

## **GISAN: A Responsive E-Commerce Website**

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<p><b>Peer Review Information</b></p> <p><i>Type: Article</i> <i>Received: 23 February 2026</i> <i>Revised: 24 March 2026</i> <i>Accepted: 22 April 2026</i> <i>Published: 20 May 2026</i></p>	<p style="text-align: center;"><b>Abstract</b></p> <p>E-commerce platforms have become an essential part of modern business by providing customers with convenient and fast online access to products and services from anywhere at any time. This paper presents the design and development of Gisan, a responsive e-commerce website built using PHP, PostgreSQL, HTML, CSS, and JavaScript. The system is designed to deliver a smooth and user-friendly shopping experience by enabling product browsing, category-based filtering, and efficient search functionality. It also supports key operations such as shopping cart management, order placement, and secure data handling.</p> <p>In addition, the system includes an admin dashboard that allows administrators to manage products, users, orders, and customer interactions through a centralized interface. The development process focuses on integrating frontend design with backend functionality to ensure performance, reliability, and scalability. The results demonstrate that the system is efficient, easy to use, and capable of handling real-world e-commerce requirements, making it suitable for both academic and practical applications.</p> <p><b>Keywords:</b> E-commerce; PHP; PostgreSQL; Web Development; Shopping Cart; Admin Dashboard; Responsive Website</p>
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### **How to Cite This Article**

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## Introduction

In recent years, the widespread availability of the internet and advancements in digital payment systems have significantly influenced the way people shop and conduct business. Traditional shopping methods require customers to visit physical stores, spend time selecting products, and depend on manual billing processes. These methods are often time-consuming and less convenient.

E-commerce platforms have emerged as a powerful alternative by enabling customers to shop online from the comfort of their homes. These platforms provide features such as product browsing, price comparison, online payments, and doorstep delivery, making the entire shopping experience faster and more efficient.

The proposed system, **Gisan**, is a web-based e-commerce platform designed to simulate a real-world online shopping environment. It focuses on providing a seamless experience for both customers and administrators. Customers can easily browse products, filter them by categories, add items to a shopping cart, and place orders. Meanwhile, administrators can manage the entire system through a centralized dashboard.

The project utilizes PHP as the backend scripting language and PostgreSQL as the database management system. The frontend is developed using HTML, CSS, and JavaScript to ensure responsiveness and visual appeal across different devices.

This project highlights the importance of integrating multiple web technologies to create a complete digital commerce solution that is efficient, scalable, and user-friendly.

## Literature Review

The development of e-commerce systems has been widely studied in the field of web engineering and software development. Existing research indicates that a successful e-commerce platform depends on several critical factors such as usability, security, scalability, and efficient database management.

Many early academic projects focused primarily on basic functionalities like product display and order placement. However, modern e-commerce systems require additional features such as responsive design, intuitive navigation, advanced filtering options, and secure user authentication.

Research also emphasizes the importance of using relational database systems like PostgreSQL for managing structured data such as user information, product details, orders, and transactions. PostgreSQL is known for its reliability, data integrity, and ability to handle complex queries efficiently.

Dynamic programming languages like PHP are commonly used for developing server-side applications due to their flexibility and ease of integration with databases. Studies also highlight the role of frontend technologies such as HTML, CSS, and JavaScript in creating visually appealing and interactive user interfaces.

The analysis of existing systems shows that many student-level projects lack complete admin functionality and polished user interfaces. The Gisan project aims to address these gaps by combining practical features with an improved user experience and a structured backend system.

### *Existing E-Commerce Systems*

- Most systems support product display and ordering.
- Advanced systems include filtering, recommendations, and analytics.
- Commercial platforms focus on scalability and performance.

### *Technologies Used in Research*

- PHP for backend development.
- PostgreSQL for database management.
- HTML, CSS, JavaScript for frontend design.

### *Limitations in Existing Academic Projects*

- Lack of responsive UI design.

## GISAN: A Responsive E-Commerce Website

- Limited admin control features.
- Poor user experience and navigation.
- Incomplete workflow (missing cart or checkout logic).

### *Improvements Proposed in Gisan*

- Fully functional shopping workflow.
- Admin dashboard for complete control.
- Responsive and attractive UI.
- Structured database integration.

## **Methodology**

The development of the Gisan e-commerce website followed a systematic and structured approach to ensure efficiency and accuracy at each stage. The process began with **requirement analysis**, where the needs of both customers and administrators were identified.

After understanding the requirements, the next step was **system design**, which involved planning the overall architecture of the application, including user interfaces, workflows, and data flow. This was followed by **database design**, where PostgreSQL tables such as users, products, categories, orders, order\_items, and contact\_messages were created.

The **frontend development** phase focused on designing responsive and user-friendly interfaces using HTML, CSS, and JavaScript. Special attention was given to layout design, navigation, and product presentation to enhance user experience.

The **backend development** was implemented using PHP, which handled server-side operations such as user authentication, product retrieval, cart management, order processing,

### *Requirement Analysis*

- Identification of two main users:
  - Customers
  - Administrators
- Customer requirements:
  - Browse products
  - Search and filter
  - Add to cart and checkout
- Admin requirements:
  - Manage products, users, and orders

### *System Design*

and data storage. Integration between frontend and backend ensured smooth data flow and system functionality.

