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Web-Based Sales Information System Design for Andre Florist

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Abstract

Andre Florist operates a flower sales and decoration service business relying on manual systems, resulting in transaction inaccuracies, order processing delays, and restricted customer accessibility. This research develops a web-based sales information system to enhance operational efficiency and customer service quality. Data collection employs literature reviews, observations, interviews, and document analysis to establish system requirements. The proposed system incorporates product management capabilities, online ordering functionality, inventory control mechanisms, and real-time sales reporting features. Implementation of this web-based solution aims to expand marketing reach, improve data accuracy, and streamline transaction management for informed business decision-making at Andre Florist.

Keywords: Information System, Web-Based Application, Online Ordering, Sales Management, System Design

Introduction

Contemporary flower retail businesses face significant operational challenges when relying on conventional manual processes. Manual sales approaches frequently generate organizational inefficiencies including disorganized order documentation, extended processing timeframes, and limited market penetration (Kumar & Singh, 2021). Customers experience difficulties accessing real-time product information, pricing details, and inventory availability, potentially resulting in revenue losses and diminished competitive positioning (Martinez & Thompson, 2022).

Andre Florist exemplifies these challenges through its dependence on traditional sales methodologies. The absence of automated systems creates vulnerabilities in transaction accuracy, inventory management, and customer relationship development. Research demonstrates that small businesses implementing digital transformation through web-based systems experience substantial improvements in operational efficiency and customer satisfaction (Chen et al., 2020).

This research objective centers on developing a comprehensive information system capable of managing sales transactions and generating analytical reports effectively. The proposed system seeks to expand marketing accessibility through continuous online ordering services, enhance efficiency in inventory management and reporting processes, systematically simplify transaction handling procedures, and deliver accurate sales intelligence for strategic decision-making.

Literature Review

System

A system represents an integrated collection of interrelated components functioning collaboratively through repeated processes to achieve predetermined organizational objectives (Laudon & Laudon, 2020). Systems thinking emphasizes interconnectedness among various elements working toward unified goals through established procedures and protocols.

Information System

Information systems constitute integrated frameworks combining technological infrastructure, human resources, procedural methodologies, and data management practices designed to support organizational objectives (O'Brien & Marakas, 2021). These systems systematically collect, process, analyze, and distribute information to facilitate informed decision-making across organizational hierarchies (Stair & Reynolds, 2020).

Contemporary information systems serve as critical enablers of business intelligence, operational efficiency, and competitive advantage in digital economies.

Sales Information System

A sales information system encompasses comprehensive procedures for executing, documenting, calculating, and generating sales-related documentation and intelligence for management and operational departments (Pearlson et al., 2020). This system manages the complete sales lifecycle from initial order initiation through transaction completion, serving as a fundamental business subsystem alongside marketing, human resources, finance, and manufacturing functions (Turban et al., 2021).

E-Commerce and Online Sales

Electronic commerce platforms facilitate commercial transactions through digital channels, enabling businesses to reach broader customer bases beyond geographical constraints (Chaffey & Ellis-Chadwick, 2022). Web-based sales systems provide significant advantages including 24/7 accessibility, reduced operational costs, enhanced customer convenience, and data-driven marketing capabilities (Kalakota & Whinston, 2020).

Data Flow Diagram (DFD)

Data Flow Diagrams represent graphical modeling techniques illustrating information movement within systems and processes (Kendall & Kendall, 2021). DFDs provide comprehensive visualization of data inputs, outputs, storage mechanisms, and transformation processes without depicting procedural control flow or decision logic (Satzinger et al., 2020). These diagrams prove invaluable during system analysis phases by establishing clear understanding of existing and proposed system architectures.

Table 1. Data Flow Diagram Symbols

Symbol	Description
Rectangle	Entity (data source or destination)
Circle/Rounded Rectangle	Process (function being performed)
Open Rectangle	Data Storage
Arrow	Data Flow

Source: Adapted from Satzinger et al. (2020)

Database Management

Databases constitute organized collections of interrelated data structures designed for efficient storage, retrieval, and manipulation through electronic media (Coronel & Morris, 2021). Database management systems provide systematic approaches to organizing information in tables, files, and archives, enabling rapid access, sophisticated querying, and scalable data management aligned with organizational requirements (Ramakrishnan & Gehrke, 2020).

System Development Tools

Flowchart

Flowcharts provide graphical representations of sequential processes using standardized symbols to illustrate problem-solving steps and algorithmic logic (Pressman & Maxim, 2020). These diagrams facilitate program design by representing computational steps, decision points, and process flows in simplified, organized, and universally comprehensible formats (Sommerville, 2021).

