Logo

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ITC 6000

Database Management Systems

Final Project

Fall 2022 Term B

Online Bookstore

# Introduction:

The main goal of the online bookstore project is to build an online store that helps users select books based on genre, author, title, and price. Once the search is complete, the user can buy the book of their choice by completing the online payment process through a credit or debit card. The advantage of this store is that the user does not necessarily have to visit the store, which is time-consuming; instead, they can simply use the application at their preferred time and buy the book from any location. This application will also allow users to buy e-books. Additionally, it will also benefit shopkeepers. They can keep track of the inventory and restock the items as per the customer’s demand. Because customers will buy online, it becomes easy for the shopkeeper to handle inventory without a fuss.

# The application model:

This will be a freemium site, where people will just have to sign up with their email address or phone number and login to their account. The customers will be required to submit their personal details, such as name, phone number, email address, and delivery address. Once signed in, the customer can search for the book through various categories, add the final product to the shopping cart, and proceed to checkout. The order will be completed only when the payment is made through credit or debit information.

# Why I chose it:

I have chosen this project solely out of my personal interest. I am keen on reading different types of books. Sometimes I prefer eBooks, and sometimes I like reading physical books. Finding a good time to visit the store with a hectic schedule is the main problem. Hence, the online bookstore is a good option to tackle this problem. The books can be searched and bought at our own convenience, and then they will be delivered to the shipping address.

# End users of the application:

* The online application gives the reading enthusiasts an easy and simple way to buy the books. Through the application, the customer can browse the catalog anytime, anywhere, and can just click to buy when the order is final.
* A retail bookstore can have limited storage, which limits the reader's choices. An online database allows the shopkeeper to have millions of options, which in turn increases the exposure to all the stock they have.
* The readers can check the reviews, comments, and suggestions about the book before making the purchase, which will help them decide on whether to go for the read.

# Project includes following:

* Home Page: Once the user logs in, they will be redirected to the homepage. It will have book tiles, along with recommendations and hot selling books. It will also have a search bar to enter keywords.
* The search bar: The search bar will allow text entries, such as author, title, or genre.
* Advanced search: It will contain advanced searches such as sorting through price, updated date, and reviews.
* Book information: The readers would like to know the description of the book before they make the purchase. So, book information will include details of the book mentioned by the author.
* Shopping cart: This cart will contain the books that the user has selected. The cart summary will show the order value along with the items.
* Review: The users will also be able to submit their ratings and reviews of the book, which will allow other customers to read feedback about the book before they make the purchase.

# Business Rules

1. The customer will need to sign up or login to place an order.
2. An order can contain up to 8 items. In case the customer wishes to buy more items, another order must be created.
3. The order will be confirmed and shipped only when the payment is complete.
4. The payment can be done through debit or credit cards only.
5. Once the order is placed, the customer should receive an email with all the order details, such as items purchased, order value, shipping address, and estimated delivery time.
6. The store will deal only in new books.

# Personas

**User**

1. Can login to the app.
2. Can see the dashboard.
3. Can browse through all the book categories.
4. Can add books to the cart.
5. User can order the desired books by making the payment.
6. Can provide reviews and rating of the books.

**Seller**

1. Can login to the app.
2. Can see seller dashboard.
3. Seller can update or delete any item.
4. Seller can check the inventory.
5. Can accept or reject the order based on availability (in case of damaged products).

# Table design and Analysis

The project will have 6 tables. They are as below :

1. Customer – This table will have customer details like customer id, full name, username, address, city, state, zip code, phone number, email, and a foreign key order number. It is connected to book, order details and payment table. The customer searches for one or many books. Customer can place 0 or many orders. Customer can make 0 or many payments.
2. Order details – This table contains shipping address, order value, ship date and 3 foreign keys book id, customer id and transaction id. It is connected to customer, book and shipment table. An order will be connected to only 1 customer. Order details can contain 1 or many books. Order will be part of one and only 1 shipment.
3. Book – this table contains details about the books. The book can be stocked at 0 or many warehouses. The book can be part of 0 or many orders.
4. Payment – This table contains information about transaction made by the customer. The payment table will be connected to one customer.
5. Shipment – This table will contain information about the shipment details. The shipment will be part of one or many orders.
6. Warehouse – This table contains information about warehouse details. The warehouse can have 0 or many books.

# ERD

Diagram

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# SQL Queries

1. This query will retrieve information about the books available in warehouse 1. Warehouse id can be changed to check about books available in different warehouse.

Graphical user interface

Description automatically generated

Table

Description automatically generated

1. This query will display most ordered books.

Graphical user interface, text, application

Description automatically generated

Table

Description automatically generated

1. This query displays sum of order values of individual customers.

Graphical user interface, text, application

Description automatically generated

Table

Description automatically generated

# Analytics, reports and metrics

**User**

1. Number of users
2. Number of buyers
3. Number of books ordered

**Seller**

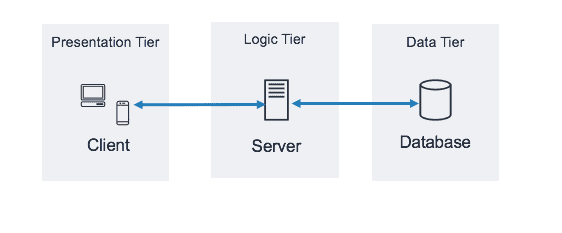
1. Number of books available
2. Number of shipments

# Security concerns

1. Customers’ Personal Identifiable Information needs to be protected.
2. Customers’ Payment Card Information needs to be protected.
3. Physical security for warehouses is required.

# Project Architecture

Below is the 3-tire architecture for my project:



1. Presentation layer: This layer is presented to the customers. It is the user interface and communication layer, where the client interacts with the website on the front end, and at the back end, the application collects and processes the data. The presentation layer can be developed in any of the programming languages such as HTML, javascript, or CSS.
2. The logic layer: Also called the business layer, is the center of the application. It uses specific business rules to gather and process the information. It can also add, delete, or update the information in the data layer. For instance, the business layer oversees tracking the user's preferences as they surf the website, view the books, and make the purchase. It will save the user's shipping and payment details, so when the user logs in the next time, they will not have to reenter the information.
3. Data layer: Also known as the database layer, this is the last layer where the data is stored, and the requests are processed. The data will be stored in NoSQL or SQL.

**What is the hosting model (in the cloud or local)?**

The hosting model used for online bookstore will be cloud hosting. Cloud hosting is completely scalable, we can add or remove resources any time and it is comparatively affordable.

**How much storage do you think you'll need?**

For the initial phase, the website will require 20 GB of bandwidth. The website will require 50 GB of monthly transfer considering there will be 5000 visitors per day.

# Learnings and next step

1. Learnt how to design the ERDs.
2. Learnt how to insert the data into database.
3. Joined multiple tables and used select statements.
4. For the next step I would improve my ERD.
5. Will use more complex select statements.