Aquarium Equipment and Accessories Online Shopping System

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Abstract. The Aquarium Equipment and Accessories Online Shopping System is a web-based application designed to simplify and enhance the purchasing experience for the aquarium enthusiasts. The system provides a dedicated platform where users can browse, select, and purchase a wide range of aquarium-related products including tanks, filters, lighting, fish food, cleaning tools, decorations, and other accessories. This system aims to bridge the gap between suppliers and customers by offering a centralized and user-friendly interface with features such as product categorization, detailed item descriptions, real-time stock updates, secure payment gateways, and order tracking. Additionally, it offers user account management, wish lists, and personalized recommendations based on browsing history and purchase behavior. For administrator, the backend system allows for inventory management, order processing, customer service, and report generation, ensuring smooth business operations. By leveraging modern technologies, the system enhances accessibility, convenience, and customer satisfaction, ultimately contributing to the growth of the aquarium hobbyist community and the online retail ecosystem.

Keywords: aquarium, aqua scaping, products, tank setup, user guide, water quantity

INTRODUCTION

Aquariums have become popular as hobby and decorative feature in both residential and commercial spaces. With growing interest in aquariums, the demand for a wide range of equipment and accessories essential for maintaining healthy aquatic environments is increasing. The Aquarium Equipment and Accessories Online Shopping System is a digital platform where customer can conveniently browse, compare and purchase aquarium products from the comfort of their homes. The system offers a wide selection of items such as fish tanks, filtration systems, lighting, water conditioners, decorations, heaters and soil, all organized into easy-to-navigate categories. The system aims to improve customer satisfaction, expand market reach for sellers and promote the growth of the aquarium hobbyist community. The development of this system integrates web development management and e-commerce functionality to create a comprehensive solution tailored to the specific needs of the aquarium enthusiasts.

PROBLEM

Maintaining a healthy and sustainable aquarium environment requires constant monitoring and management of various parameters such as water quality, temperature, lighting, feeding schedules, and species compatibility. Many hobbyists and even professionals struggle

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with maintaining optimal conditions due to a lack of real-time data, poor record-keeping, or limited knowledge of aquatic ecosystems. Manual tracking is error-prone, time-consuming, and can lead to severe consequences like fish diseases, algae outbreaks, or even loss of livestock due to overlooked changes in tank conditions. Additionally, setting up a new aquarium often lacks guided support, leading to improper setup, unbalanced ecosystems, or species incompatibility.

