SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTATIONAL INTELLIGENCE(21CSC203P)

SECURED E-COMMERCE SHOPPING

UNDER THE GUIDANCE OF
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ABSTRACT

The E-Commerce Shopping Cart System is a Java-based desktop application designed to streamline the online shopping experience through a responsive and intuitive user interface. Developed using Java Swing and AWT, the application provides core functionalities such as secure user authentication, product browsing with visual representation, shopping cart management, and a seamless checkout process. Users can log in to their accounts, explore a catalog of products, add or remove items from their cart, and view the total cost before finalizing purchases. The system ensures smooth navigation across modules, prioritizes user experience, and presents an organized layout that enhances usability. This project demonstrates the effective use of Java's GUI capabilities to create a visually engaging and functionally complete shopping application suitable for desktop environments.

REQUIREMENTS

With the increase in online shopping, e-commerce platforms have become a necessity for modern businesses and consumers. This project, E-commerce Shopping Cart is a standalone Java application that offers users a simulated online shopping experience. It allows users to browse available products, add them to a shopping cart, and complete a secure checkout International Journal of Engineering Science and Advanced Technology (IJESAT) Vol 25 Issue 05, MAY, 2025 ISSN No: 2250-3676 www.ijesat.com Page 71 of 81 process. In addition, the system generates invoices for purchased items, ensuring a smooth transaction experience. The project is designed using Java Swing and AWT for designing an interactive graphical user interface (GUI). ArrayList are used for efficient management of products and cart. It also has simple user authentication for personalizing the shopping experience. The main functions include product listing, cart operations (add or remove items), total bill generation, and generating an invoice. This project aims at demonstrating core functionalities of e-commerce while building or enhancing one's Java programming. This project applies real-world concepts such as OOP, data structures, and GUI development that make it very practical. A user-friendly shopping cart system provided by E-commerce Shopping Cart provides key features in a way to let students understand and know how to work on platforms for online shopping at the bottom level and hence is quite a useful project for both learners and developers studying Java.

LITERATURE SURVEY

S.no	Title	Authors	Year	Methodology	Key Findings	Limitations

1) **D. Bhargava & P. Mishra** – *Designing an Expert System for Online Shopping Cart Management*: This study proposed a rule-based expert system to automate and optimize online shopping cart management, improving user satisfaction and efficiency.

2) **C. S. Horstmann & G. Cornell** – *Core Java Volume I – Fundamentals (11th ed.)*: This book provides core Java programming concepts essential for building robust and scalable backend systems for e-commerce applications.

3) **N. Tripathi, D. Vartak & H. Chaudhari **–*Estimating Frequent Products in Shopping Cart Using Data Mining*: The study applied association rule mining to identify frequently purchased items, aiding in the development of more effective recommendation system

4) **S. Ahmed & P. Ko**– *An Enhanced Recommendation Technique for Personalized ECommerce Portal*: Proposed a recommendation method using user profiles and historical data to improve the relevance of product suggestions in e-commerce portals.

5) **S. Tyagi, S. Yadav, U. Singhal & H. Chaudhary** – *Analysis and Development of ECommerce Web Application*: Focused on the technical and functional aspects of ecommerce web development, highlighting the importance of secure, scalable, and userfriendly interfaces.

6) R. Agrawal & R. Srikant – *Fast Algorithms for Mining Association Rules*: Introduced efficient algorithms for discovering associations between items in large databases, forming the foundation for modern product recommendation and shopping cart analysis.