Hypertext Preprocessor (PHP)

PHP constitutes a server-side scripting language designed for web development, enabling dynamic content generation through embedded HTML integration (Nixon, 2021). PHP translates human-readable code into machine-executable instructions, facilitating database connectivity, session management, and server-side processing capabilities (Duckett, 2022).

Cascading Style Sheets (CSS)

CSS represents a stylesheet language controlling visual presentation aspects of web documents, enabling separation of content structure from aesthetic design (Meyer, 2020). This separation enhances maintainability, development efficiency, and design flexibility by managing typography, layouts, colors, and responsive behaviors across diverse devices and screen dimensions (Cederholm, 2021).

Hypertext Markup Language (HTML)

HTML provides the foundational markup language for structuring web content, defining document semantics and hierarchical organization (Robbins, 2020). HTML establishes webpage frameworks, CSS manages visual styling, and JavaScript introduces interactive functionality, creating comprehensive web experiences (Freeman & Robson, 2022).

System Analysis and Design

Current System Flowchart

The existing sales workflow at Andre Florist operates through the following sequential stages:

1. Order Initiation: Customers arrive physically or communicate order requirements to store personnel
2. Order Reception: Employees receive customer specifications directly at retail location
3. Order Processing: Staff calculate total costs and compile order specifications
4. Manual Documentation: Orders are recorded manually for internal tracking purposes
5. Administrative Validation: Administrators receive order documentation via physical receipts for verification
6. Data Validation: Administrators review order accuracy including quantities, pricing, and customer specifications
7. Confirmation Return: Validated information returns to processing employees
8. Invoice Generation: Employees print invoices and prepare ordered products
9. Transaction Completion: Customers receive invoices and products, concluding the transaction

This manual approach presents significant limitations including error susceptibility, processing delays, limited scalability, and absence of digital analytics capabilities (Bhatti et al., 2020).

Proposed System Analysis

Proposed system analysis encompasses comprehensive evaluation of organizational requirements, identification of existing system deficiencies, stakeholder need assessment, and solution architecture development (Dennis et al., 2021). This analytical process establishes foundations for system design by defining objectives, constraints, and technical specifications necessary for successful implementation.

To address operational challenges at Andre Florist, this research proposes a web-based architectural solution incorporating the following enhancements:

The modernized system introduces:

- Digital order capture through web interfaces
- Automated data validation mechanisms
- Real-time inventory synchronization
- Electronic payment processing
- Automated reporting and analytics
- Customer account management capabilities

Context Diagram

Context diagrams illustrate high-level system boundaries, external entities, and primary data flows between systems and their operational environments (Hoffer et al., 2020). These diagrams establish foundational understanding of system scope and stakeholder interactions.

The context diagram identifies three primary external entities:

- Customers: Submit orders, make payments, and receive products
- Administrators: Manage products, process orders, and generate reports
- Cashiers: Validate transactions and update order statuses

Level 1 Data Flow Diagrams decompose high-level processes into detailed sub-processes while maintaining manageable complexity (Valacich & George, 2020). This level reveals internal system operations including specific data transformations, storage interactions, and process dependencies.

The Level 1 DFD decomposes the system into five primary processes:

1. User Authentication Management
2. Product Catalog Management
3. Order Processing
4. Inventory Control
5. Sales Reporting and Analytics

Results and Discussion

System Implementation

Login Page

The authentication interface incorporates security best practices including:

- Username/email identification fields
- Encrypted password input mechanisms
- Session management protocols
- New user registration pathways
- Password recovery functionality

Secure authentication systems protect sensitive business data while providing seamless user access to authorized system functionalities (Stallings & Brown, 2023).

Customer Dashboard

The customer-facing dashboard provides comprehensive self-service capabilities:

- Product catalog browsing with filtering and search
- Shopping cart management
- Order history tracking
- Transaction status monitoring
- Account profile management
- Product review submission

Intuitive dashboard designs enhance user experience by centralizing relevant information and frequently accessed functions (Nielsen & Budiu, 2021).

System Testing Results

System validation employed Black Box Testing methodology, focusing on functional requirements verification without internal code examination (Myers et al., 2021). This approach ensures system behavior aligns with specified requirements from end-user perspectives.

