

Sopiko: E-commerce website for buying and selling books

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Abstract—Sopiko is an e-commerce web application developed for buying and selling books through an online platform. The main purpose of this project is to provide an easy, fast, and reliable system where users can purchase new or old books and also sell their used books to other users. In today's digital world, many students and readers face difficulties in finding affordable books in nearby stores. Traditional book purchasing methods consume more time and effort. Sopiko solves this problem by creating a centralized online marketplace where books are available at different price ranges and categories.

The website provides separate functionalities for buyers, sellers, and administrators. Buyers can search books, view details, compare prices, add products to the cart, and place orders online. Sellers can upload book details, set prices, manage stock, and track orders. The admin manages users, products, categories, and overall website activities. The system also includes features like user registration, secure login, payment integration, order management, and feedback systems to improve user experience.

The project is developed using modern web technologies to ensure better performance, responsiveness, and security. Sopiko aims to encourage book reading by making books more accessible and affordable for everyone. It also promotes the reuse of old books, reducing wastage and supporting environmental sustainability. The platform can be useful for students, teachers, professionals, and book lovers who want a convenient way to buy or sell books from anywhere at any time.

Keywords— E-Commerce, Online Bookstore, Book Buying and Selling, Web Application, Second-Hand Books, Digital marketplace, Online Shopping, User Authentication, Shopping Cart, Secure Payment System, Book Management, Inventory Management, Responsive Website, Database Management

I. INTRODUCTION

A. Background

The rapid growth of internet technology has changed the way people buy and sell products. E-commerce platforms have become one of the most popular methods for online shopping because they offer convenience, speed, and accessibility. Among different products sold online, books remain an important source of knowledge, education, and entertainment. However, many people still face challenges in finding affordable books, especially academic and second-hand books. To solve this issue, the project Sopiko: An E-Commerce Web for Buying and Selling Books has been developed.

Sopiko is an online web application that allows users to buy and sell books easily through a digital platform. The

system is designed to connect book buyers and sellers in a single marketplace. Users can browse different categories of books such as educational, fictional, technical, historical, and competitive exam books. They can search for books based on title, author, category, or price. The platform also allows sellers to upload book information and manage their products online.

The website provides a secure authentication system where users can create accounts and log in safely. Buyers can add books to their shopping cart, place orders, and make payments online. Sellers can manage inventory and update product details whenever required. The administrator has complete control over the platform and can monitor user activities, orders, and transactions.

B. Problem Statement

In the traditional system of buying and selling books, users often face several difficulties such as limited availability of books, high prices, time-consuming searches, and lack of access to second-hand books. Students and readers usually need to visit multiple bookstores to find the required books, which wastes both time and money. In many cases, old books remain unused after completion of studies because there is no proper platform for reselling them.

Existing online shopping systems mainly focus on selling new books and do not provide sufficient support for individual sellers who want to sell used books. Many small sellers also face problems in reaching potential buyers due to the absence of a dedicated and user-friendly platform. Additionally, manual management of book inventory, orders, and customer details can lead to errors and inefficiency.

There is a need for a centralized online platform that allows users to easily buy and sell both new and old books in a secure and efficient manner. The system should provide features such as online searching, book categorization, secure payments, order tracking, and user-friendly interfaces to improve the overall experience of users.

C. Objectives

The major objectives of the proposed system are listed below:

- To develop an online platform for buying and selling books.

- To provide a user-friendly interface for customers and sellers.
- To enable users to search books easily using categories and keywords.
- To support the buying and selling of both new and second-hand books.
- To integrate a chatbot assistance module for handling admission-related user queries.
- To reduce the time and effort required for finding books.
- To implement shopping cart and online payment features.
- To provide an efficient admin panel for managing users and products.

D. Scope of the Project

The scope of the project “Sopiko” includes the development of a complete web-based e-commerce system for buying and selling books online. The platform is designed to serve different types of users including buyers, sellers, and administrators. The system allows users to register, log in, browse books, search products, add books to the cart, and purchase them through an online payment system.