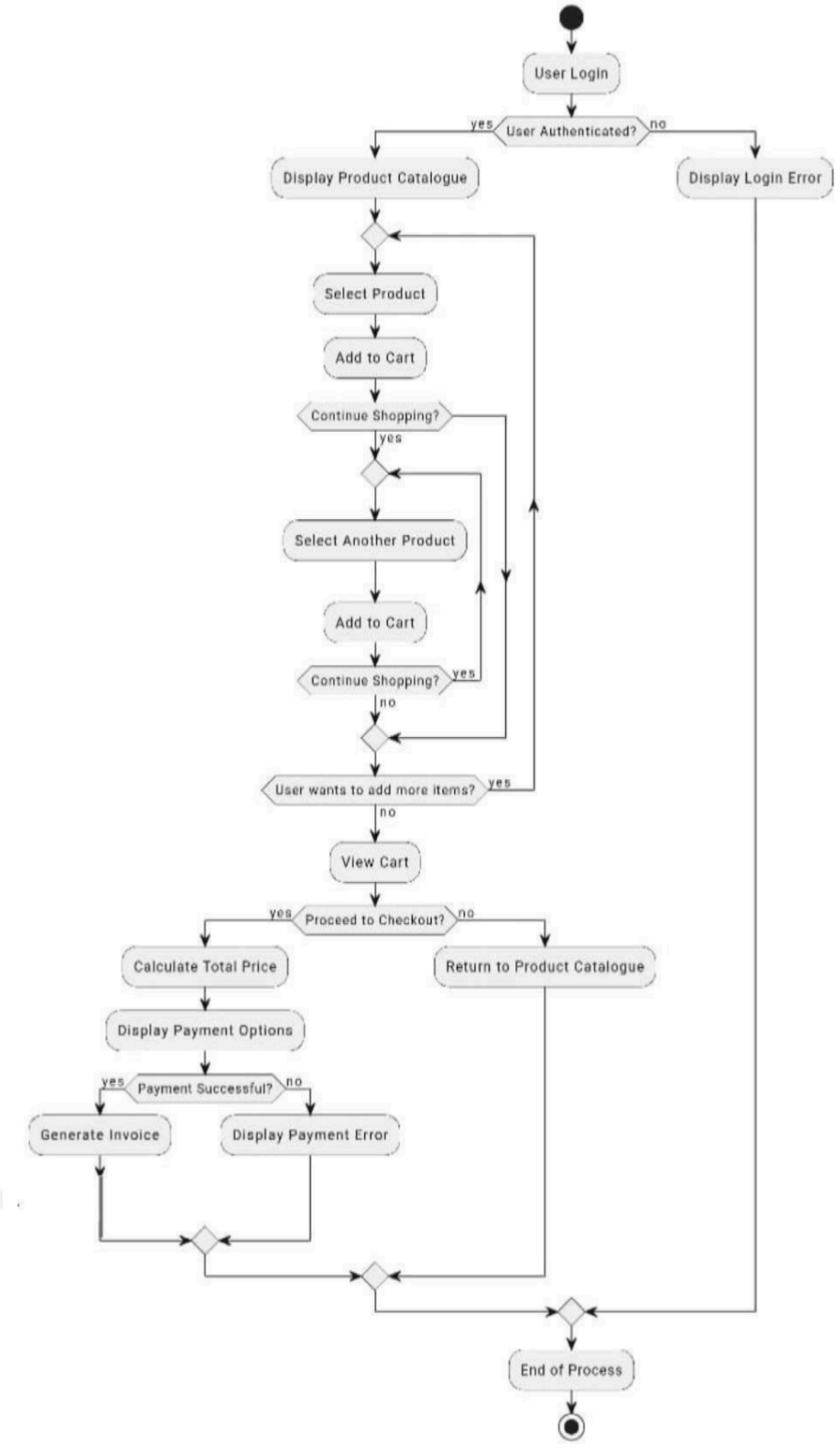
7) D. C. Montgomery, G. C. Runger & N. F. Hubele – *Engineering Statistics*: Provides statistical methods widely applied in e-commerce analytics, demand forecasting, and performance evaluation of online retail systems.

8) P. Resnick & H. R. Varian – *Recommender Systems*: Pioneered collaborative filtering approaches, which are now core techniques in personalized e-commerce recommendation engines.