APPROACH

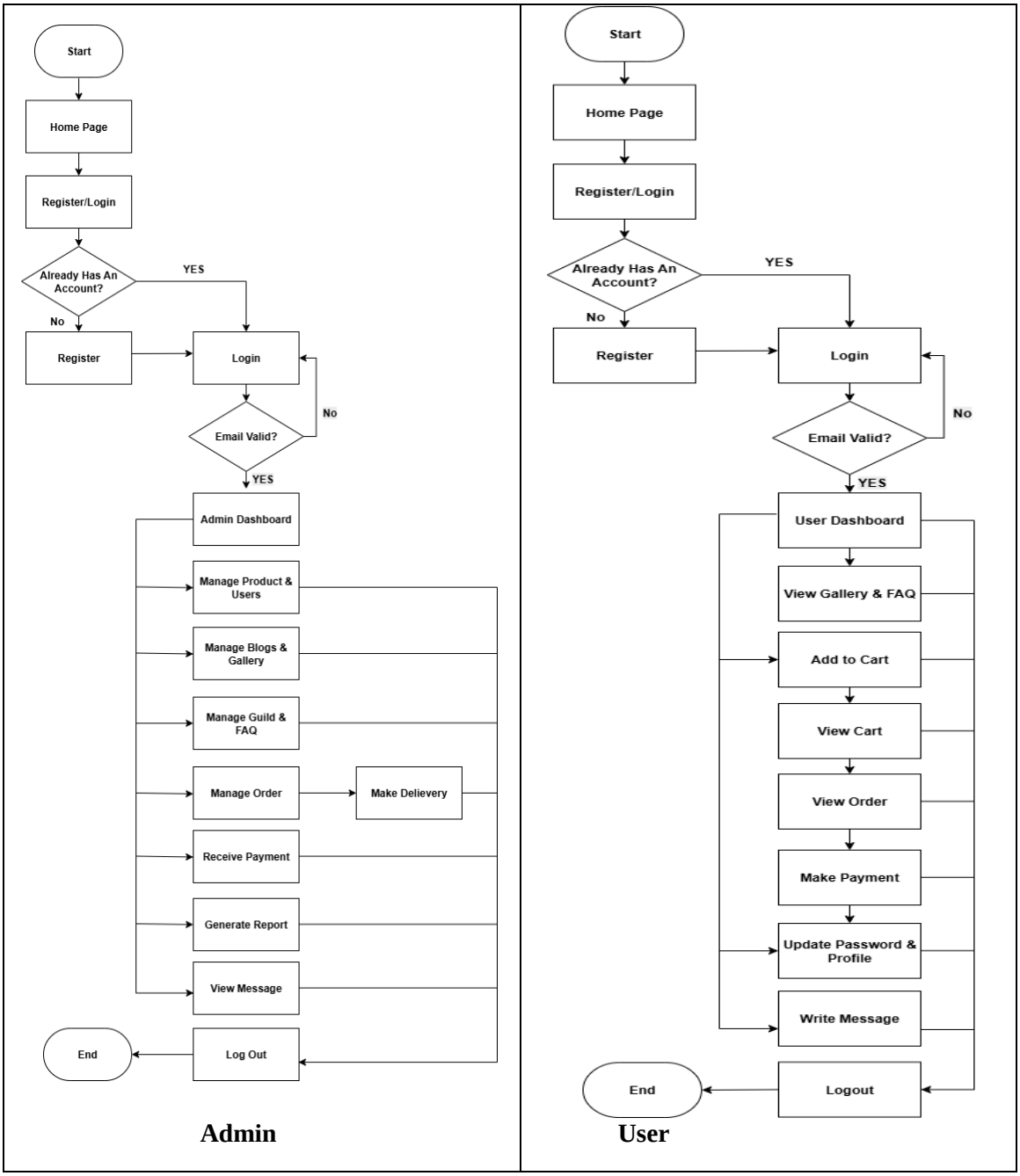

Figure 1: System Flow Diagram

In the Aquarium Equipment and Accessories Online Shopping System, there are two main roles: admin and users. The admin is responsible for managing the system, including adding, editing, and deleting products and categories, handling customer orders, updating order

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statues, and generating sales reports. The admin can also manage user accounts and respond to customer feedback. On the other hand, the users (customers) can register, log in, browse products by category, add items to the shopping cart, place orders, and make payments. The users can also view their order history, check order status, update their profiles, and leave product reviews. This role-based structure ensures efficient system management and a smooth shopping experience.

In Figure 1, the system flow for the admin, the process begins with admin login. Once authenticated, the admin can manage products by adding, editing, or deleting items and categories. They can also view and update customer orders, change order statuses (such as pending, shipped, or delivered), and monitor payments. Additionally, the admin can manage user accounts, respond to customer feedback, and generate sales reports. All admin actions interact directly with the database to keep the system up-to-date and organized. For the users, the system flow starts with registration and login. After logging in, the users can browse products by category, view product details, and add items to their shopping carts. They can proceed to checkout, confirm delivery details, and make payments. Once an order is placed, the users can view their order histories and track order status. They also have access to update their profiles and leave reviews for purchased products. Each action triggers corresponding backend processes to handle data and ensure a smooth user experience.

