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Information System to Support Canvassing Activities

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Abstract: ***In the era of Industry 4.0 and the increasingly competitive business landscape, operational efficiency has become a decisive factor in sustaining corporate competitiveness. X Store, a Business-to-Business (B2B) distributor specializing in electronics and household appliances, faced severe operational challenges stemming from fully manual administrative processes. Identified problems included delayed sales recording (performed monthly instead of real-time), duplicate purchase orders, lost invoices and delivery notes, inaccurate inventory tracking across two warehouses, undocumented return and service workflows, and unstructured canvassing activities where sales teams carry physical stock to customer locations without systematic tracking. This study designed and implemented an integrated web-based administrative information system to address all identified challenges. The system encompasses nine core modules: sales, purchasing, inventory, payment, delivery, expenses, return/service, canvassing, and reporting, with role-based access control. The development methodology encompassed literature review, business process analysis, system design, iterative implementation, and two-phase evaluation (scenario-based testing and UAT). All scenario tests produced outcomes consistent with expected behaviour. A satisfaction survey conducted with X Store administrative personnel yielded an average UAT score of 4.375 out of 5, indicating strong user acceptance. Quantitative performance comparison demonstrated transformative efficiency improvements across eleven operational metrics, including elimination of duplicate orders and lost invoices, and reduction of profit/loss report generation time from over three working days to under two minutes.***

Keywords: Administrative Information System, B2B Distribution, Canvassing

I. INTRODUCTION

The rapid advancement of digital technology in the era of Industry 4.0 has fundamentally transformed how modern enterprises manage their operations. The integration of digital systems into business processes has shifted from a competitive advantage to an operational necessity, particularly in distribution sectors where transaction volumes, inventory complexity, and multi-party coordination demands are high. According to Laudon and Laudon [1], information systems have become indispensable tools for supporting operational management, coordination, and decision-making within organizations. Research has further demonstrated that the digitalization of company systems positively impacts employee performance and organizational efficiency, particularly when combined with adequate user satisfaction and system usability [2]. Furthermore, the implementation of web-based information systems has proven critical in addressing specific logistical bottlenecks, such as manual inventory tracking and real-time transaction reporting, which are common hurdles in modern retail and distribution environments [3, 4]. These operational limitations often lead to data inconsistencies and significant reporting delays that severely hinder managerial decision-making [5].

Business-to-Business (B2B) distribution companies face unique administrative challenges that distinguish them from retail-facing businesses. In B2B models, transactions involve bulk orders, complex negotiated payment terms (e.g., net 30, net 60), multi-step delivery and receipt processes, ongoing vendor relationship management, and extensive documentation requirements. These characteristics demand precise data management, real-time visibility, and tightly integrated administrative workflows that manual processes cannot reliably provide.

X Store, an electronics and household appliance distributor operating under a B2B model, exemplifies these challenges. Despite managing a dual-warehouse operation and serving multiple retail business partners across regions, the company conducted all administrative functions manually, from sales recording and inventory management to canvassing coordination and return processing. The company operated without any centralized data system, relying on handwritten records, spreadsheets, and verbal communication between departments. These reliance on legacy methods exacerbated issues such as inconsistent inventory tracking and document loss, mirroring the systemic operational inefficiencies found in traditional distribution sectors transitioning toward digital maturity.

Empirical studies have consistently demonstrated that manual administrative processes in small and medium-sized enterprises contribute to significant operational bottlenecks, including slow processing speeds, data inaccuracies, and diminished decision-making capacity [6, 7]. Specifically, in field service and canvassing environments, the absence of integrated, mobile-enabled inventory management tools frequently leads to stock discrepancies, lost revenue opportunities, and suboptimal resource allocation [8, 9]. Furthermore, the lack of real-time connectivity between sales representatives in the field and the central warehouse frequently results in the issuance of inaccurate orders and a disconnect in inventory availability [10, 11]. Recent evidence from the building materials distribution sector further highlights that reliance on manual handling for historical data, billing, and approvals severely compromises operational accuracy and organizational responsiveness [12].