An **admin module** was developed to allow administrators to manage system operations efficiently. This module includes features such as product management, user monitoring, order tracking, and message handling.

Finally, the system underwent **testing and debugging** to identify and fix errors, followed by deployment in a local server environment using tools like XAMPP.

- Design of user interface (UI)
- Navigation flow planning
- Page structure:
  - Homepage
  - Product page
  - Cart page
  - Admin dashboard

### Database Design

- PostgreSQL used as database
- Main tables:
  - Users
  - Products
  - Categories
  - Orders
  - Order\_Items
  - Contact\_Messages
- Relationships
  - Users → Orders
  - Orders → Order Items
  - Products → Categories

### Frontend Development

- HTML for structure
- CSS for styling
- JavaScript for interactivity
- Features:
  - Responsive layout
  - Product cards
  - Navigation bar and footer
  - Search and filter UI

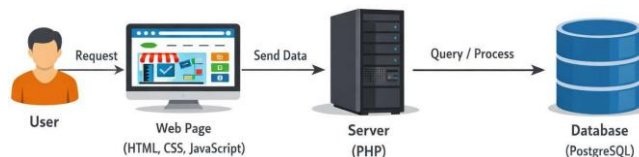
### Backend Development

- PHP used for server-side logic
- Functionalities:
  - User authentication (login/register)
  - Product retrieval
  - Cart operations
  - Order processing
  - Contact form handling

### Admin Module Implementation

- Secure login system
- Dashboard features:
  - Manage products
  - View users
  - Track orders
  - View contact messages

### System Architecture



**Fig. 1.** System Architecture of GISAN: Responsive E-Commerce Website

## GISAN: A Responsive E-Commerce Website

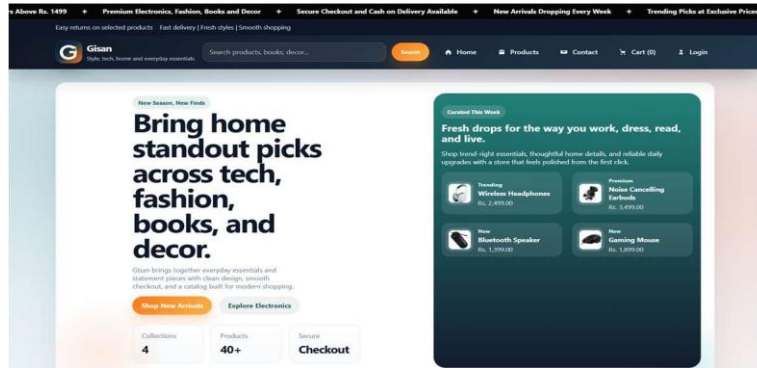
The system follows a client-server architecture for efficient data processing and communication. The client side is developed using HTML, CSS, and JavaScript, which provides the user interface and handles user interactions. When a user performs an action such as browsing products or placing an order, the request is sent to the server.

The server side is developed using PHP, which processes the request and interacts with the PostgreSQL database. The database stores all the necessary information such as user details, product data, and order records. After processing the request, the server sends the response back to the client, which is then displayed to the user.

This architecture ensures efficient data handling, scalability, and improved user experience.

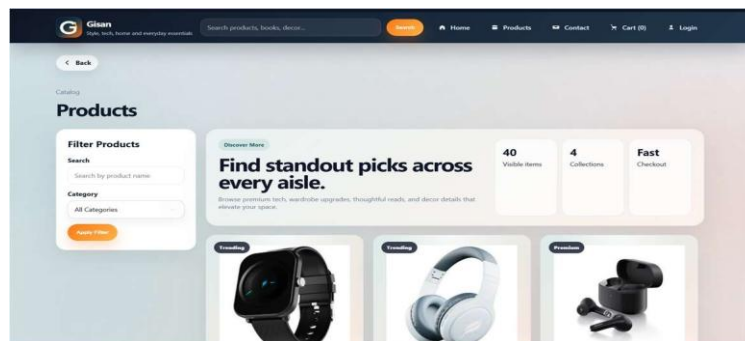
## System Implementation

### Home Page of Gisan Website



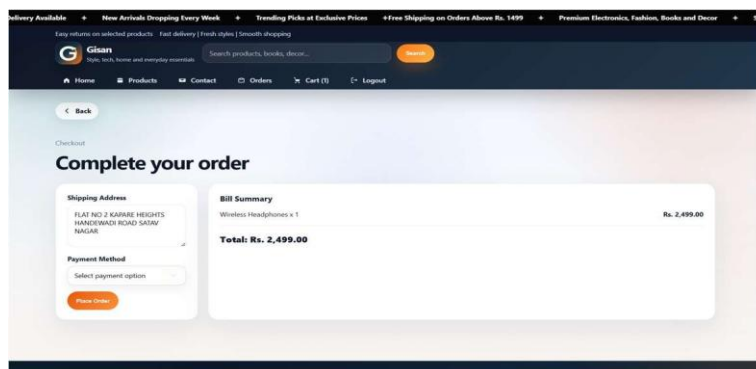
The home page provides an overview of the website, displaying featured products, navigation options, and categories. It allows users to easily explore the platform and access different sections.