Customer Functionality Testing

Table 2. Customer Module Test Results

No.	Function Tested	Expected Result	Status
1	Website access	Homepage displays correctly	Valid
2	Registration form access	Registration interface appears	Valid
3	Registration completion	Successful account creation notification	Valid

No.	Function Tested	Expected Result	Status
4	Authentication	Customer dashboard loads after login	Valid
5	Product catalog browsing	Available products display correctly	Valid
6	Shopping cart management	Selected items appear in cart	Valid
7	Checkout process	Order form and payment options display	Valid
8	Order history review	Past transactions display accurately	Valid
9	Product review submission	Reviews post successfully	Valid

Source: System testing results (2025)

All customer-facing functionalities demonstrated expected behaviors, confirming system reliability for end-user operations. Comprehensive testing ensures software quality and user satisfaction by identifying defects before production deployment (Jorgensen, 2020).

Administrative and Cashier Testing

Table 3. Administrative Module Test Results

No.	**Function Tested**	**Expected Result**	**Status**
1	Admin portal access	Admin interface loads correctly	Valid
2	Administrative authentication	Role-appropriate dashboard displays	Valid
3	Transaction processing	Order verification and approval functions	Valid
4	Sales data monitoring	Real-time sales metrics display	Valid
5	Report generation	Comprehensive sales analytics available	Valid
6	Product management	CRUD operations on product catalog	Valid
7	Category organization	Product categorization functions properly	Valid
8	Review moderation	Inappropriate review removal capability	Valid
9	User account management	Account administration and deletion rights	Valid

Source: System testing results (2025)

Administrative testing validated management capabilities including transaction oversight, inventory control, reporting functionality, and user administration. Role-based access control ensures appropriate system privileges aligned with organizational hierarchies and responsibilities (Sandhu & Samarati, 2020).

System Benefits Analysis

Implementation of the web-based sales information system delivers multiple organizational advantages:

Operational Efficiency: Automated transaction processing reduces manual errors, accelerates order fulfillment, and minimizes administrative overhead (Brynjolfsson & McAfee, 2022).

Market Expansion: Online accessibility eliminates geographical constraints, enabling 24/7 customer engagement and broader market penetration (Chaffey & Ellis-Chadwick, 2022).

Data-Driven Decision Making: Real-time analytics and comprehensive reporting capabilities provide actionable business intelligence for inventory optimization, pricing strategies, and customer behavior analysis (Davenport & Harris, 2023).

Customer Experience Enhancement: Self-service capabilities, transparent order tracking, and convenient payment options improve customer satisfaction and loyalty (Lemon & Verhoef, 2020).

Scalability: Digital infrastructure accommodates business growth without proportional increases in operational complexity or staffing requirements (Laudon & Laudon, 2020).

Conclusion and Recommendations

Conclusion

This research successfully designed and validated a web-based sales information system addressing critical operational challenges at Andre Florist. Key findings include:

1. Efficiency Improvement: The web-based architecture significantly enhances transaction processing efficiency through automated data capture, validation, and storage mechanisms, eliminating manual documentation bottlenecks.
2. Data Management Enhancement: The system provides structured storage for transactions, products, and sales analytics, enabling sophisticated business intelligence and performance monitoring capabilities previously unavailable through manual processes.
3. Functional Validation: Comprehensive Black Box Testing demonstrated that all system functionalities operate according to specifications, confirming readiness for production deployment and actual business utilization.

Recommendations

For Andre Florist Management

1. Payment Integration: Implement digital payment gateways including QRIS (Quick Response Code Indonesian Standard), virtual accounts, and credit card processing to facilitate seamless transaction completion and reduce payment friction (Ozturk, 2020).
2. Responsive Design Implementation: Ensure mobile-responsive interface design to accommodate increasing mobile commerce trends and provide consistent user experiences across diverse devices and screen sizes (Chaffey & Ellis-Chadwick, 2022).
3. Customer Relationship Management (CRM): Integrate CRM functionalities including customer communication histories, preference tracking, and targeted marketing campaign capabilities to enhance customer retention and lifetime value (Buttle & Maklan, 2021).
4. Analytics Dashboard Expansion: Develop advanced analytical dashboards providing insights into customer behavior patterns, product performance metrics, seasonal trends, and predictive forecasting to support strategic planning (Davenport & Harris, 2023).

For Future Research

1. Performance Optimization Studies: Investigate system performance under high-traffic conditions and develop optimization strategies for scalability and response time enhancement.
2. Security Enhancement Research: Explore advanced cybersecurity measures including penetration testing, vulnerability assessments, and compliance with data protection regulations (Stallings & Brown, 2023).
3. Artificial Intelligence Integration: Examine opportunities for implementing AI-driven features such as personalized product recommendations, chatbot customer service, and demand forecasting algorithms (Russell & Norvig, 2021).
4. Omnichannel Strategy Development: Research integration approaches connecting online and offline sales channels for seamless customer experiences across multiple touchpoints (Verhoef et al., 2021).

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