Structured stakeholder interviews and business process observation identified the following operational problems at X Store: (1) sales recording delayed by one to two months, causing loss of critical documents such as invoices and delivery notes; (2) duplicate purchase orders arising from the absence of order tracking and status visibility; (3) inefficient stock verification requiring physical warehouse inspection for every incoming order; (4) unstructured canvassing activities with no systematic inventory tracking for goods carried by sales teams to customer locations; (5) undocumented return and service processes creating audit and accountability gaps; (6) expense recording lacking structured approval controls; and (7) delayed customer billing and duplicate vendor payments negatively affecting cash flow and inter-company trust.

Canvassing, in particular, represents a B2B-specific operational challenge that has received limited attention in administrative information systems literature. When sales personnel travel with physical stock to customer locations, the carried inventory must be segregated from available warehouse stock to prevent double allocation. All transactions made during the canvassing trip must be systematically recorded with associated invoices, and unsold items must be precisely reconciled back to inventory upon return. Without a structured management tool, this process is highly susceptible to stock discrepancies, revenue leakage, and documentation errors. Moreover, the lack of real-time synchronization during these field operations often forces companies to rely on post-hoc reconciliation, which significantly inflates administrative overhead and compromises financial reporting integrity [13, 14]. As manual reconciliation processes remain prevalent in traditional distribution models, they frequently lead to data inconsistencies, increased backlogs, and delayed financial reporting [15]. Research indicates that implementing automated, real-time data synchronization frameworks is essential for reducing manual intervention, minimizing human error, and ensuring the accuracy of financial records across complex B2B transaction landscapes [16]. Furthermore, without integrated digital solutions, enterprises struggle to maintain audit traceability, further undermining organizational accountability and responsiveness in dynamic market environments [17].

This research addresses these challenges by designing and implementing a comprehensive web-based administrative information system for X Store. The primary research contributions are: (1) an integrated Administrative Information System (AIS) covering nine business modules within a unified Django-React-MySQL web platform; (2) a novel canvassing management module with automated on-hold inventory allocation, integrated sales order creation, and multi-status workflow tracking; (3) a role-based access control framework specifically designed for B2B distribution operational roles; and (4) empirical evidence of operational efficiency improvements through scenario-based testing and User Acceptance Testing (UAT).

The remainder of this paper is organized as follows: Section II presents the theoretical literature review; Section III discusses related work with comparative analysis; Section IV outlines the research methodology; Section V describes system analysis and design; Section VI covers system implementation; Section VII presents testing and evaluation results; and Section VIII concludes the paper.

II. LITERATURE REVIEW

A. Administrative Information Systems

An Information System (IS) is defined as a set of interrelated components that collect, store, process, and distribute information to support decision-making, coordination, and organizational control. Information systems extend beyond hardware and software to encompass human actors, organizational procedures, and institutional processes. In business contexts, IS enables systematic management of transactions, inventory, customer relationships, and financial records. Effective IS adoption provides organizations with real-time data and analytical capabilities that support faster, more accurate decision-making, enabling companies to respond efficiently to dynamic market demands and maintain operational responsiveness [1].

The relationship between IS quality, user satisfaction, and organizational performance is well-established in the literature. Shidqi et al. [2] demonstrated that the digitalization of company information systems positively impacts employee performance, with job satisfaction serving as a mediating variable.

This finding underscores that successful IS implementation requires not only technical soundness but also deliberate attention to user experience and interface design. Systems that fail to achieve user acceptance often suffer from underutilization, negating potential operational benefits.

An Administrative Information System (AIS) is a specialized form of IS designed specifically to support organizational administrative activities, encompassing the collection, processing, storage, and distribution of administrative information. Turban et al. [18] describe AIS as a key enabler of operational efficiency that supports functions including financial management, procurement administration, inventory control, document management, and compliance reporting. By automating routine administrative tasks, AIS reduces organizational dependence on manual processes, minimizes human error, accelerates reporting cycles, and provides management with timely, accurate information for decision-making.

In the context of Indonesian distribution businesses, many small and medium enterprises continue to rely on manual administrative systems due to cost constraints or limited digital literacy. This reliance creates operational vulnerabilities, including data loss, delayed financial reporting, inaccurate inventory counts, and inefficient financial management. Prior studies have demonstrated that well-designed AIS implementations significantly improve administrative accuracy and workflow efficiency, with positive outcomes reported in retail [19], distribution [20], and electrical goods [21] business contexts.