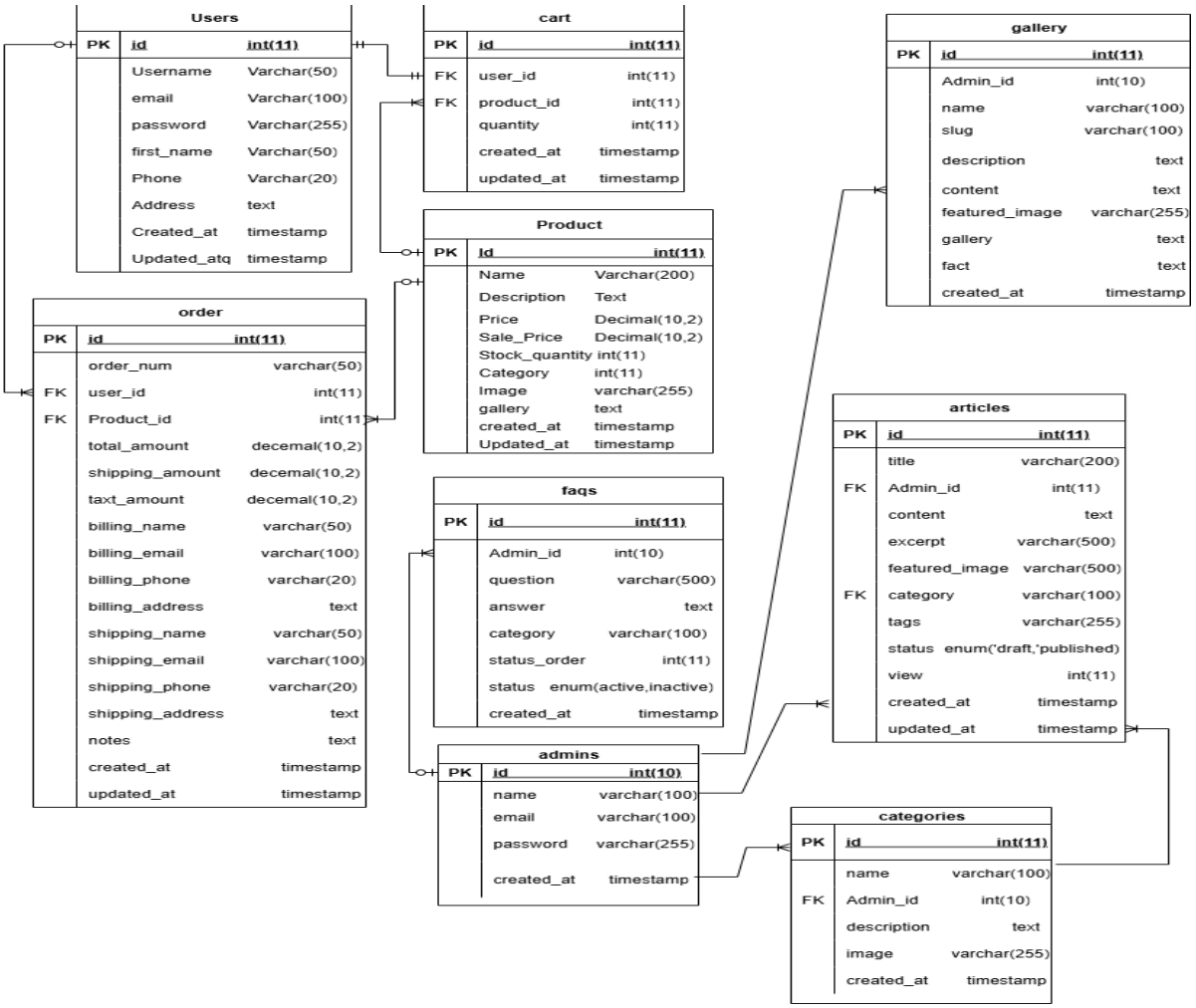

Figure 2: Database Design

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An Entity Relationship Diagram (ERD) also known as an entity relationship model, is a graphical representation that depicts relationships among people, objects, places, concepts or events within an Information Technology (IT) system. An ERD uses data modeling techniques that can help define business processes and serve as the foundation for a relational database. The system also supports content management through Articles, Categories, FAQs, and a Gallery, allowing for the organization of informational posts, product classifications, frequently asked questions, and multimedia assets. The admin oversees the entire platform, with permissions to manage products, orders, and contents. The relational links between tables ensure efficient data flow, such as connecting the users to their orders and carts, and associating products with categories and galleries. This well-structured database design enables seamless operation, effective inventory management, and a rich user experience within the Aquarium Equipment and Accessories Online Shopping System.

RESULTS

The implementation of the Aquarium Equipment & Accessories Online Shopping System resulted in a significant improvement in aquarium maintenance efficiency and aquatic life health. The users reported easier setup processes, thanks to the system's guided aquarium creation and species compatibility features. Regular maintenance tasks such as feeding, water changes, and filter cleaning were completed more consistently due to automated schedules and timely alerts. Monitoring of water parameters, whether manual or through IoT devices, enabled quicker response to issues, reducing fish mortality and improving overall tank stability. Historical data tracking and visual reports provided the users with better insight into their aquarium conditions over time. Overall, the system enhanced user engagement, reduced manual errors, and promoted healthier, more sustainable aquatic environments. Figure 3 shows the home page of this system.

Figure 3. Home Page

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Figure 4 shows the calculated volume of an aquarium tank based on user input, with results indicating a tank capacity of 27.00 liters or 7.13 gallons. The detailed tank specifications include dimensions (30 × 30 × 30 cm), volume, recommended soil weight (2.7 - 4.1 kg), required lighting power (27.00 watts), and CO_2 injection rate (0.4 bps).

