

Sri Lanka Institute of Information Technology



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Web-based Musical Instrument Selling System

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1. Introduction

To execute purchasing, selling and managing musical instruments through an online medium a web based Musical Instrument Selling System is proposed. Using musicians, retailers, collectors and suppliers as the primary target a system is going to be designed offering a convenient, secure and feature rich environment to both customers and employees. The gap between traditional instrument retail and modern online shopping trends such as providing an accessible platform to promote to a wider reach is shrunken by the web-based system.

Project Objectives

The core objectives of the system are:

1. To provide a secure and user-friendly interface for customers to browse, filter, and purchase musical instruments from anywhere, at any time.
2. Streamline Stock and Order Management by providing easy management of stock, accepting orders and delivering them to the doorstep.
3. To embed facilities such as tracking orders, personal accounts, and prompt support to raise customer satisfaction and loyalty.
4. Provide analytics to managers in order to measure sales performance, keep an eye on profitability and make decisions based on data for a better improvement of the business.
5. Provide Secure Transactions through the use of reputed payment gateways in order to protect customer details and financial transactions.

Project Goals

The long-term goals of the system are to:

- Tackle increasing product catalogs, customer traffic, and payment transactions without experiencing any loss in performance.

- Improve brand awareness and credibility through a professional, responsive, and accessible online shop.
- Boost the availability of music instrument sales to more users, including rural location customers with internet access.
- Offer a foundation for the addition of future features like promotion discounts, loyalty programs, and mobile application integration.

Key Stakeholders

- Customers – Companies or individuals purchasing music instruments over the internet.
- Sales Staff – Personnel managing product listings, order handling, and customer support.
- Shop Administrators / Managers – Oversee system operations, manage users, and make strategic business choices.
- Suppliers – Provide inventory, spare parts, and accessories for sale.
- Delivery Partners – Conduct shipping and delivery of goods sold to clients.

Project Scope

The system will include:

- Core Features: Product display with advanced filtering, secure online ordering and payment, stock management, order tracking, and financial reporting.
- Features Supporting: User authentication, password recovery, and customer support using contact forms.
- Pieces of Operation: Admin panel for user, stock, and report management, and integrated APIs for payment and logistics services.

