Bookstore Online: An e-Commerce Bookstore System

Business Case / Problem Statement

Bookstore Online is an e-commerce application that will sell books of all types to its customers online. Bookstore Online buys its book stocks from Publisher through issuance of Purchase Order document by head of the purchasing department. It receives delivered goods from supplying publishers by accepting a Good Receipt document by the head of the Inventory department. The Goods Receipt document is used to validate the quantity supplied and upon verification the delivered Books are stocked into the Bookstore Inventory.

Bookstore Online sells books of the following types: FICTION, THRILLER, HORROR etc. Customers can browse available books in stock and search for books by Title, Author, Genre and Publication Year. To purchase Books of interest, Customers will be required to register with Bookstore Online. The registration opens an Account for a Customer with Bookstore Online. The registration details include; First Name, Last Name, email and Phone Number. Customers will be able to view their Purchase History.

Items (Books) selected during shopping are placed in the Shopping Cart to keep track of Items selection by the Customer. Customers will be able to proceed to Checkout where they can make Payment for the total cost of the Items in their Shopping Cart. When a Customer's proceeds to Checkout, this event is captured as a Purchase order for the Customer.

To Checkout a Shopping Cart, Customers can be required to provide additional information that is used to process their Purchase Order. The additional information include; Billing Address, Shipping Address and Payment Type. Bookstore Online will integrate with a Payment provider to facilitate Payment processing during Checkout and support the option to select a Payment Type that suits the Customer preference. Payment Types will include Bank Transfer, USSD and Web Payment (Card).

Functional Requirement

Bookstore Online will provide the following capabilities that support and enable it to deliver its business operations digitally. These business operations include the following;

Inventory Management: is the business operation that manages the stock of available books, quantity sold and quantity to be placed on Purchase Order to restock inventory. Stocking the inventory is carried out by the Purchasing department head, where a Purchase Order is raised to capture the book titles and quantities to be placed on order. The purchase order is then delivered at Bookstore Online warehouse, where it is received by the head of the Inventory department.

The head of the inventory department also receives the Goods Receipt for the delivered order and uses the Goods Receipt to verify the delivered goods and updates the inventory for each book title. The Goods Receipt is also used to update the Bookstore Online inventory to sync the inventory status of both physical warehouse and the Bookstore inventory.

Book Search Facility: The search functionality will allow books to be searched with different criteria such as Title, Author, Genre and Publication Year.

Order Management: is the business operation that follows through the customer shopping experience from the point of browsing, to placing items in their shopping cart, to checking out and to having the order delivered to the customer shipping address.

Customer Relationship Management: is the business process that manages information about Bookstore Online customers. As part of the process, customers are required to be registered on Bookstore Online to have an account opened for them. A registered account will have a digital ID which is an identity that abstracts the personal information away from the identity used for shopping on Bookstore Online. Registered users will be able to log into Bookstore Online to place orders for books and make payment.

Payment Integration: This is the functionality that facilitates making payment for purchase orders. The payment functionality enable customers to make payment using payment types such as USSD, Bank Transfer and Web Payment (Card)