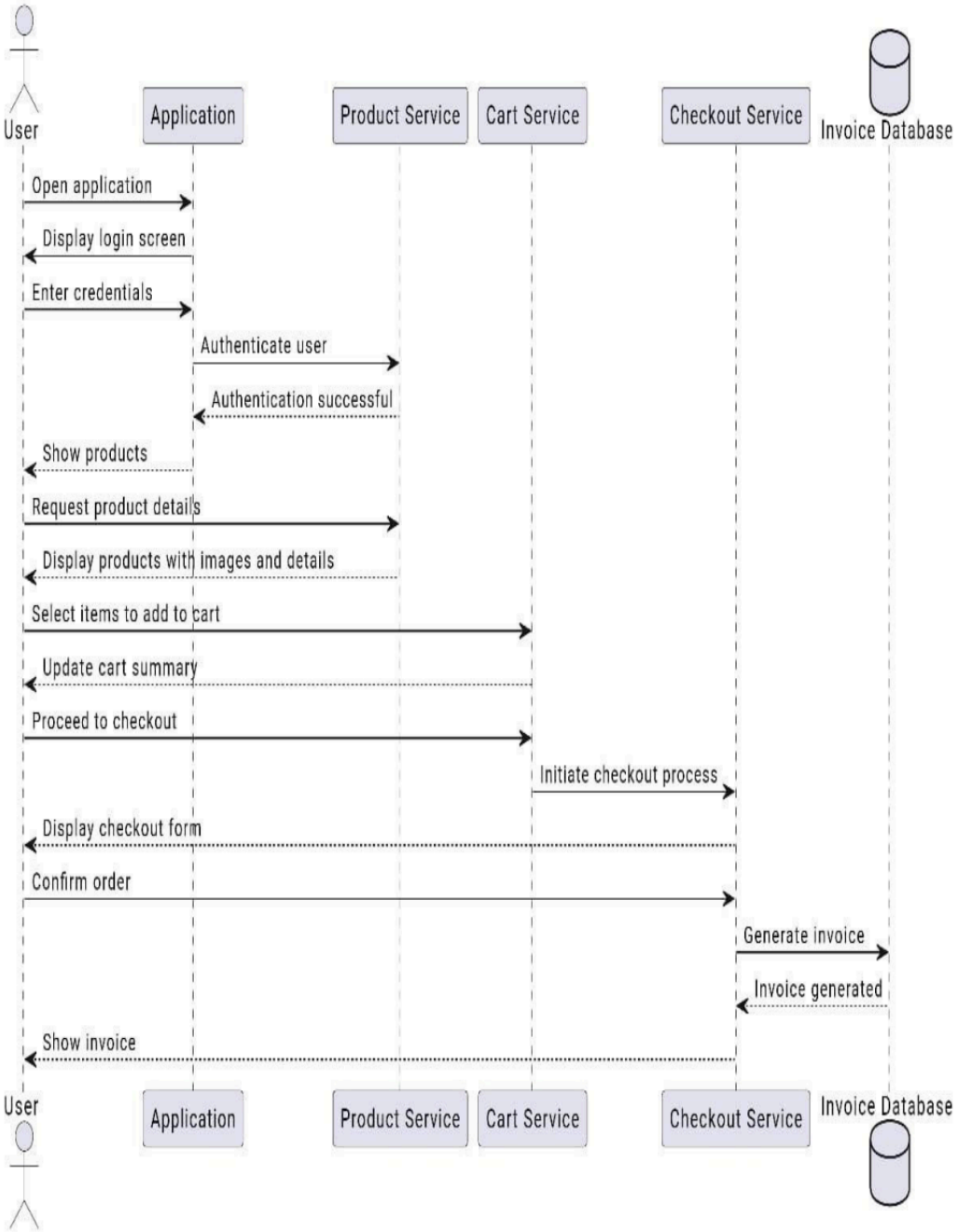
9) S. K. Singh & R. S. Rajput – *E-Commerce Security: Threats and Solutions*: Discussed common security threats in online transactions and presented frameworks for secure payment gateways and encrypted data storage.

10) M. P. Papazoglou & W. J. van den Heuvel – *Service Oriented Architecture: Approaches and Applications in E-Commerce*: Analyzed how SOA principles enhance modularity, scalability, and integration in large e-commerce systems.

USE CASE DIAGRAM



CLASS DIAGRAM



WORK FLOW

The proposed e-commerce shopping cart system is designed using a modular layered architecture. The system is divided into three primary modules:

- Built using Java Swing and AWT, providing a desktop-based graphical environment.
- Facilitates product browsing, search, and filtering.
- Enables cart management operations such as *adding items, removing items, updating quantities*.
- Provides a checkout screen for order confirmation.
- Ensures a user-friendly and interactive experience.

