Architecture Document

Event-Driven

Uses events to trigger and communicate between microservices, allowing real-time data processing and

communication.

Implementation for Book Bazaar:

User Registration
- **Event 1**: User submits registration details (e.g., name, email, password).
- **Event Handler**: Validates user input, stores user details in the database, and sends a welcome or confirmation email.
- **Event Loop**: Monitors registration submission, validates the data, adds the event to the event queue, and once processed, it triggers an email confirmation event.
- **Event Flow Layers**:
    - o **Event Producer**: User.
    - o **Event Consumer**: Authentication Service (handles registration), Email Service (sends confirmation). o **Event Channel/Router**: API Gateway.

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2 Book Listing Creation
- **Event 2**: Seller submits a new book listing with details such as title, author, condition (new/old), price, description, and customizable cover options.
- **Event Handler**: Processes the listing data, saves it to the database, and triggers customization options.
- **Event Loop**: Ensures that the book listing is correctly saved and customizable cover options are made available.
- **Event Flow Layers**:
    - o **Event Producer**: Seller.
    - o **Event Consumer**: Book Listing Service (saves book details), Customization Service (provides cover options).
    - o **Event Channel/Router**: API Gateway or Message Queue.

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3. Book Purchase Request Submission
- **Event 3**: Buyer submits a purchase request for a book (new or old).
- **Event Handler**: Validates the purchase request, checks stock availability, reserves the book, and sends a confirmation of the purchase.
- **Event Loop**: Manages the purchase process, ensures stock availability checks, processes the payment, and confirms the order.
- **Event Flow Layers**:
    - o **Event Producer**: Buyer.
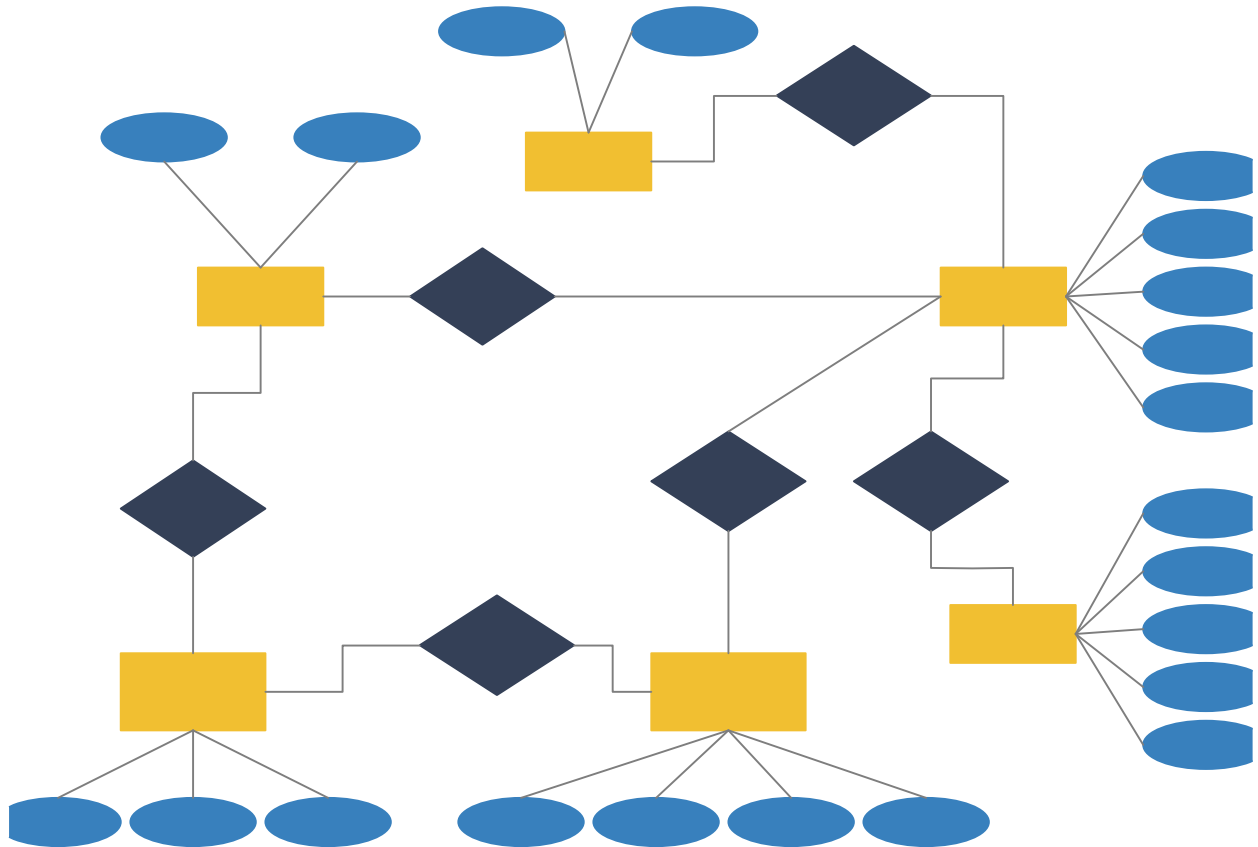
4. Customizable Book Cover Creation