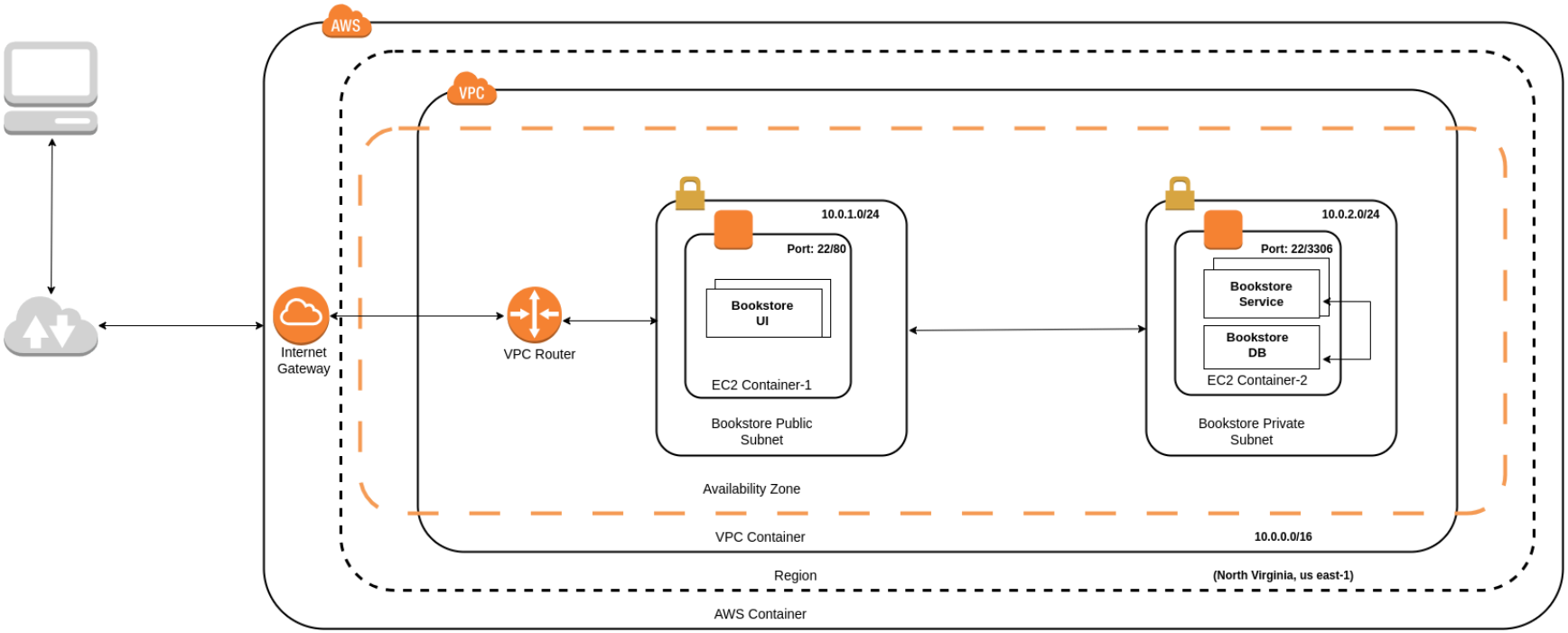
Non Functional Requirement

Bookstore Online will be expected to meet the following characteristics;

Performance: It is expected that the Bookstore Online will be fast in terms of response time and latency during requesting processing.

Scalability: It is expected that Bookstore Online will be able to cope with increasing levels of demand in concurrent request processing.

System Architecture



Application Architecture

Requirement Analysis & Design

From the Problem Statement, the following architectural characteristic were elicited;

- 4 categories of users have been identified namely; Customers, Purchasing Head, Bookstore Admin and Inventory Head
- A Book is written by at most 1 Author.
- An Author writes at least 1 Book
- Only registered User can purchase books

Use Cases

Interaction with the system from the problem statement has been identified to be among 4 user categories and categories perform a unique set of functions. The functions that can be performed by each user category is analyzed below:

Bookstore Admin

- Register a new Staff Account
- Assign a Staff to a Department
- Assign a Staff to a Job Function

Customer

- Register as a new Customer
- Sign in into Account
- Add Books to Shopping cart
- Remove Books from Shopping cart
- View Items in the Shopping cart
- Check out the Shopping cart

Purchasing Dept. Head

- Signs in into Job role
- Receive request for Inventory List
- Raise Purchase Order for Inventory List

- Obtain approval for Purchase Order
- Transmit Purchase Order to Publisher

Inventory Dept. Head

- Signs in into Job role
- Record a new Book
- Add new Book to stock
- Update the stock of an existing Book
- Produce the list of stocks available
- Produce the list of stocks unavailable
- Produce the list of stocks sold

