should have a ‘borrower credit score’ visible to lenders based on account age and past lending behavior.
  - Once a book is lent, it should be marked as “Currently Lent Out”
- As a reader, I want to join a book club, so that I can read and discuss books with a group.
  - Users can create public or private book clubs.
  - Private clubs require an invitation to join.
  - Each club has a dedicated discussion forum and group chat.
  - Book club owners can assign moderator roles.
  - Users can set reading schedules for clubs.

User Stories Cont.

- As a reader, I want to participate in reading challenges so that I can track my progress and stay motivated.
  - Users can join public or private reading challenges.
  - Users can set custom reading goals.
  - Progress is tracked based on books marked as “Read”
  - Users can earn badges for completing challenges.
- As a reader, I want to see personalized book recommendations, so that I can discover new books based on my taste.
  - The system must analyze reading history, reviews, and user preferences.
  - Recommendations should update as users read more books.
  - The system should suggest related book clubs and discussions.
  - Users can provide feedback on recommendations to improve accuracy.
- As a reader, I want to see a discovery page where I can find relevant books and discussions.
  - A discovery page must be a visible notch on the application.
  - The discovery page must show relevant user recommendations based on recommendations, new or currently popular books, and business selected moderator content

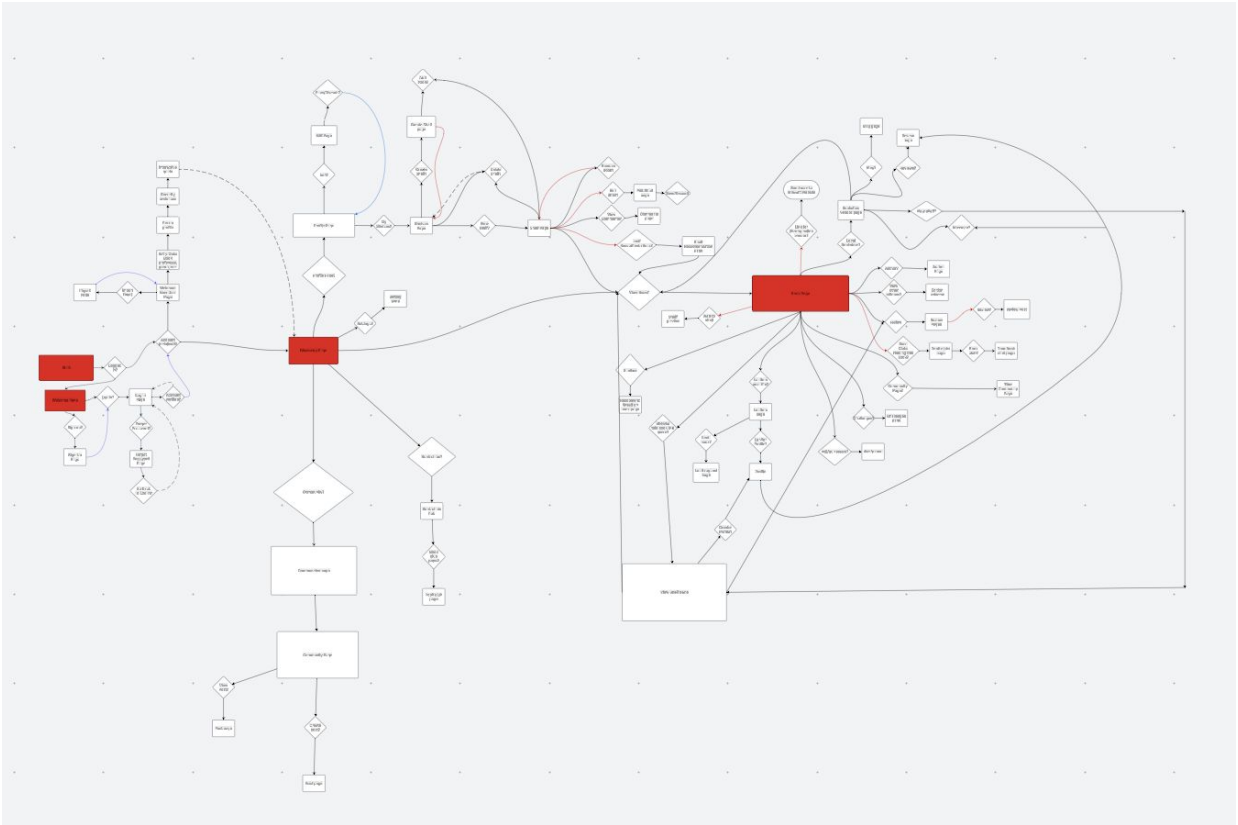
Application Logic

Created with Lucid Chart



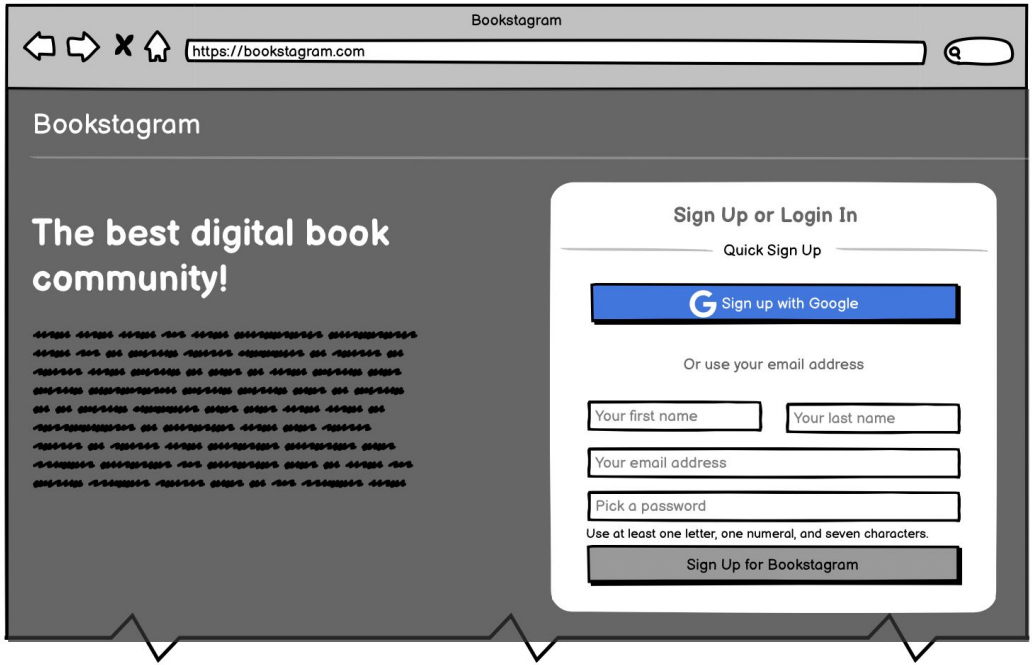
User Flow

Created with Lucid Chart



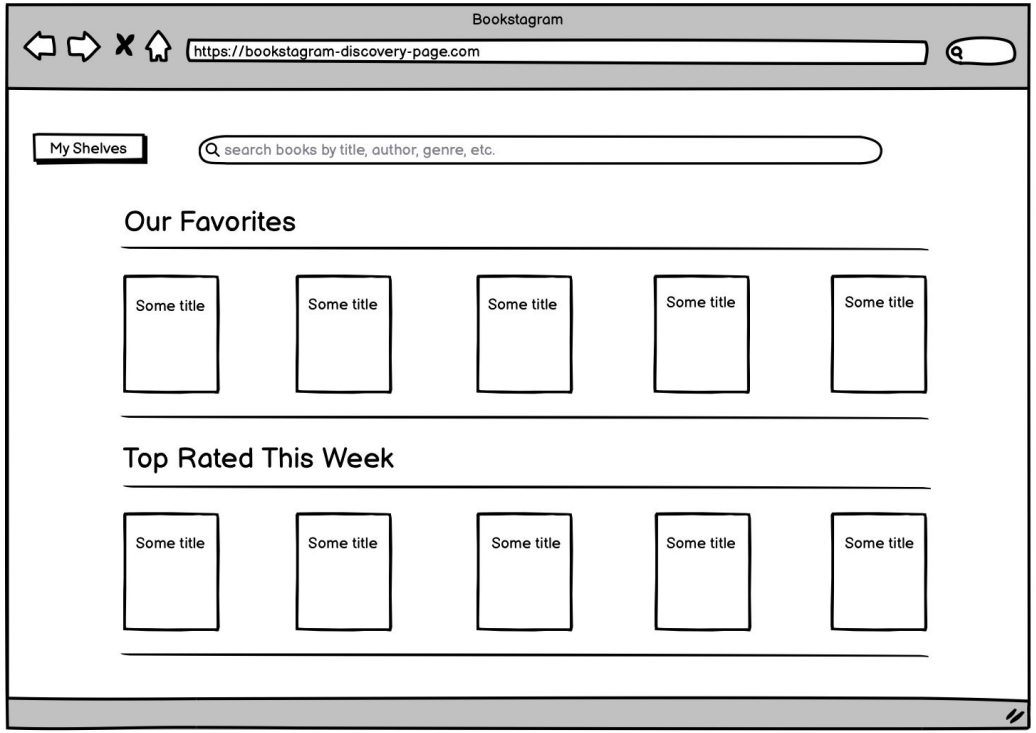
Wire Frames

Landing Page



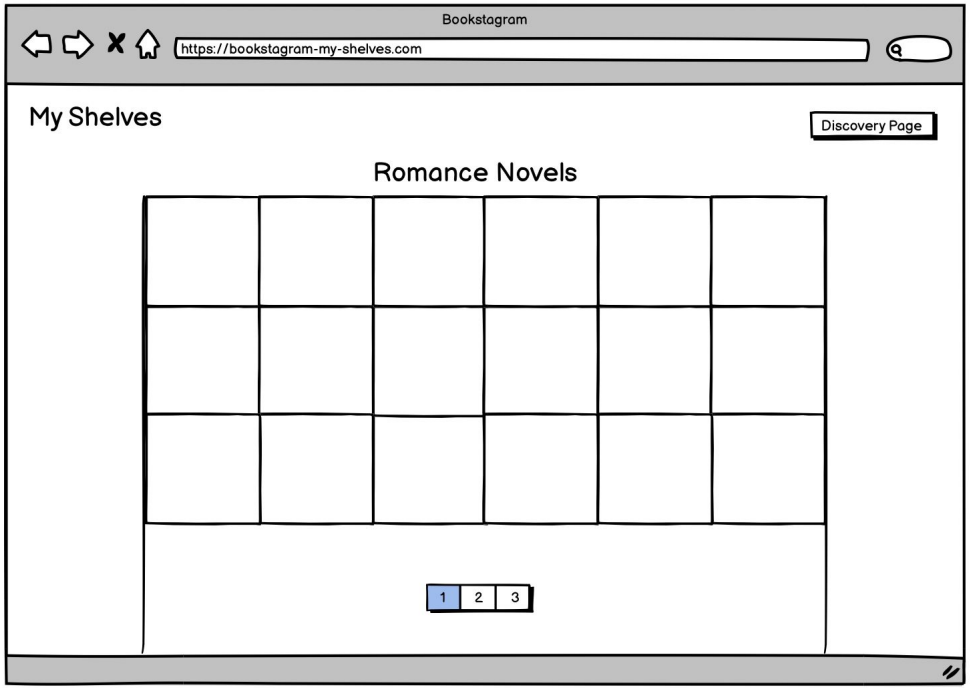
Wire Frame Cont.