- **Event 4**: Buyer opts for customizable book covers for a book purchase.
- **Event Handler**: Processes the customization options selected by the buyer and sends the design to be applied to the book.
- **Event Loop**: Ensures that the customizable options are processed, stored, and sent to the print service.
- **Event Flow Layers**:
    - **Event Producer**: Buyer.
    - **Event Consumer**: Customization Service (handles cover designs), Print Service (applies designs to the book).
    - **Event Channel/Router**: API Gateway or Messaging Queue.
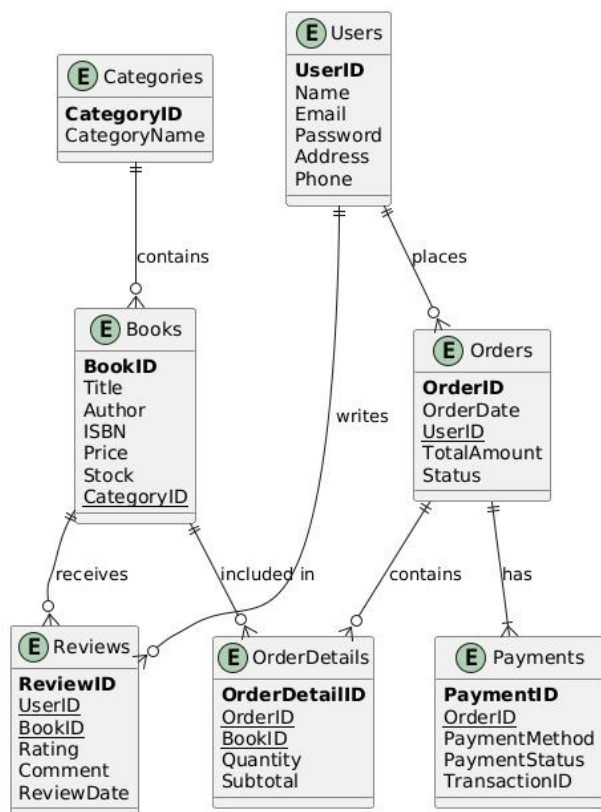
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5 Community Engagement between Readers