Analysis

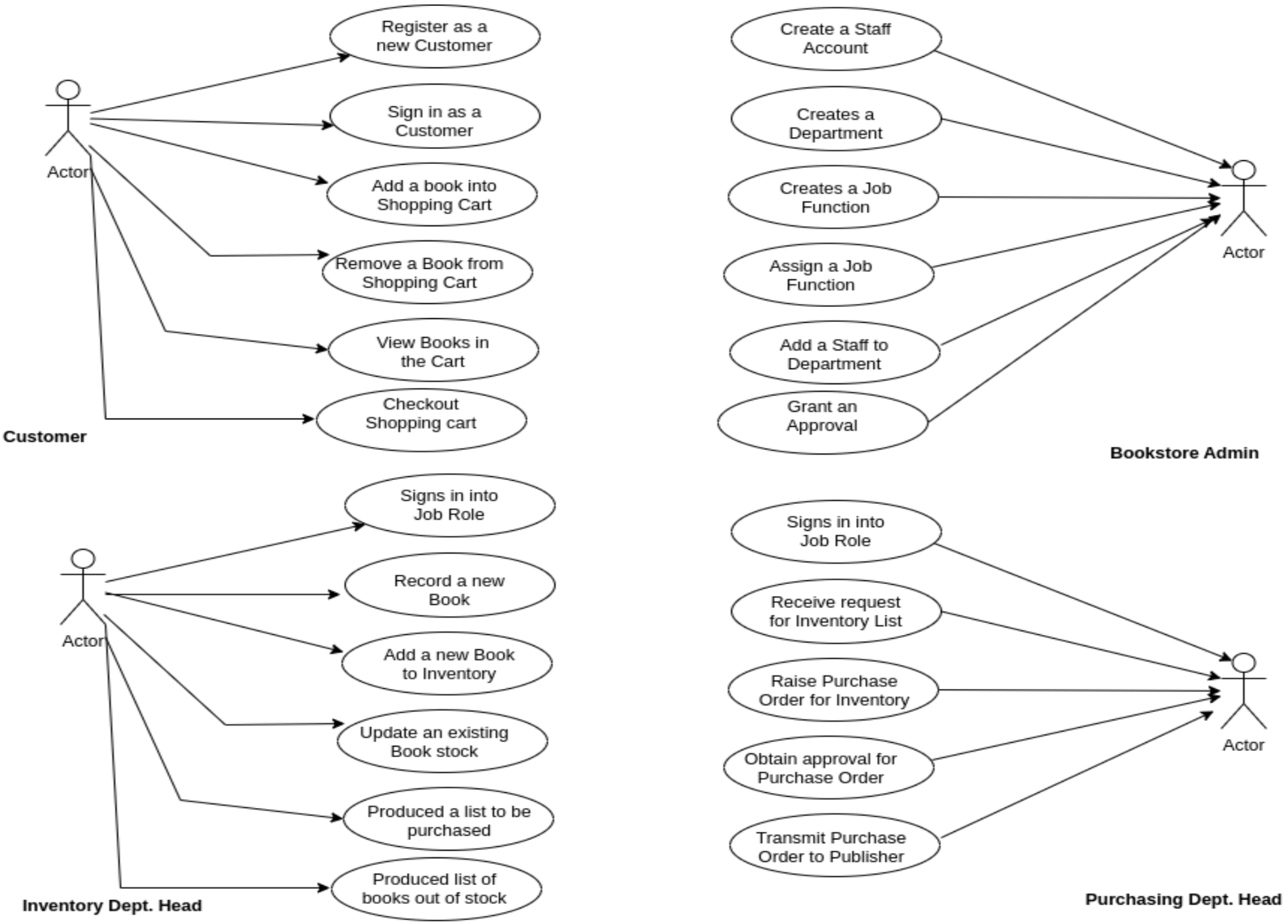


Figure 3 Use Case Diagram for Bookstore Online

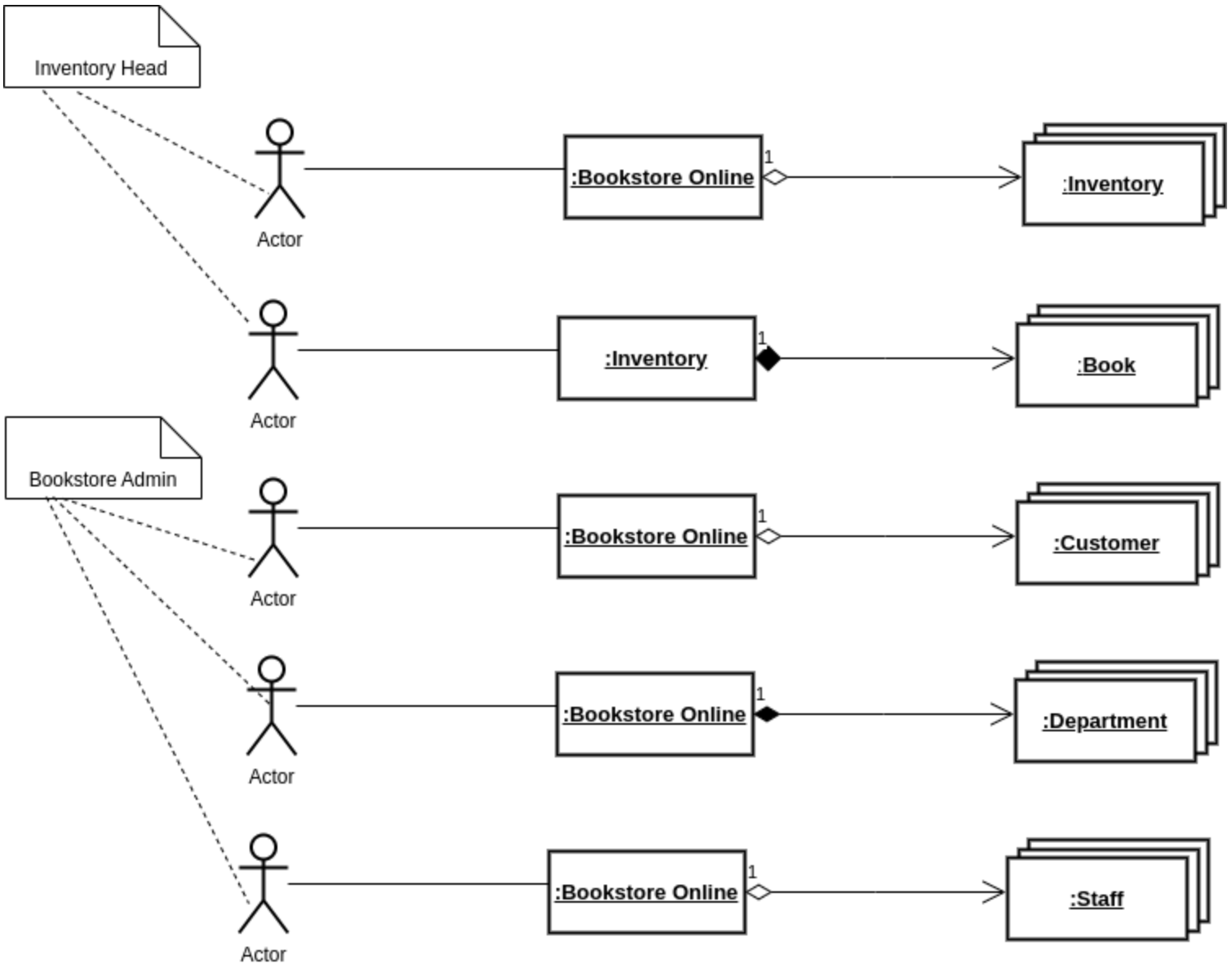


Figure 4: Object Diagrams of Bookstore Online

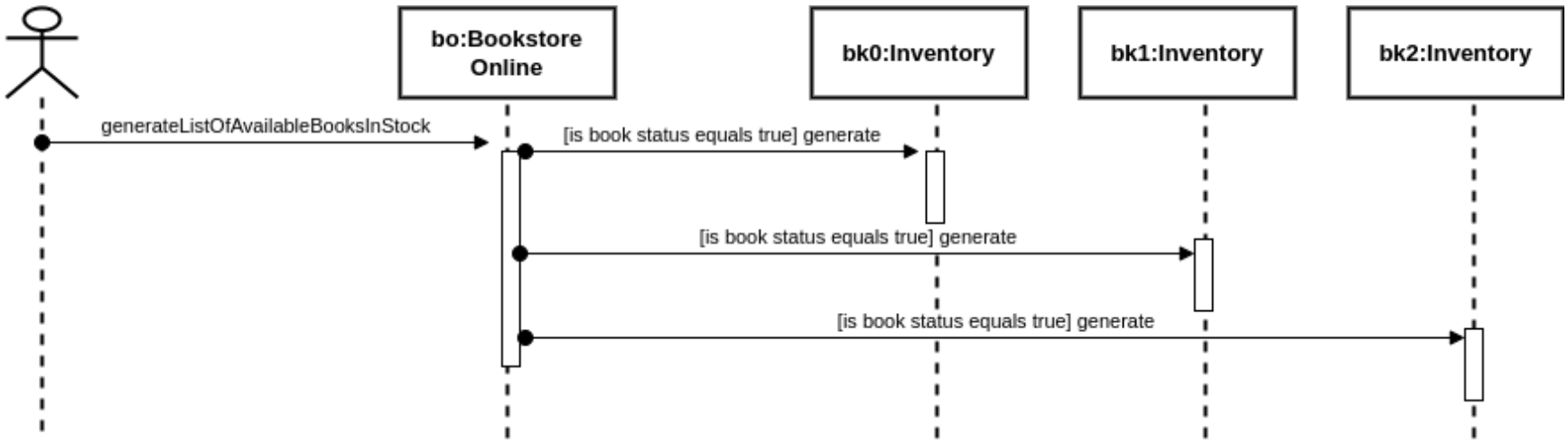
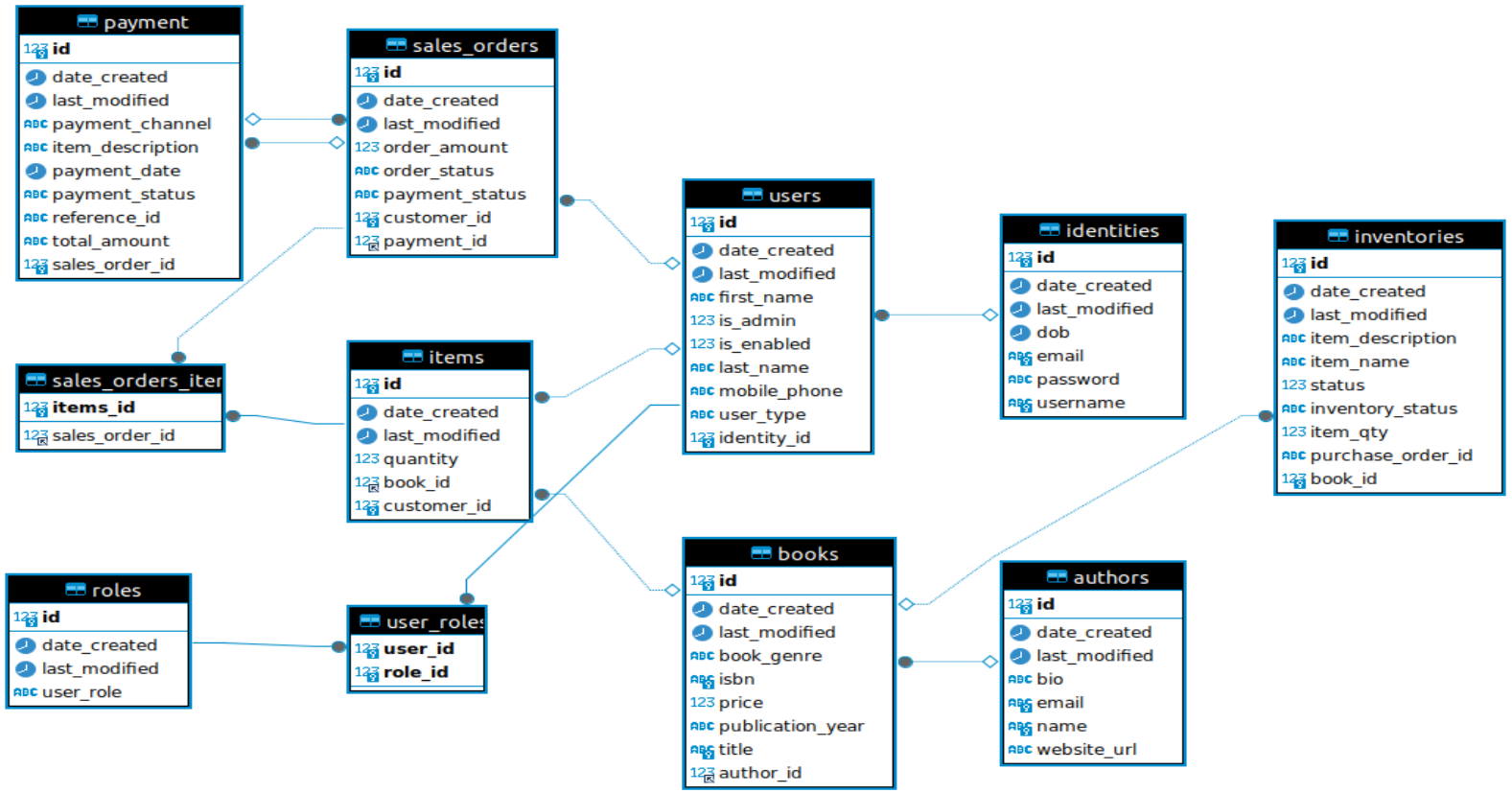


Figure 5: Sequence Diagram of the Produce List of Books iin Stock

Design

Entity Relationship Diagram (ERD)

The ERD models represent the entities, attributes and value types in the bookstore database schema design. The bookstore ERD below captures the characteristics of the Bookstore database such as Entity Identity, Relationship Constraints etc.:



Book: can be described with the following attributes;
Title (must contain only numbers and letters), Genre, it should be limited to Friction, Thriller, Mystery, Poetry, Horror, and Satire , ISBN code (must contain only numbers and dash(-)) , The Author. And the year of publication

Author: An entity that has a relationship with Books. Every Book is written by at least one Author. It can be described with the following attributes; Name, email, Bio, Website, Book

Inventory: entity whose function is for stocking books and tracking book sales, can be described as follows; Books, Purchase Order, Quantity, Status, Date Created, Description

Orders: are book sales transaction and can be described with the following attributes Book, Customer

Staff: are employees and have attributes; Name, StaffID. Email

Customer: users that purchase books online; Name, userID, Email