B. Canvassing in B2B Distribution Contexts

In B2B distribution, canvassing typically involves sales personnel traveling to customer premises with physical product inventory to conduct direct sales transactions, often to business partners in different cities or regions. This model provides the advantage of personalized customer engagement and immediate product availability at the point of contact.

The operational complexity of canvassing in B2B distribution arises from the need to maintain inventory integrity during canvassing trips, which may span multiple days and cities. Items loaded for canvassing must be segregated from general available stock to prevent double-allocation to other customers. Operational expenses incurred during canvassing (accommodation, fuel, toll fees, meals) must be documented and approved. Upon trip completion, sold items must be converted to formal sales orders with invoices, while unsold items must be precisely reconciled back to available inventory with updated quantities. Without a structured AIS module to manage this workflow, discrepancies in stock data, revenue leakage, and documentation errors are unavoidable outcomes.

C. Technology Stack for Web-Based AIS

Web-based AIS offers significant operational advantages over desktop-based alternatives, including platform independence, concurrent multi-user access from distributed locations, centralized data management with single source of truth, and ease of maintenance and feature updates without client-side installation. Django, a Python-based web framework following the Model-View-Template (MVT) architecture, provides a robust foundation for backend development with built-in security features (CSRF protection, SQL injection prevention), an Object-Relational Mapper (ORM) for database interaction, and a powerful admin interface for rapid data management. React, a component-based JavaScript library for user interface development, enables the creation of dynamic, responsive frontends with efficient state management through virtual DOM rendering. MySQL provides a reliable, ACID-compliant relational database solution well-suited for transaction-intensive applications requiring referential integrity and complex multi-table query support.

III.RELATED WORK

Several prior studies have addressed the development of administrative information systems for retail and distribution business contexts. Gaghana and Setiabudi [19] developed an AIS for Mulia Sport Store to solve manual recording problems in a retail sports equipment business. The system automated transaction recording for sales, purchases, and returns, included a real-time stock reminder feature for low-inventory alerts, and generated financial reports automatically. Questionnaire-based evaluation confirmed that the system improved operational efficiency and facilitated more accurate profit/loss computation. Key limitations included the desktop-based architecture constraining access to a single workstation and the absence of canvassing or multi-role workflow support.

Febrianto and Minarni [20] specifically addressed canvassing administration in their development of a desktop-based canvasser AIS for PT. Metta Surya. Their system automated payment recording, sales tracking, and goods-in reporting for a canvassing distribution company, significantly reducing manual calculation time and improving report accuracy. However, the system remained limited to desktop use, did not provide web-based multi-user access, and did not integrate canvassing workflows with broader administrative functions such as inventory on-hold state management or role-based financial controls.

Wijaya [21] implemented a desktop-based AIS for Toko Listrik X in Cepu to address manual inventory tracking, return management, and financial reporting deficiencies. The system introduced stock location tracking enabling warehouse staff to identify item positions across multiple storage areas, automated debt payment reminders for vendor obligations, and a unique feature for tracking remaining cable roll lengths by automatic length calculation. Despite improving operational efficiency markedly, the system did not support web-based access, multi-role authorization, or canvassing-specific workflows.

All prior studies employed desktop-based architectures and addressed only partial subsets of B2B distribution administrative requirements. None provided integrated canvassing management with on-hold inventory allocation, web-based concurrent multi-user access, or a comprehensive role-based access control framework. The present research addresses these gaps by delivering a web-based AIS that unifies all B2B distribution administrative modules with a purpose-built canvassing workflow and real-time inventory state management.

IV. RESEARCH METHODOLOGY

This research follows a structured development methodology adapted from the Software Development Life Cycle (SDLC) model, comprising five sequential phases: Literature Review, Business Process Analysis, System Design, System Implementation, and Testing and Evaluation. In the Literature Review phase, relevant academic literature was systematically studied, encompassing information systems theory, AIS design principles, canvassing in B2B distribution, web development frameworks (Django, React, MySQL), and prior AIS implementations. This phase established the theoretical foundation and identified the specific research gap addressed by the present work. The Business Process Analysis phase involved semi-structured interviews with all stakeholder groups at X Store: the owner, administrative and finance staff, sales personnel, warehouse staff, and delivery drivers. These interviews documented the as-is business processes for all operational areas, identified specific pain points and their root causes, and established detailed functional and non-functional requirements for the new system. Business process mapping was conducted to visualize current workflows, identify integration points between departments, and define the boundaries of system responsibility.