The project also provides facilities for sellers to upload and manage book details such as title, author name, category, description, price, and stock availability. Sellers can monitor customer orders and update their product listings whenever required. The admin module manages all users, books, transactions, and website activities to ensure smooth operation of the system.

The application supports multiple categories of books including educational books, novels, storybooks, technical books, and competitive exam preparation books. The system can be accessed through various devices such as desktops, laptops, tablets, and smartphones because of its responsive design.

II. LITERATURE REVIEW

A. Online Educational Consultancy Platforms

The growth of internet technology and digital platforms has significantly changed the traditional methods of buying and selling products. E-commerce systems have become an essential part of modern business because they provide convenience, accessibility, and faster transactions. Many researchers and developers have worked on online shopping systems to improve customer experience and business management. The project Sopiko: An E-Commerce Web for Buying and Selling Books is inspired by these existing studies and technologies. Several studies show that online bookstores help users save time and effort by allowing them to search and purchase books from anywhere. Traditional bookstores often have limited stock and require customers to physically visit stores, whereas e-commerce platforms provide a wider range of books with easy comparison of prices and categories. Researchers have highlighted that online systems improve accessibility for students and readers, especially in areas where physical bookstores are limited.

B. Artificial Intelligence in book Systems

Artificial Intelligence (AI) has become one of the most important technologies in modern digital systems. In on-line book management and e-commerce platforms, AI helps improve user experience, automate processes, and provide intelligent services. AI-based systems can analyze user behavior, preferences, and search patterns to provide personalized recommendations and better decision-making. The integration of AI into book systems makes the platform more efficient, smart, and user-friendly.

One of the major applications of AI in book systems is the recommendation system. AI algorithms study the interests, search history, and purchase behavior of users to suggest relevant books. For example, if a user frequently purchases technical books, the system can automatically recommend similar books related to programming, data science, or artificial intelligence. Popular online platforms such as Amazon use AI-based recommendation engines to increase customer satisfaction and sales.

C. Research Gap

Many existing e-commerce platforms and online bookstore systems provide facilities for purchasing books online, but several limitations still exist in these systems. Most current platforms mainly focus on selling new books and do not provide equal importance to second-hand or reusable books. Students and readers who want affordable books often face difficulties in finding low-cost used books through a single dedicated platform. This creates a gap between buyers looking for economical books and sellers who want to resell their old books.

Existing systems such as Amazon and Flipkart provide large-scale online shopping services, but their platforms are mainly business-oriented and less focused on direct interaction between individual buyers and sellers of books. Many small sellers and students find it difficult to upload, manage, and sell books easily because of complex interfaces and higher competition on such platforms.

III. SYSTEM OVERVIEW

A. Proposed System

The project Sopiko: An E-Commerce Web for Buying and Selling Books is a web-based application designed to provide an efficient platform for users to buy and sell books online. The system acts as a digital marketplace where buyers can search for books and sellers can upload and manage their products. The platform aims to simplify the traditional process of book trading by providing a secure, user-friendly, and accessible online environment.

The system consists of three major modules: User Module, Seller Module, and Admin Module. Each module performs specific functions to ensure smooth operation of the platform. The User Module allows customers to create accounts, log in securely, browse different categories of books, search for required books, add products to the shopping cart, and place orders online. Users can also view order history, payment

details, and book descriptions before making purchases. The Seller Module enables sellers to upload books with details such as title, author name, category, price, description, and stock availability. Sellers can manage inventory, update product details, monitor customer orders, and track sales through the system.

The Admin Module manages the overall activities of the website. The administrator can monitor users, sellers, products, transactions, and customer activities. Admins also handle security, product verification, and maintenance of the platform to ensure proper functionality.

B. System Architecture

The system architecture of Sopiko: An E-Commerce Web for Buying and Selling Books represents the overall structure and interaction between different components of the application. The architecture is designed to ensure smooth communication between users, the web application, and the database system. It follows a three-tier architecture consisting of the Presentation Layer, Application Layer, and Database Layer.