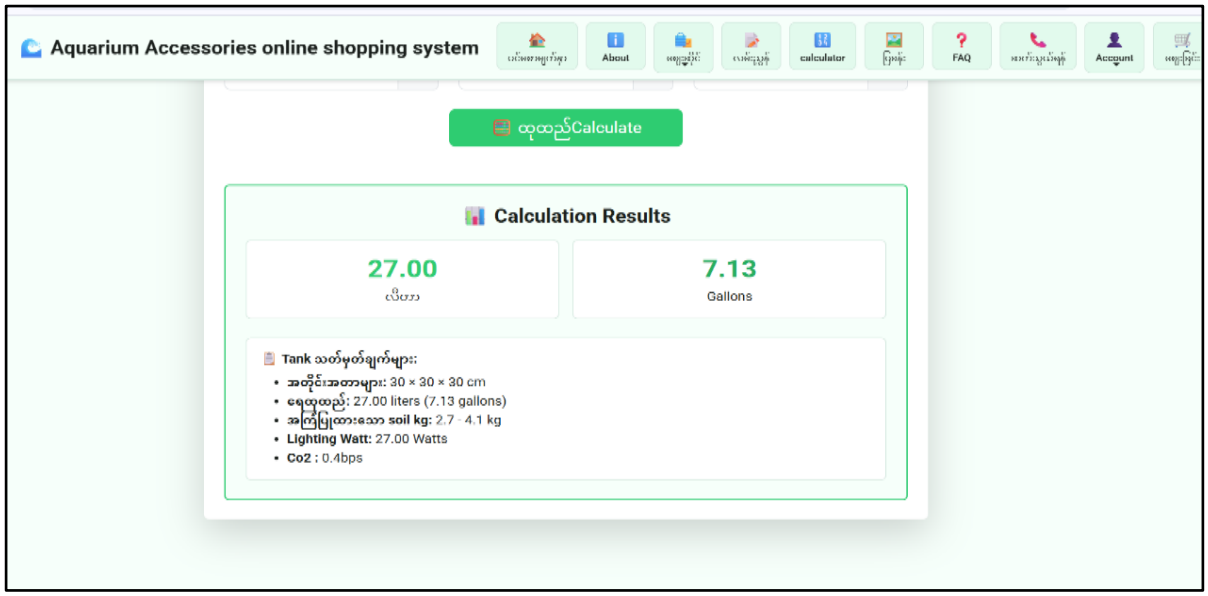

Figure 4. Calculated Volume of an Aquarium Tank

Figure 5 shows the best-selling products of the Aquarium Equipment & Accessories Online Shopping System.

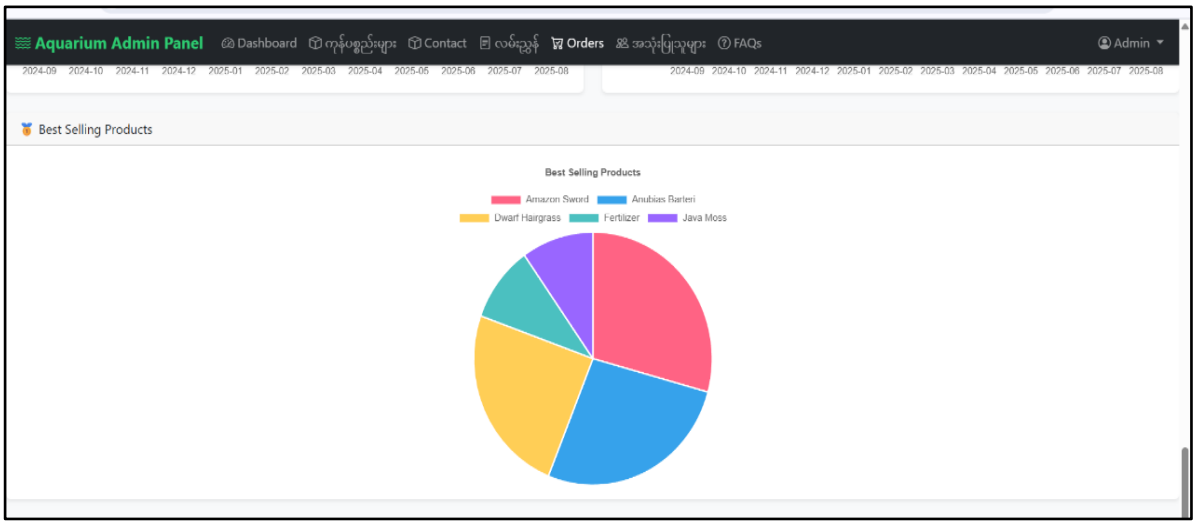

Figure 5. Best-selling Product

CONCLUSION

The Aquarium Equipment and Accessories Online Shopping System provides a convenient and efficient platform for the users to browse and purchase the aquarium-related products online. It streamlines the shopping process for customers while giving administrators full control over product, order, and user management. By integrating user-friendly design, secure transactions, and effective admin tools, the system enhances both customer satisfaction

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and business operations. Overall, it serves as a reliable solution to connect aquarium product sellers with buyers in a modern digital environment. It bridges the gap between knowledge and application, empowering the users to build healthy, beautiful, and sustainable aquariums while promoting long-term success and enjoyment in the aquatic hobby.

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