- Handles user registration, login, and logout processes.
- Stores and validates credentials using a secure local database.
- Maintains session state for active users to ensure secure transactions.
- Implements password hashing and verification for secure access.

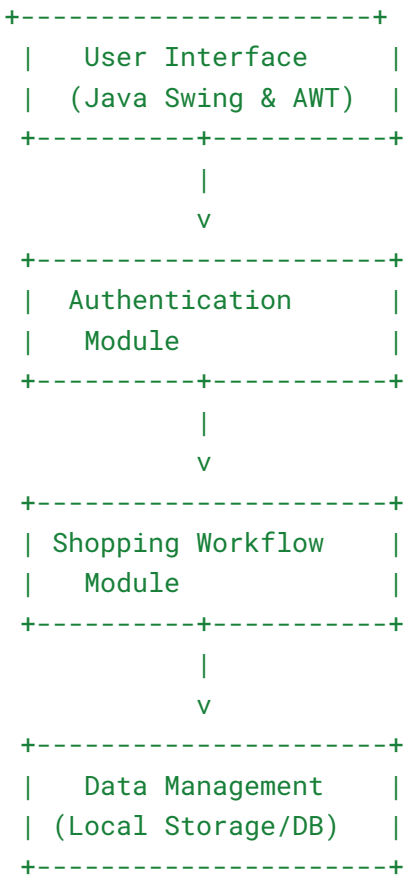
- Manages product listing, cart operations, order processing, and invoice generation.
- Coordinates with the UI module for smooth navigation between browsing and checkout.
- Implements backend business logic, including price calculation, tax computation, and order summary.
- Stores order history locally for retrieval and tracking.

- A local storage system (file-based or lightweight database) maintains:
    - User data and session states
    - Product details and availability

Acts as the backbone for data persistence and retrieval.

1. The user interacts with the UI Module.
2. Authentication is verified by the Authentication Module.
3. On successful login, the Shopping Workflow Module fetches products from the database.
4. The cart and checkout process are managed through the workflow logic.
5. The system generates an invoice and updates the local storage.

Architecture Diagram



This layered diagram shows top-to-bottom flow, where the UI interacts with Authentication and Workflow modules, and all modules rely on the Data Management Layer for storage and retrieval.

MODULES

The proposed system is a standalone desktop application that does not require internet connectivity, providing a seamless shopping experience even in areas with unstable internet access. It features secure login authentication to prevent unauthorized access and enhance security. The shopping cart module allows users to add, remove, and modify items efficiently using an ArrayList. Additionally, the system generates detailed invoices after each purchase, including product details, quantities, prices, and applicable taxes or discounts, ensuring transparency. Overall, the system addresses the limitations of traditional shopping by offering enhanced security, efficiency, and offline accessibility.

MODULES USED

1. User Login & Authentication Module o Handles user registration and login o Input validation and error handling

2. Product Display Module o Product catalog interface o Product details and images

3. Shopping Cart Module o Add/remove products o View cart summary and total

4. Checkout Module o Order confirmation o Invoice generation

TECHNOLOGIES USED Programming Language: Java Tools: Eclipse Database: File-based storage (for invoices and logs) Operating System: Windows 10 Processor:

Intel Core i5 SYSTEM ADVANTAGES

• Secure user authentication through a robust login module • Interactive and user-friendly Java Swing/AWT interface

• Smooth navigation between shopping, cart, and checkout modules

• Visually appealing product display with images and details • Standalone desktop application requiring no browser or internet dependency