- **Event 5**: Reader posts a comment, review, or engages with other users in the community section of the platform.
- **Event Handler**: Validates the post, stores it in the community database, and sends notifications to relevant users.
- **Event Loop**: Monitors the engagement process, ensuring that community rules are adhered to and that notifications are sent in real-time.
- **Event Flow Layers**:
    - **Event Producer**: Reader.
    - **Event Consumer**: Community Service (stores comments/posts), Notification Service (sends engagement alerts).
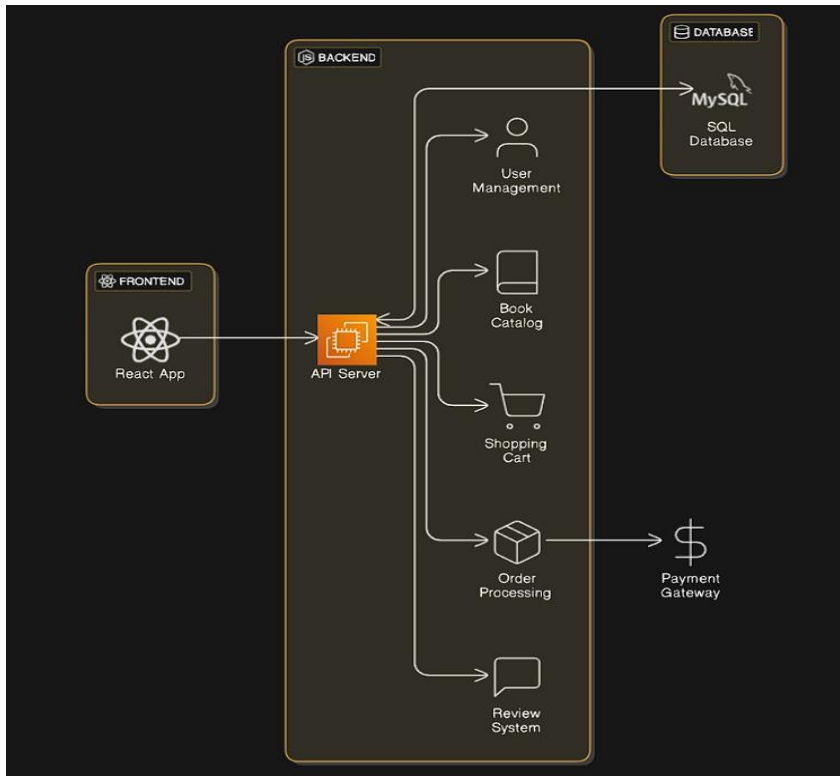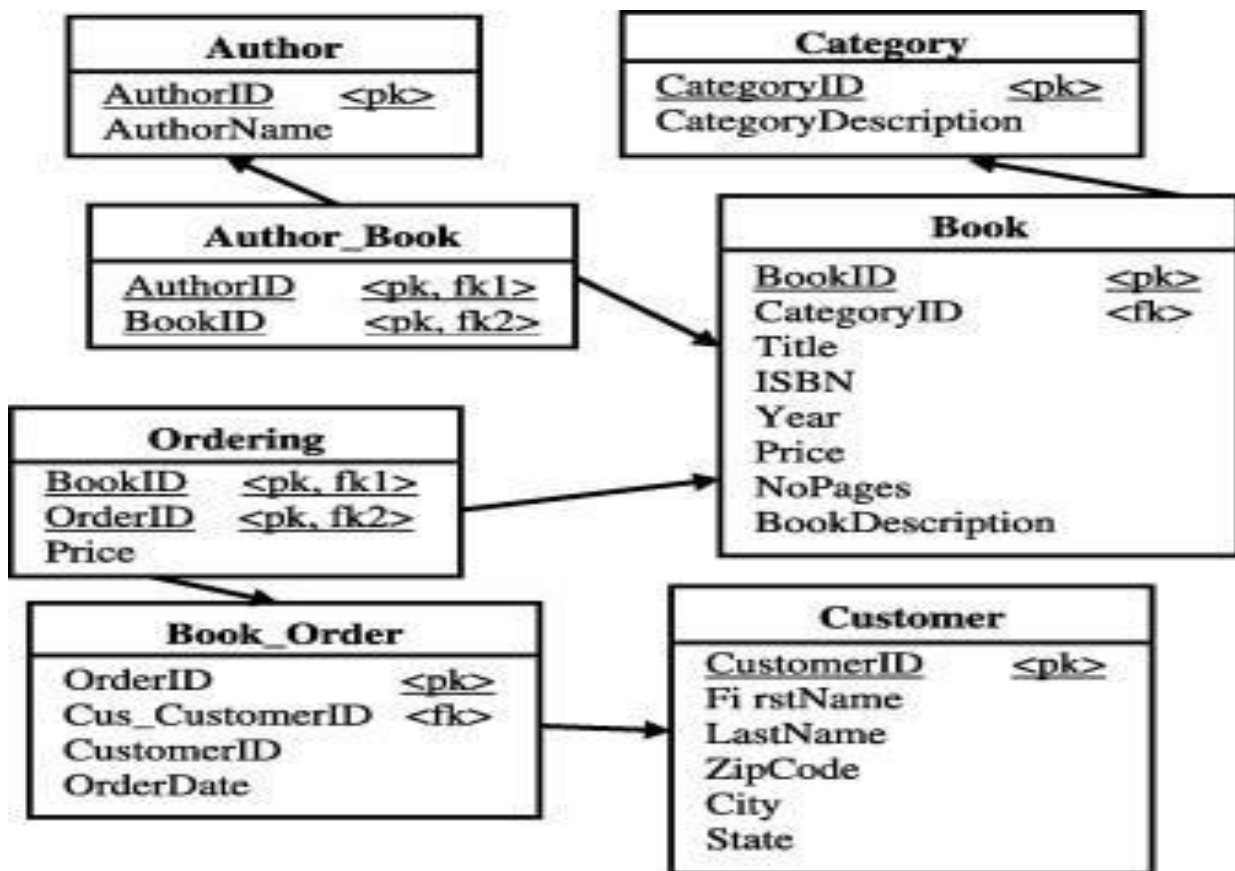
1. Database