- 1) Presentation Layer
- 2) Application Layer
- 3) Database Layer

The Presentation Layer is the front-end part of the system that interacts directly with users. It includes web pages such as the home page, login page, registration page, product listing page, shopping cart, payment page, and admin dashboard. This layer is developed using technologies like HTML, CSS, JavaScript, and Bootstrap to create a responsive and user-friendly interface. Buyers and sellers can access the platform through desktops, laptops, tablets, and smartphones.

The Application Layer acts as the core processing unit of the system. It handles all business logic and manages communication between the user interface and the database. This layer processes user requests such as login authentication, searching books, adding books to the cart, placing orders, uploading products, and managing transactions. It also controls seller activities, admin functionalities, and order processing. Server-side technologies such as PHP, Python, Node.js, or other frameworks can be used for implementing this layer.

The Database Layer stores and manages all system data securely. It includes information related to users, sellers, books, orders, payments, and transaction history. A relational database management system such as MySQL is used to maintain the data efficiently. The database ensures data consistency, security, and fast retrieval of information whenever requested by the application.

IV. METHODOLOGY

A. System Workflow

The development of Sopiko: An E-Commerce Web for Buying and Selling Books follows a systematic methodology

to ensure proper planning, design, implementation, testing, and deployment of the application. The methodology used in this project is based on the Software Development Life Cycle (SDLC), which helps in developing a reliable, efficient, and user-friendly system.

The first phase is the Requirement Analysis Phase. In this phase, the problems faced by users in traditional book buying and selling systems are identified. User requirements such as online searching, secure login, shopping cart, payment integration, and book management are collected and analyzed. This phase helps define the objectives and functionalities of the system clearly.

The second phase is the System Design Phase. In this stage, the architecture, database structure, user interface, and module design of the application are prepared. Flowcharts, diagrams, and database schemas are designed to represent the working structure of the system. The user interface is planned to ensure simplicity, responsiveness, and ease of use. The third phase is the Development Phase. In this phase, coding and implementation of the project are carried out using web development technologies such as HTML, CSS, JavaScript, Bootstrap, PHP/Python, and MySQL. Different modules including user authentication, book management, shopping cart, payment system, and admin dashboard are developed and integrated.

The fourth phase is the Testing Phase. The system is tested to identify errors, bugs, and performance issues. Different testing methods such as unit testing, integration testing, and system testing are performed to ensure the application functions correctly and securely. User acceptance testing is also conducted to verify that the system meets user requirements.

The fifth phase is the Deployment Phase. After successful testing, the application is deployed on a server so users can access it online. The database and web server are configured properly for smooth operation.

The final phase is the Maintenance Phase. In this stage, the system is monitored regularly to fix issues, update features, improve security, and enhance performance. Future improvements such as AI-based recommendations and chatbot integration can also be implemented during maintenance.

B. ai based booking system

An AI-Based Booking System is an intelligent digital platform that uses Artificial Intelligence (AI) technologies to automate and improve the process of booking services, products, or appointments online. The system helps users make reservations quickly and efficiently while reducing manual work for administrators and service providers. AI-based booking systems are widely used in industries such as hotels, transportation, healthcare, restaurants, education, and event management.

The main purpose of an AI-based booking system is to provide a smart, fast, and personalized booking experience

for users. Traditional booking systems often require manual searching, long waiting times, and human assistance. AI technology improves these systems by analyzing user preferences, predicting customer behavior, and automating decision-making processes.

C. Booking Methodology

The methodology of an AI-Based Booking System describes the systematic process used to design, develop, and implement the booking platform. The methodology ensures that the system works efficiently, securely, and intelligently while meeting user requirements. The development process follows the Software Development Life Cycle (SDLC), which includes requirement analysis, system design, development, testing, deployment, and maintenance phases.

