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DESIGN OF INTELLIGENT SHOPPING SYSTEM BASED ON E-COMMERCE PLANT TRADING

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ABSTRACT:

For plant buyers and sellers in today's digital market, the lack of a specialized e-commerce platform for trading plants presents major hindrances. Current solutions tend to be generic, without key elements like enhanced search, secure verification, and responsive mobile optimization. This project develops solutions to these problems by suggesting an Intelligent Shopping System for E-Commerce Plant Trading. The system also seeks to offer a secure, user-friendly, and reactive environment that enables rapid discovery of products, secure transactions, and effective database administration. The development of the project made use of a full-stack development with HTML5, CSS3, JavaScript, Node.js, Express.js, and MongoDB. The final system effectively applied an operational product catalog, secure user login, and full order management system, which showed an effective foundation for future improvements such as AI-based recommendations.

Keywords – E-Commerce, Intelligent Shopping System, Full Stack Development, MongoDB, Express.js, React, Node.js

1. INTRODUCTION

The contemporary online marketplace for plants is plagued by the absence of a specific platform, causing inconvenience to buyers and sellers alike. Buyers encounter difficulties due to minimal categorization and non-responsive websites, while sellers encounter limitations in reaching masses and facilitating transactions effectively. In an attempt to eliminate these difficulties, this project launches the "Intelligent Shopping System Based on E-Commerce Plant Trading". The system offers a friendly, secure, and responsive website that simplifies the shopping process.The project was created while interning with Pantech e Learning Pvt. Ltd., a technology-based training company with expertise in real-time projects and industry-focused internships. The mission of the organization is to plug the gap between theoretical knowledge and practical skills. The internship offered a guided method and robust mentorship, which played a crucial role in the success of the project.

2. SYSTEM DESIGN AND METHODOLOGY

The Intelligent Shopping System's system design defines the application's logical framework and workflow. The process starts with user authentication for secure access. Upon logging in, users can navigate the plant catalog, see options, and pick an intended plant. The system then securely stores order information in the database to be processed. The design facilitates effective plant management, accurate record-keeping, and scalability for subsequent operations such as order tracking and individualized recommendations

Technology stack employed for the project is:

- **Frontend:** HTML5, CSS3, JavaScript (ES6+)
- **Backend:** Node.js, Express.js
- **Database:** MongoDB
- **Libraries:** Mongoose, Fetch API
- **IDE:** VS Code

The system design includes an Entity-Relationship (ER) diagram with the following entities and relationships:

- **Entities:** USER, PLANT, ORDER, ORDER_ITEM, PAYMENT, and FEEDBACK.
- **Relationships:**
    - USER – ORDER: One-to-Many
    - ORDER – ORDER_ITEM: One-to-Many

- PLANT – ORDER_ITEM: One-to-Many
- ORDER – PAYMENT: One-to-One

3. IMPLEMENTATION AND DELIVERABLES

Implementation of the project included the creation of some important modules with definite functionalities. The major deliverables were an intelligent shopping system with a product catalog of plants, filterable by categories, and smart search functionality. A cart and checkout experience were also implemented, as well as a secure user account system with JWT authentication.
The technical results were a solid RESTful API with Express.js and MongoDB schema models with Mongoose. The system is secure in authentication with hashed passwords and includes simple rate limiting and CORS policy

4. TESTING AND VALIDATION

Different tests were carried out to test and validate the functionality and performance of the system.

- **Functional Testing:** Form validation to validate data and adequate user feedback was included. User interaction tests were performed to verify smooth navigation, for example, redirecting to the checkout page on clicking "Buy Now" and appropriate use of payment methods.
- **UI/UX Testing** Responsiveness was verified on various devices (desktop, mobile, and tablet) to validate correct layout and readability of text.Performance
- **Testing:** Load time was tested in the system, targeting an average API response of under 300 ms for search and catalog functions. It also tested
- **Validation:** HTML/CSS and JavaScript validation were executed to maintain code quality and avoid syntax errors.

5. OUTCOMES AND RESULTS

The project yielded an e-commerce site that worked for plant trading. Users provided positive comments, considering the system user-friendly and convenient in searching and buying plants. The backend functions, namely login, product management, and the order process, were successful, and the database effectively managed user and product information.

Fig 1: Home page

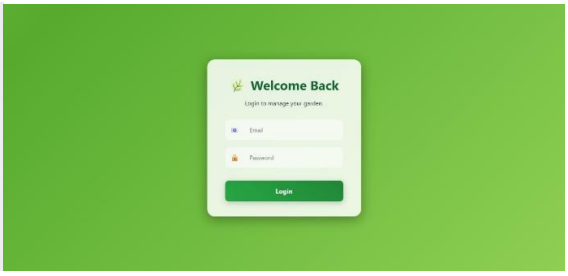

Fig 2: Login page

Fig 3 Plant Management page

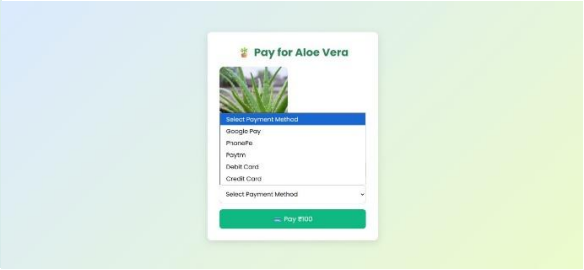

Fig 4 Payment page

6. CONCLUSION

The Intelligent Shopping System project was able to effectively create a specialized and resilient e-commerce platform for plant exchange. Through the combination of a full-stack solution and user-oriented design principles, the system rectifies the generic platform's common problems and offers room for future development. The effective implementation, along with user satisfaction, supports the validity of the effectiveness of the system as well as its viability to become an all-encompassing and viable e-commerce platform.

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