2. System Diagram

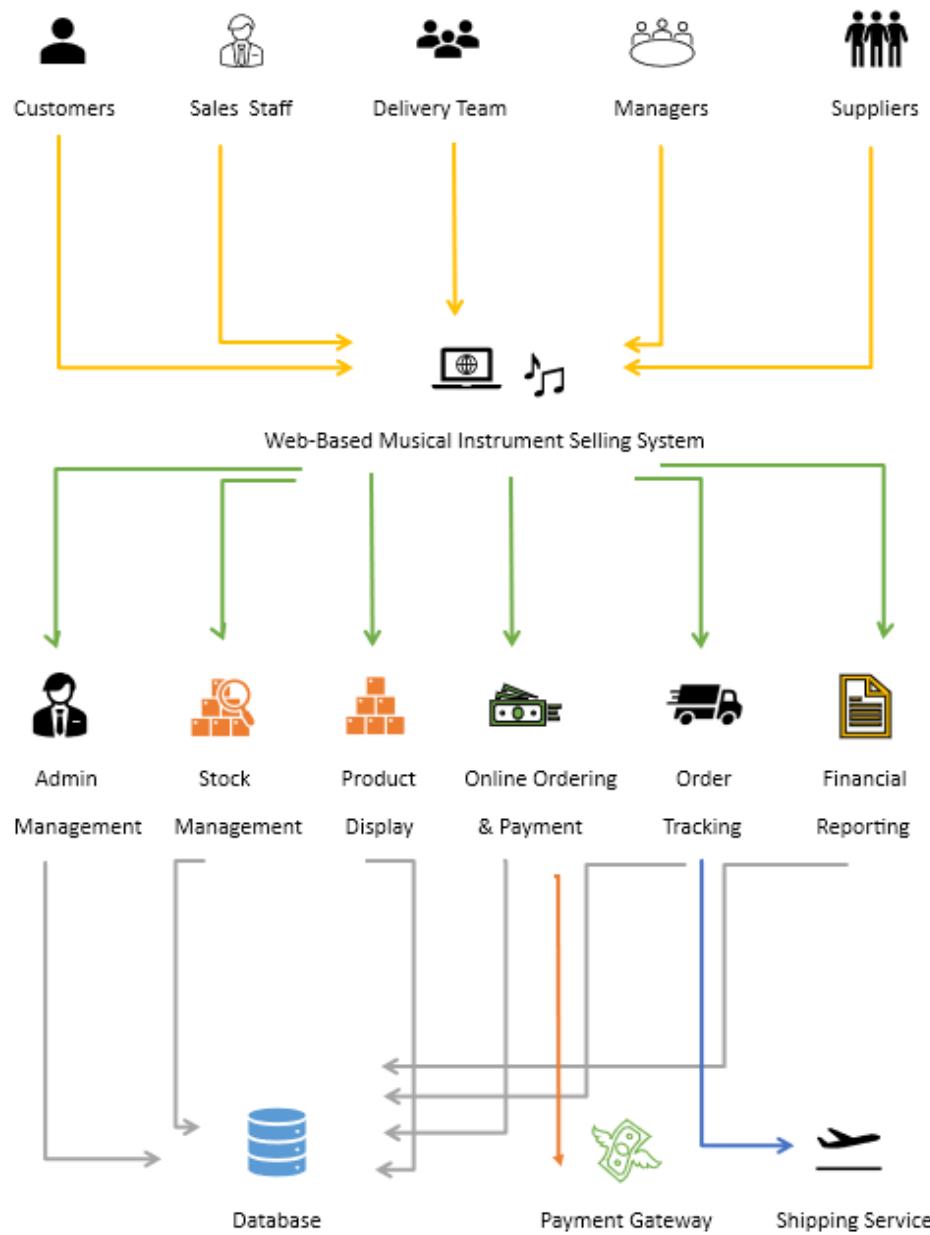


Figure 2.1

3. Functional requirements

The Musical Instrument Sales System must support an array of key functionalities to meet the diverse needs of its users effectively. These requirements form the basis for the system's functional capabilities:

- Admin Management: This functionality allows administrators to manage and regulate user accounts, monitor system performance, and adjust settings for best operation. It includes facilities for adding/deleting users, verifying registrations, and managing permissions.
- Product Display: This functionality enables the system to show a full inventory of musical instruments with details such as instrument type, brand, price, availability, and high-quality images. Customers can browse and filter products to find their choice easily.
- Online Ordering and Payment: This feature provides customers with the feature of selecting instruments, adding them to a cart, and purchasing them using a secure online payment process. It supports multiple modes of payment like credit cards and digital wallets for ultimate convenience.
- Stock Management: This module tracks the stock of instruments in real time, allowing employees to modulate stock levels upon sale or restocking. It has even automated notifications to remind administrators when stock is getting low, thereby eliminating overselling.
- Order Tracking: This option gives the customer real-time tracking of their orders from receipt to delivery. It connects with logistics operators to provide accurate tracking data, increasing transparency and trust.
- Financial Reporting: Using reports of sales performance, revenues and expenditure helps administrators to make better financial choices based on sales data.

4. Non-Functional Requirements

Other than the core functionalities the system should be able to also satisfy some non-functional requirements to offer high-quality customer satisfaction and operational reliability:

- Performance: All transactions and queries should be executed within less than 2 seconds to maintain the user's experience responsive even at times of maximum usage.
- Security: Secure encryption schemes must be employed for payment processing and storage of user data, following GDPR, and protection from data breaches.
- Usability: The interface should be easy to use and accessible, having a responsive design that loads gracefully on desktops, tablets, and mobiles for everyone.
- Reliability: The system should have 99.9% uptime to reduce interruptions, backed by routine maintenance and backup systems.
- Scalability: The system should be able handle more user traffic and data volume, especially during high demanding times such as holiday seasons, without being affecting the performance.

5. Major Stakeholders

Customers – Buy instruments and expect good service.

Sales staff – Help customers and manage orders.

Shop manager – Manage the shop and make business decisions.

Delivery team – Deliver the instruments to the customers.

Suppliers – Provide us with musical instruments and parts.

6. Major Functionalities

All the core functions are created using some tools and outcomes that help the purposes of the system to ensure a whole solution to the Musical Instrument Selling System:

- Admin Management: It uses a centralized user database and admin panel with controllable controls so that administrators can create, edit, or delete user accounts, approve new registrations, and modify system features such as payment thresholds or visual settings to achieve a secure and well-organized system where administrators can have control and handle problems immediately. This feature is essential for the integrity and effectiveness of the system, allowing administrators to obtain a picture of user activity, restrict access to sensitive operations to authorized personnel, and make speedy changes to adapt to changing business requirements, such as modifying user permissions or debugging system errors, hence giving a seamless administration experience.
- Product Display: This functionality employs a product database to store detailed records and an image gallery for graphical display to show instruments with filters by category, price range, and brand, enabling customers to find and compare options effectively, with the objective of offering an interactive and efficiently optimized browsing experience that encourages customer buying. As the storefront of the system, it attracts customers by emphasizing a large range of musical instruments, with filters making it easy for users to search for specific products like electric guitars or acoustic pianos quickly, and with clear pictures and detailed descriptions eliciting trust and interest, hence constituting an integral part to persuasive sales and improved customer satisfaction.
- Online Ordering and Payment: It uses an e-commerce system with an integrated secure payment system supporting a variety of ways to lead customers through the process of selecting products, viewing their basket, and payment with real-time transaction verification, towards a secure and reliable purchasing process to establish customer confidence. Being the transactional center of the application, it provides an effective process for customers to purchase instruments on the internet, with different payment modes like credit cards, PayPal, and electronic wallets being to different tastes, while real-time verification ensures transactions security, establishing

customers' confidence, causing repurchasing, and causing word-of-mouth necessary for business growth.