Discovery Page



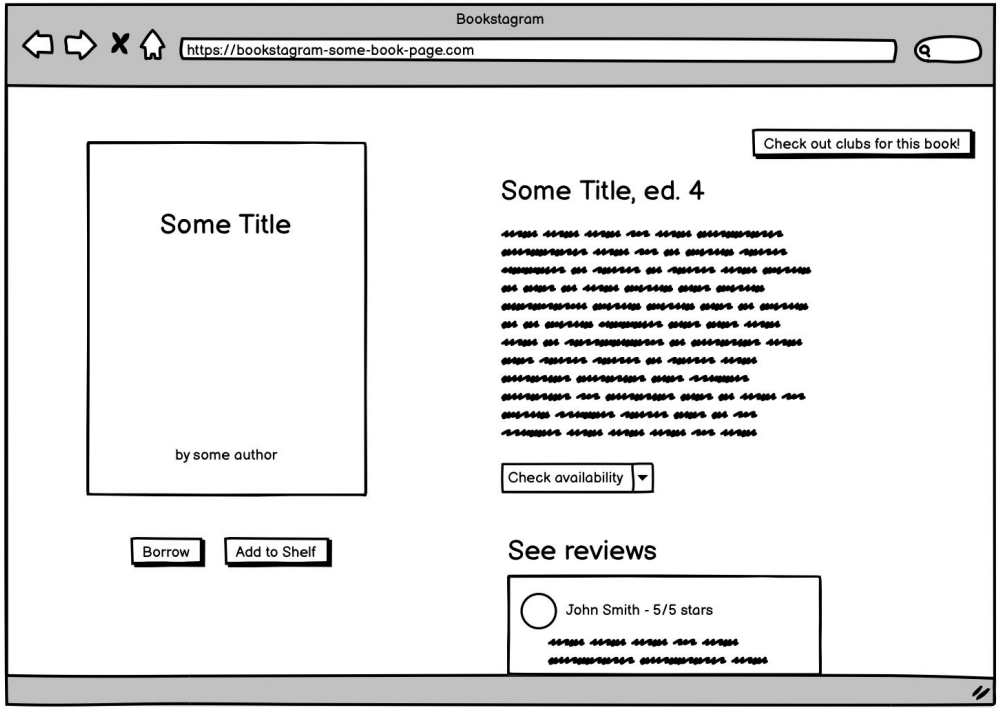
Wire Frame Cont.

Shelves Page



Wire Frame cont.

Book Page



Business Rules

Book:

- Each book must have a title.
- Each book must have multiple editions but must have at least one, and each edition belongs to one and only one book.
- Each edition must have one unique ISBN.
- Each book can have multiple authors, but must have at least one.
- Each book must belong to at least one genre, and every genre can have many books.
- Each edition must have a publication year, and that publication year cannot be in the future.
- A book can be in multiple formats, but at least one (hardcover, paperback, ebook, audiobook, ect). An edition can have only one format.
- Each edition must have at least one cover image.
- Each edition must have a language it is written in.
- An edition must have one and only one publisher.
- A book can belong to multiple shelves, but may belong to none.
- A book can have many reviews, but may have none.
- Each book has an average rating, if it has at least one review, or it is marked with unrated.
- Each book has one community, and each community belongs to one book.
- Each book can be read by many book clubs, or may be read by no book clubs.

Business Rules Cont.

Authors:

- An author may have authored multiple books, but must have authored at least one.
- An author must have a name, biography and image.

Publisher:

- A publisher may have published multiple books, but must have published at least one.
- A publisher must have a name and contact information.

Users:

- Each user account must be associated with one and only one valid email address, but an email address can be changed.
- Each account must have one and only one password, and that password must be secured securely.
- A user must have one and only one unique identifier (username), but that username may be changed.
- A user may have one and only one profile image, and that image must be in a valid format (JPG, PNG, WebP).
- A user can have many shelves or have none.
- Each user has a set of special shelves, called ‘owned’, ‘want to read’, ‘reading’ and ‘read’.

Business Rules Cont.

- Each unique book on a user’s shelf may have statuses such as ‘owned’, ‘want to read’, ‘reading’, and ‘read’. These options, with the exception of ‘owned’ are radioed -- a user can only choose one for each book.
- Each unique book on a user’s shelf which has the status ‘reading’ may have an associated. updatable, page number
- A user can be a part of many communities, but may be a part of none.
- A user can be a part of many clubs, but may be a part of no clubs.
- A user can have many other users as followers, but may be followed by no one.
- A user can follow many other users, but may follow no one.
- A user can have many achievements but may have none.
- A user can have made many reviews, but may have made none.
- A user may have their name, contact information, links to other social media pages, general location, and profile description attached to their account.
- A user has a list of their privacy, security, and personalization settings.
- Each user has a trust level determined by account and lending history

Business Rules Cont.