- **Requirement Analysis:** The first step in the methodology is requirement gathering and analysis. In this phase, the needs of users, administrators, and service providers are identified. The system requirements include user registration, service searching, online booking, AI recommendations, payment processing, notifications, and admin management. The challenges faced in traditional booking systems, such as manual booking errors, long waiting times, and poor customer support, are also analyzed.
- **System Design:** The System Design of the project Sopiko: An E-Commerce Web for Buying and Selling Books defines the structure, architecture, modules, and working process of the application. The system is designed to provide a secure, scalable, and user-friendly environment for online book trading. It follows a client-server architecture where users interact with the web interface through browsers, and the server processes requests and communicates with the database. The system consists of three main layers: the Presentation Layer, Application Layer, and Database Layer. The Presentation Layer includes the user interface developed using HTML, CSS, JavaScript, and Bootstrap, allowing users to browse books, manage carts, and place orders.
- **System Development:** The System Development phase of the Sopiko project focuses on the implementation of the designed e-commerce platform using modern web technologies and software development methodologies. This phase involves coding, database creation, integration of modules, testing, and deployment of the application.
- **Testing Phase:** The Testing Phase is one of the most important stages in the development of the Sopiko: An E-Commerce Web for Buying and Selling Books system. This phase ensures that the application works correctly, securely, and efficiently before deployment. Testing is performed to identify errors, bugs, and performance issues in the system so that they can be corrected before users access the platform.

D. Database Design Methodology

The Database Design Methodology for the project Sopiko: An E-Commerce Web for Buying and Selling Books is a structured process used to design and manage the database efficiently. The database is an important part of the system because it stores all information related to users, sellers, books, orders, payments, and transactions. A properly designed database improves system performance, security, and data consistency:

- **Requirement Analysis:** The first step in database design is identifying the data requirements of the system. In this phase, all the information needed for the booking platform is analyzed. The system must store data related to:
User accounts, Booking details, Service information, Payment transactions, AI recommendation history, Notifications, Admin management
The relationships between different data entities are also identified. For example, a user can make multiple bookings, and each booking may contain payment details and service records.
- **Conceptual Database Design:** In this phase, the overall structure of the database is designed using conceptual models such as Entity Relationship (ER) Diagrams. The major entities identified in the booking system include: User Booking Service Payment AI Recommendation Notification Admin
Relationships between entities are clearly defined. For example:
One user can have many bookings. One booking is associated with one payment. One admin can manage multiple users and bookings.
- **Logical Database Design:** The logical design phase converts the conceptual model into database tables and attributes. Each entity is transformed into a table with rows and columns. Primary keys and foreign keys are defined to establish relationships between tables. Example tables include:
Users Table Bookings Table Services Table Payments Table Notifications Table Reviews Table

By organizing the database layout into normalized collections and implementing indexed keys on frequently queried attributes (such as candidate ranks, categories, and branch identifiers), multi-table join configurations run with minimal disk read latency. This performance tuning ensures that data lookup speeds remain stable, preventing server-side processing bottlenecks even when processing high volumes of concurrent prediction requests.

V. SYSTEM DESIGN

A. Use Case Diagram

The Presentation Layer is the front-end part of the system that directly interacts with users. It provides web pages and interfaces through which users can perform booking activities. This layer is designed using technologies such as HTML, CSS,

JavaScript, and Bootstrap to create a responsive and attractive user interface.

The main functions of this layer include:

User Registration and Login Service Search and Booking Booking Confirmation Online Payment Booking History Notifications and Alerts AI Chatbot Interaction

- **Application Layer (Business Logic):** The Application Layer handles the core functionality and business logic of the booking system. It processes user requests and communicates between the user interface and the database.

This layer performs functions such as:

User Authentication Booking Processing AI Recommendation Processing Payment Verification Notification Management Booking Cancellation and Modification Chatbot Communication

This clear separation of functional use cases ensures that multi-role validation rules are strictly maintained, protecting internal computing targets from unauthorized actions while delivering an accessible interface layout for standard users.