### Product Listing Page



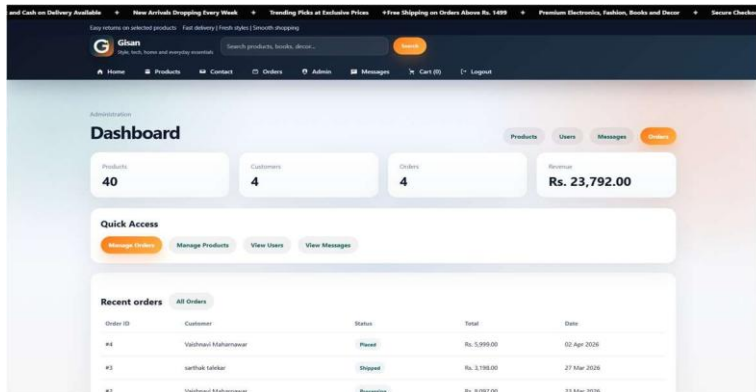
The product page displays a list of available products with details such as price, image, and description. Users can browse and select products based on their preferences.

### Checkout Process



The checkout page allows users to enter their details and complete the purchase process. It ensures secure and efficient order placement.

*Admin Dashboard for Managing Products and Orders*



The admin dashboard enables administrators to manage products, users, and orders. It provides full control over the system and ensures smooth operation of the website.

**Results / Findings**

The developed Gisan e-commerce system successfully achieves the objectives defined at the beginning of the project. The system provides a complete online shopping experience with all essential features expected from a modern e-commerce platform.

The homepage offers an attractive storefront design with featured products, promotional banners, and easy navigation. The product module allows users to browse items, perform keyword-based searches, and apply category filters to refine their choices.

The shopping cart functionality enables users to add products, modify quantities, and review selected items before proceeding to checkout. The checkout process ensures that order details are securely stored in the PostgreSQL database along with item information.

The contact module allows users to send queries or feedback, which are stored in the database and accessible to the administrator. The admin dashboard provides a centralized interface for managing users, products, orders, and messages without requiring manual database operations.

Overall, the system demonstrates reliability, efficiency, and usability, making it suitable for real-world applications as well as academic purposes.

**Testing And Test Cases**

The system was tested module-wise to ensure correct functionality and smooth user interaction. All major features such as registration, login, product search, cart operations, checkout, and database connectivity were verified. The results confirmed that the system works accurately, with all test cases passing successfully and data being stored and retrieved correctly.

*Table 1: System Testing and Validation Results*

Test Case ID	Module	Test Scenario	Expected Result	Actual Result	Status
TC01	User Registration	Register with valid details	New account should be created	Account created successfully	Pass
TC02	User Login	Login with valid customer credentials	Customer should login successfully	Login successful	Pass

TC03	Admin Login	Login with admin credentials	Admin dashboard should open	Dashboard opened correctly	Pass
TC04	Product Search	Search a valid product name	Matching products should display	Relevant products displayed	Pass
TC05	Category Filter	Filter products by category	Selected category products should appear	Filter worked correctly	Pass
TC06	Cart	Add product to cart	Cart should update with selected item	Cart updated correctly	Pass
TC07	Checkout	Place order with valid details	Order should be stored in database	Order saved successfully	Pass
TC08	Orders Module	Open orders page after checkout	Placed order should be visible	Order visible to user and admin	Pass
TC09	Contact Form	Submit contact message	Message should be stored in database	Message stored successfully	Pass
TC10	PostgreSQL Connectivity	Load pages connected to PostgreSQL	System should fetch/store data correctly	Database operations executed successfully	Pass

**Discussion**

The results of the project demonstrate that combining PHP and PostgreSQL is an effective approach for developing a dynamic and database-driven e-commerce application. One of the key strengths of the system is the integration of both customer and admin functionalities within a single platform.

The project also highlights the importance of user interface design in enhancing user experience. A well-designed UI improves usability and encourages users to interact with the system more efficiently.

However, the system has certain limitations. It currently lacks features such as online payment integration, product reviews, recommendation systems, and advanced analytics. These features are commonly found in commercial e-commerce platforms and can be added in future versions of the project. Despite these limitations, the system successfully meets its primary objectives and provides a strong foundation for further enhancements.

**Conclusion**

The Gisan e-commerce website project successfully demonstrates the development of a complete and functional online shopping platform using modern web technologies. The system includes essential features such as user authentication, product browsing, category filtering, shopping cart management, order processing, contact handling, and administrative control.

The project achieves its goal of creating a user-friendly and efficient digital commerce system. It also showcases the practical application of PHP and PostgreSQL in building scalable web applications.

In the future, the system can be enhanced by integrating advanced features such as online payment gateways, product reviews, personalized recommendations, inventory management, and detailed analytics.

Overall, the project serves as a valuable learning experience and provides a strong base for developing real-world e-commerce solutions.

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