• Automatic invoice generation for completed transactions

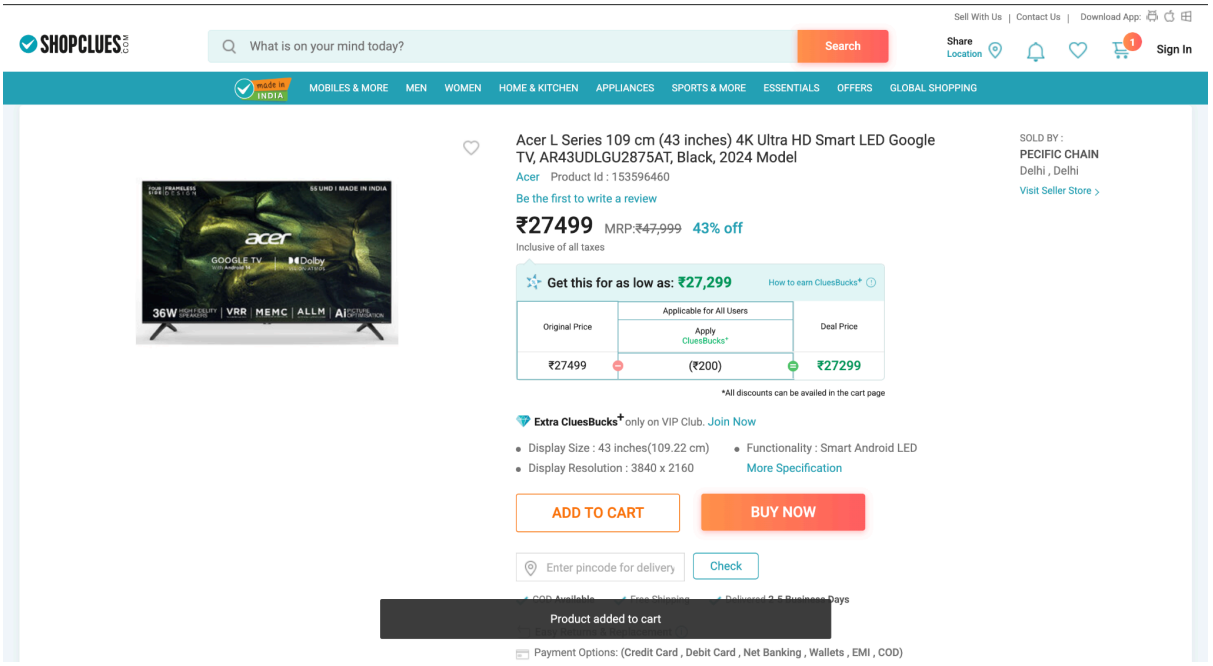
Advantages Of Proposed System

➢ The standalone desktop application ensures seamless operation without dependency on the internet, providing a smooth and uninterrupted shopping experience.

➢ Secure login authentication strengthens user data protection, ensuring that only authorized users can access and make transactions, thereby preventing unauthorized access and protecting sensitive information.

➢ The shopping cart system offers a user-friendly interface for customers to add, remove, and manage their selected items, leading to enhanced convenience and ease of use.

➢ Invoice generation provides a clear and professional order summary, allowing users to easily review their purchase details and enhancing the overall user experience with a transparent transaction record.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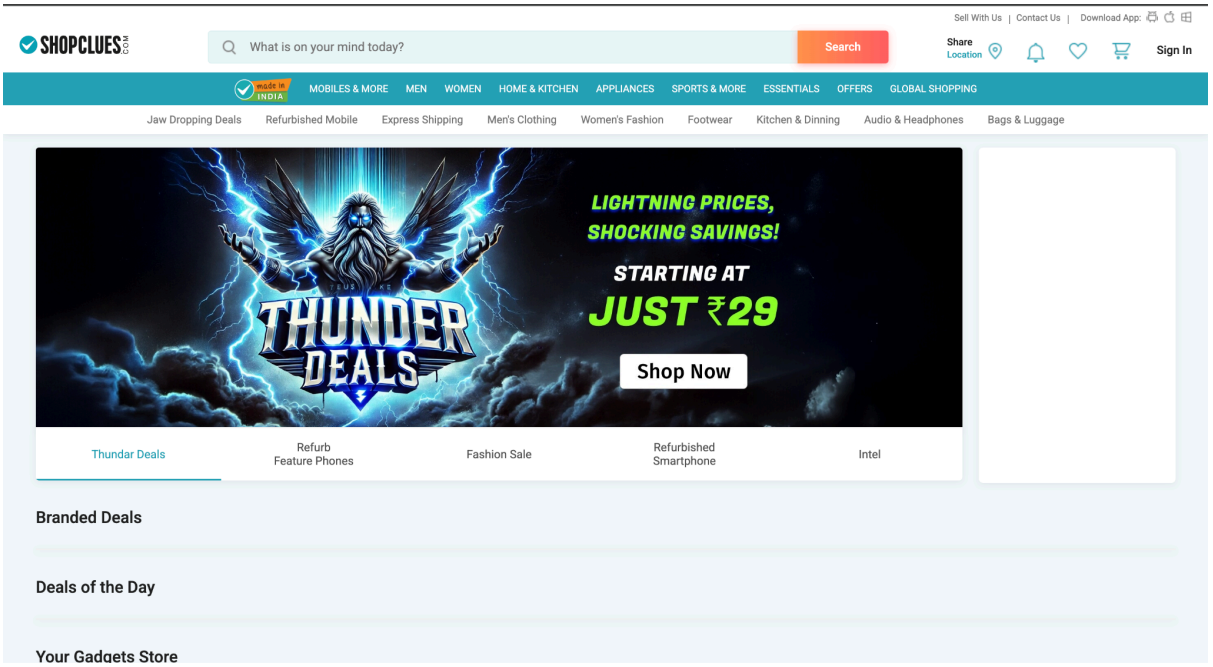
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REFRENCES