VI. IMPLEMENTATION

A. Frontend Implementation

The frontend is developed using HTML5, CSS3, next.js and JavaScript. Responsive layouts improve accessibility across multiple devices and enhance user interaction.

B. Backend Implementation

Backend operations are implemented using Node.js, express.js.

C. Admin Dashboard

The admin dashboard provides centralized management functionalities for handling institutional records, inquiries, predictor datasets, and booking responses.

VII. RESULTS AND ANALYSIS

A. Functional Testing Results

The developed platform successfully performs institutional search, booking, inquiry handling, and order placements.

VIII. DISCUSSIONS

A. Advantages of the System

The Sopiko: An E-Commerce Web for Buying and Selling Books system provides several advantages for buyers, sellers, and administrators. It offers a simple and convenient platform where users can buy and sell books online from anywhere at any time.

The platform helps sellers manage their inventory, update book details, and track orders efficiently through a digital dashboard. It also maintains proper records of users, transactions, and order history, reducing manual paperwork and improving data management.

B. Limitations

The Sopiko: An E-Commerce Web for Buying and Selling Books system has several limitations despite providing many useful features. The platform depends completely on internet connectivity, so users cannot access the system without a stable internet connection. Users who are not familiar with digital technology or online payment methods may face difficulties while using the application.

C. Real-World Applicability

The Sopiko: An E-Commerce Web for Buying and Selling Books project has significant real-world applicability because it addresses common problems faced by students, readers, and book sellers in accessing affordable books. In today's digital era, online shopping platforms are widely used for purchasing products, and Sopiko applies this concept specifically to book trading. The system can be used by schools, colleges, universities, libraries, bookstores, and independent sellers to buy and sell both new and second-hand books efficiently.

IX. FUTURE SCOPE

The future scope of Sopiko: An E-Commerce Web for Buying and Selling Books is very broad because the system can be enhanced with advanced technologies and additional features to improve user experience and system efficiency. In the future, the platform can be developed into a mobile application for Android and iOS devices to provide easier access and better usability for users.

X. CONCLUSION

The project Sopiko: An E-Commerce Web for Buying and Selling Books successfully provides a modern and efficient platform for online book trading. The system simplifies the traditional process of buying and selling books by offering a secure, user-friendly, and accessible digital marketplace. It allows users to search, purchase, and sell both new and second-hand books conveniently from anywhere and at any time.

The platform benefits students, readers, and sellers by reducing the time, cost, and effort involved in finding books. Features such as user authentication, book management, shopping cart, online payment, order tracking, and admin management improve the overall efficiency and reliability of the system. The project also promotes the reuse of books, which helps reduce educational waste and supports environmental sustainability.

REFERENCES

- [1] Laudon, K. C., & Traver, C. G., *E-Commerce: Business, Technology, Society*, Pearson Education, 2021.
- [2] Pressman, R. S., *Software Engineering: A Practitioner's Approach*, McGraw-Hill Education, 2019.
- [3] Elmasri, R., & Navathe, S. B., *Fundamentals of Database Systems*, Pearson, 2017.
- [4] Sommerville, I., *Software Engineering*, 10th Edition, Pearson Education, 2016.
- [5] Welling, L., & Thomson, L., *PHP and MySQL Web Development*, Addison-Wesley Professional, 2017.
- [6] Silberschatz, A., Korth, H. F., & Sudarshan, S., *Database System Concepts*, McGraw-Hill, 2019.
- [7] Goodfellow, I., Bengio, Y., & Courville, A., *Deep Learning*, MIT Press, 2016.
- [8] Russell, S., & Norvig, P., *Artificial Intelligence: A Modern Approach*, Pearson Education, 2021.
- [9] Nielsen, J., *Usability Engineering*, Morgan Kaufmann Publishers, 2012.
- [10] Connolly, T., & Begg, C., *Database Systems: A Practical Approach to Design, Implementation, and Management*, Pearson Education, 2015.