Shelves:

- A user can create many shelves, but a shelf must belong to only one user.
- A shelf name must be unique for that user.
- A shelf can have multiple books, or have no books.
- Each edition can only appear once per shelf
- Each shelf can either be private or public.
- Each user has a set of special shelves, called ‘owned’, ‘want to read’, ‘reading’ and ‘read’.

Lending:

- A user can only lend books they have marked as ‘owned’.
- A book may have either of two statuses, ‘Available’ and ‘Lent out’.
- A lending request must be approved or rejected within 7 days, or it expires.
- A book that has been lent out, must have an agreed upon return day.
- Borrowers must confirm when they return a book, and the lender must verify before marking it ‘Available’ again.

Book clubs:

- A user can create multiple book clubs, but each club must have a unique name.
- Each book club is either marked as private or public.
- Each book club can have many users, but must have at least one user.
- Each book club has one and only one discussion hub.
- Each book club must have at least one moderator.

Communities:

- Each book has one and only one community page, and each community page belongs to one and only one book.
- A community page may have many posts, or may have no discussion posts.

Business Rules Cont.

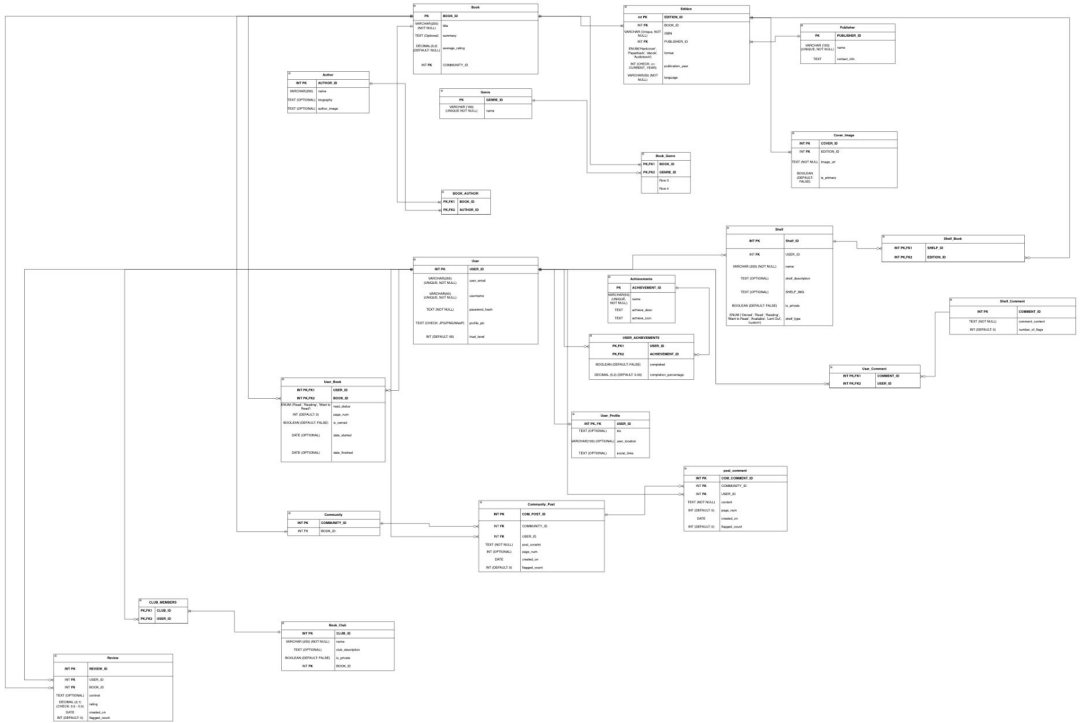
Discussion Posts:
- Each discussion post belongs to one and only one community page or book club discussion hub.
- Each discussion post has one and only one user account associated with it.
- Each post has a record of the number of times it has been flagged for violating ToS.
- A post may have an associated page number, to symbolize what part of a book the post is for.