[1] D. Bhargava et al. (2019). Designing an Expert System for Online Shopping Cart Management.

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[5] R. A. E.-D. Ahmed et al. (2015). Performance study of classification algorithms for consumer online shopping attitudes and behavior using data mining.

[6] S. Ahmed et al. (2008).An enhanced recommendation technique for personalized ecommerce portal

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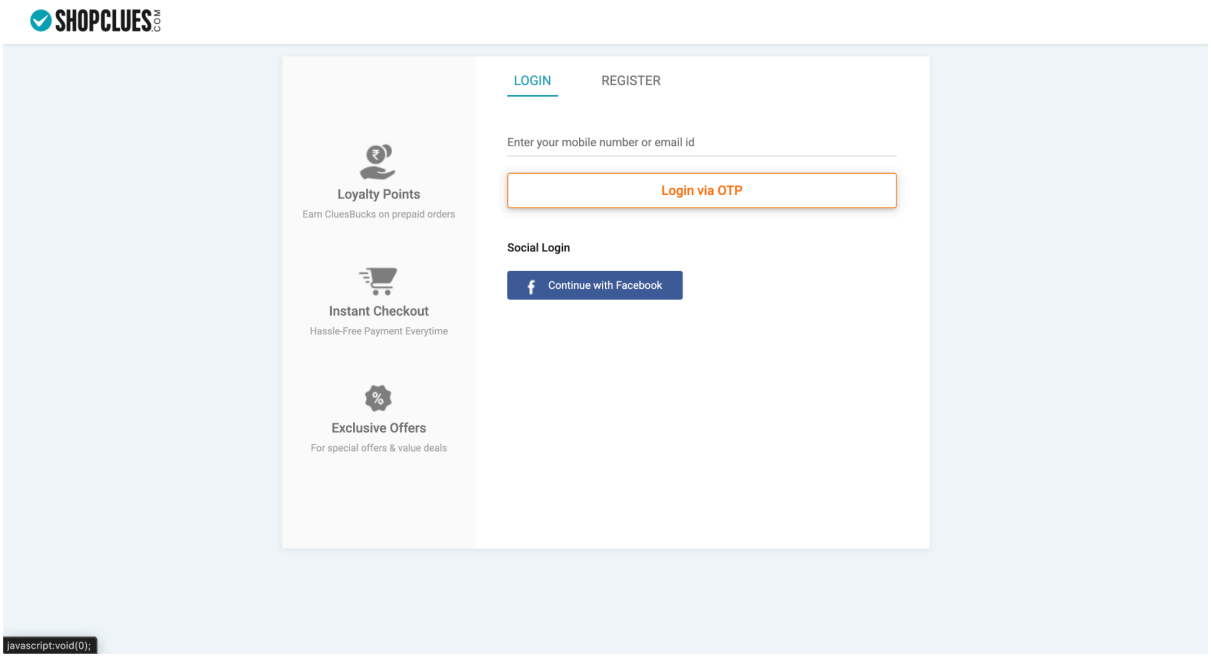
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