1. ER Diagram

Online E-Commerce Book Store ER Diagram

Categories
CategoryID
CategoryName

Users
UserID
Name
Email
Password
Address
Phone

contains

places

Books
BookID
Title
Author
ISBN
Price
Stock
CategoryID

Orders
OrderID
OrderDate
UserID
TotalAmount
Status

writes

receives

included in

contains

has

Reviews
ReviewID
UserID
BookID
Rating
Comment
ReviewDate

OrderDetails
OrderDetailID
OrderID
BookID
Quantity
Subtotal

Payments
PaymentID
OrderID
PaymentMethod
PaymentStatus
TransactionID

2. Schema Diagram

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Frequency of Data Exchanges

2. **Real -Time Updates**:
   o **Order Status**: Updates on order requests, confirmations, cancellations, and shipping statuses for both new and second-hand books.
   o **Inventory and Pricing Adjustments**: Changes in book stock availability and pricing, including special discounts and customizable cover options.
   o **Customer Support Interactions**: Real-time updates on support tickets, user queries, and resolutions.
3. **Daily Syncs**:
   o **Book Listings**: Updates to book descriptions, media uploads (cover images, condition photos for second-hand books), and customization options.
   o **User Reviews and Ratings**: Daily aggregation of new reviews and ratings to keep the information current on books and sellers.
   o **Payment and Transaction Records**: Daily reconciliation of transactions, payment status, and processing updates.
4. **Weekly Reports**:
   o **Analytics Data**: Reports on book sales trends, pricing performance, popular books, and user engagement. o **Review Insights**: Aggregated data on review trends, average ratings, and customer feedback for analysis. o **Seller Performance**: Weekly summaries of seller activity, response times, and order fulfillment rates.

Data Sets

- **Book Listings**: o Detailed descriptions of new and used books, including title, author, ISBN, genre, condition (for second-hand books), customizable cover options, and media files (images, videos).
  o Availability data such as stock levels, shipping options, and estimated delivery times for physical books.
  o Information on special promotions, discounts, or bundles (e.g., buy 1 get 1 free).
- **Order Information**: o Order requests, confirmations, cancellations, transaction records, shipping information, and payment details.
  o Status updates on order fulfillment, shipping progress, and delivery confirmations.
- **Pricing Details**: o Information on book pricing tiers, special offers, customizable cover fees, discounts, and seasonal pricing adjustments.
  o Historical pricing data to track changes over time for both new and second-hand books.
- **User Reviews and Ratings**: o Review content, star ratings, reviewer details (usernames, verified purchase status), and timestamps.
  o Sentiment analysis on review trends and keyword data to identify popular or critical aspects of books and sellers.
- **Customer Support Interactions**: o Support tickets, communication logs between users and customer service or sellers, resolution statuses, and user feedback on service.
  o Escalation events related to disputes or complex inquiries, such as order issues or customization requests.

Payment Information:

- Payment records including transaction amounts, payment methods (credit card, digital wallet, etc.), payment statuses (pending, successful, failed), and refund requests.
- Payment gateway integration details for secure transactions, including verification data, processing fees, and payout schedules for sellers.