Reviews:
- Each review is associated with one and only one user account.
- Each review is associated with one and only one book.
- Each review must have a rating, ranging between 0.0 and 5.0 at 0.5 increments.
- Each review has a record of the number of times it has been flagged for violating ToS.

Book Vendors:
- Each vendor must have an account page.
- Each vendor must be verified to upload inventory.
- Each vendor must have at least one non empty shelf.
- Each vendor must have a location verifiable with google maps.
- Each vendor must have contact information.

Book Availability:
- A book’s availability must be updated at least once per day.
- A book's price must be stored as a decimal price.
- Online and library availability is read only, fetched via API, and is cached for performance.

ERD (Made with draw.io)



Tech Stack

Category	Tools	Versions	Purpose
Front End	NextJs	15.x	Framework for React-based SSR & routing
	ReactJs	19.0.0	Component-based UI development
	TypeScript	5.0.0	Type safety for frontend code
	Tailwind Css	3.4.1	API development & serialization
Back End	Python	3.11.11	Backend Language
	Django	5.1.6	Web Framework for backend API
	Django REST Framework (DRF)	3.15.2	API development & serialization
	Drf-spectacular	0.28.0	API documentation
Database	Postgre-SQL	15	Relational database adapter for Django
	psycopg2-binary	2.9.10	PostgreSQL database adapter for Django
	Django-environ	0.12.0	Management environment variables
	Django-cors-headers	4.7.0	Manages CORS for frontend-backend communication
Devops & Deployment	Docker	25.0.2	Containerization of backend and frontend
	Docker Compose	2.24.3	Manages multi container setup
	Kubernetes	1.32.2	Container orchestration
	Terraform	1.5	Infrastructure as Code(AWS /GCP)
	Nginx	1.25	Reverse Proxy & load balancing
	Gunicorn	21.2.0	WSGI server for Django

Tech Stack Cont.

Machine Learning	DLRM (Deep Learning Recommendation Model)	Latest	Recommendation model for book suggestions
	Pytorch	2.1	ML Framework to support DLRM
	FastAPI	0.110	Serving ML models as a microservice

Data Sources

As of now we know we will be using:

Internet Archive API to populate database with book information

and

Worldcat API to check library availability

Timeline

PoC (end of week 1):
Database set up, query scripts, basic UI structure, scrappers for book covers.

- As a reader, I want to search for books by title, author, ISBN, genre or ‘mood’, so that I can find books that I want to read.
- As a reader, I want to see all relevant details about a book, so that I can learn more about reading or purchasing it.

Prototype (week 2-3):
User system set up, user database, user authentication, user security, user profiles.
Shelf system.
Book availability.
Review System
UI improvement

- As a reader, I want to add books to custom shelves, so that I can organize my books the way I prefer, and portray my tastes.
- As a reader, I want to review books and see what others think, so that I can share and discover opinions.
- As a reader, I want to see where I can purchase or borrow a book, so that I can choose the best way to access it.

Pilot (week 4-7):
Community engagement
Lending system
Messaging
User credit score
Profile personalization
Book club and events
UI polish

- As a community member, I want to discuss books in a forum, so that I can engage with other readers.
- As a book owner, I want to offer my books for lending, so that others can borrow them.
- As a reader, I want to join a book club, so that I can read and discuss books with a group.
- As a reader, I want to participate in reading challenges so that I can track my progress and stay motivated.

Give app access to beta testers, hosted locally, to flesh out user opinion.

Time Line cont.

MVP(week 8-11):
Bookstore availability
User generated content (polls, ect)
Book personalization
User security

- As a reader, I want to see personalized book recommendations, so that I can discover new books based on my taste.
- As a reader, I want to see a discovery page where I can find relevant books and discussions.

UI finalization
Test Test Test !!!!
Demo video

MLP (Week 11-13 - inf):
Live deployment, AWS integration, track users, advertisements.
Mobile Apps (android, IOS)
Desktop native application
Get bookstores on board
Generate user interest.