- Stock Management: The feature uses an inventory database that is linked with sales data and an alerts system for low stock level notification to automatically decrease stock levels after each sale and email admins when stock drops below a certain level, to enable accurate stock tracking that prevents stockouts and enables effective restocking. Essential to the effectiveness of operation, it enables the system to precisely update based on current inventory status, devoid of manual intervention via automatic updates, while the alert system enables timely restocking, preventing lost sales due to out-of-stock products and. allowing staff to maintain an effective inventory balancing supply with demand and optimizing warehouse management.
- Tracking for Orders: This functionality employs an order database and tracking API integrated with shipping carriers to inform customers of status changes (e.g., shipped, out for delivery) and provide a tracking link for complete progress, with the aim of achieving customer satisfaction by being open and keeping customers informed. It enhances post-purchase experience by involving customers for their shipments, with shipping APIs built-in to give real-time and accurate status information, reducing customer calls and fostering trust, particularly for high-value items like musical instruments where timely delivery status equals loyalty and satisfaction.
- Financial Reporting: This module utilizes aggregated sales facts and advanced reporting tools with visualization feature to create monthly or user-defined period reports of sales trends, revenue, and expense information with the goal to provide actionable information that enables business owners to optimize operations and profitability. It provides business owners with the data necessary to make informed decisions, viewing sales patterns and cost trends in order to determine profitable products, optimize pricing strategies, or remove wasteful costs, making this analytical role key to long-term success through providing a clean financial snapshot that can enable budgeting and growth planning.

7. Minor Functionalities

To support the core functionalities, the system also provides additional features to enhance user experience and system usability:

- **User Login:** This feature employs an authenticated system with password and username to allow users to register accounts and gain access to customized features like saved preferences and order history, with emphasis on secure and personalized user experience. It offers each client a secure, personalized account, which improves perception of ownership and convenience to encourage repeated use, with the authentication process protecting user information, satisfying security requirements.
- **Password Reset:** The feature uses email verification and a safe reset link to provide a secure method for users to recover or reset passwords when forgotten, towards improved account security and user retention. It is necessary to guarantee account accessibility while enhancing security, preventing unauthorized access through email verification to ensure that only the account owner can reset their password, cutting down on user frustration and promoting retention by offering a safeguard for forgotten passwords.
- **Contact Form:** This tool marries a web form with an email system to enable customers to submit questions, comments, or support inquiries to the team directly, with the hope of enhanced customer support and interaction. It offers a direct communication medium, allowing customers to complain or inquire about products or orders, improving customer service by providing an instant response system that fosters trust and enables the team to resolve issues on time, increasing overall satisfaction and brand reputation.

8. System Limitations / Constraints

The system has several constraints that could affect its implementation,

- Third-Party Dependence Involvement with third-party payment gateways often leads to downtime should the services encounter issues.
- Platform Limitation: Being web-based, the system excludes users without internet access, limiting its reach.
- Internet Requirement: The functionality depends on a stable internet connection, which can be a problem in remote areas.

9. Simple Timeline

| | Key Activity | Week 3 | Week 4 | Week 6 | Week 8 | Week 11 | Week 13 | Week 14 |
|------------|---|--------|--------|--------|--------|---------|---------|---------|
| Design | Requirements Finalization & Planning | | | | | | | |
| | UI/UX Design | | | | | | | |
| Develop | Backend Architecture & Database Design | | | | | | | |
| | Frontend Development (Phase 1) | | | | | | | |
| Testing | Frontend Development (Phase 2) | | | | | | | |
| | Frontend Development (Phase 2) | | | | | | | |
| | Testing & Bug Fixing (Phase 1) | | | | | | | |
| Deployment | Deployment Preparation | | | | | | | |
| | Project Launch & Post-Deployment Monitoring | | | | | | | |

10. Conclusion

The Musical Instrument Selling System is a viable solution to change online music retail by fulfilling the requirements of administrators, customers, and employees with its extensive set of features. Despite challenges such as third-party dependencies and platform constraints, the project is well within our team's capability, given our collective experience in system design, e-commerce, and project management. By adhering to the recommended timeline and fostering close collaboration, we are committed to offering a robust, user-friendly platform that meets the goals of projects and enhances the musical community by the semester's end.