The System Design phase produced three categories of structural artifacts. Use Case Diagrams captured actor-system interactions for each of the nine system modules across four user roles. Activity Diagrams documented detailed process flows for twelve key operations: login, add sales, edit sales, add purchase, edit purchase, update payment status, add return/service, add expenses, owner expense approval, canvassing workflow, update delivery status, and add inventory count. The Entity Relationship Diagram (ERD) defined fifteen core database entities and their relationships, forming the data model for the MySQL relational database.

The System Implementation phase translated all design artifacts into a functional web application through iterative development sprints. Each sprint targeted specific modules, with continuous stakeholder review cycles to validate implemented features against requirements before advancing to subsequent modules. The Django backend was developed first to establish the data model and API endpoints, followed by the React frontend and its module-by-module integration with the API.

The Testing and Evaluation phase applied two complementary evaluation methods. Scenario-Based Testing executed fifteen predefined test scenarios covering all system modules, with each scenario defining an input condition, execution steps, expected output, and actual observed outcome. User Acceptance Testing (UAT) administered a structured 5-point Likert scale questionnaire (1=Very Dissatisfied, 5=Very Satisfied) to X Store administrative personnel after a supervised system demonstration covering all modules. The study additionally conducted a quantitative performance comparison by measuring eleven operational time and accuracy metrics under both the previous manual process and the new system.

V. SYSTEM ANALYSIS AND DESIGN

A. Problem Analysis

X Store operates two physical warehouses and manages a supply chain from vendor procurement through customer delivery for electronics and household appliance products. The core business process begins when a salesperson receives a customer order via phone or WhatsApp, manually verifies stock availability by contacting the warehouse team, creates handwritten invoices and delivery notes, and coordinates delivery arrangements. When stock is insufficient, a verbal purchase order is placed with a vendor. Canvassing trips involve informally loading stock onto delivery vehicles for multi-day sales trips to regional customers.

The absence of an integrated information system creates six systemic failure points that manifest as recurring operational problems: (1) transaction documentation gaps caused by monthly-batch recording with paper invoices prone to loss; (2) purchase order duplication due to absent status tracking; (3) inventory inaccuracies from manual stock counting; (4) canvassing inventory discrepancies from informal item tracking; (5) return and service process gaps from verbal-only status communication; and (6) financial control weaknesses from untracked expenses and unmonitored payment due dates.

B. System Requirements

Business process analysis specify that the system must provide: real-time sales order recording with automatic invoice and delivery note generation; purchase order management with vendor reference and goods receipt confirmation; automatic inventory decrement upon sales and increment upon purchase receipt; on-hold inventory allocation for canvassing items with reconciliation upon trip completion; four-stage return and service workflow tracking with timestamp audit trail; multi-category expense recording with owner approval workflow; delivery status monitoring for both outgoing (sales) and incoming (purchase) goods; and automated profit/loss report generation with configurable date range filtering.

Non-functional requirements specify: web-based accessibility from any networked device without client-side software installation; role-based access control enforced at both UI and API levels; data integrity maintained through relational database constraints and transactional operations; responsive interface compatible with desktop and common mobile browser dimensions; system performance supporting concurrent multi-user access without data concurrency errors; and secure authentication with session-based token management.

C. System Architecture and Database Design

The system implements a three-tier web architecture. The presentation layer is a React 18 Single Page Application (SPA) communicating with the backend via RESTful API calls using Axios. The application layer is built with Django 4.2 and Django REST Framework, handling all business logic, JWT-based authentication, role-based authorization middleware, and data processing. The data layer is a MySQL 8.0 relational database maintaining fifteen core entities with referential integrity constraints enforced through foreign key relationships.

The ERD encompasses fifteen core entities: User, Customer, Vendor, ItemCategory, Item, SalesOrder, SalesOrderItem, PurchaseOrder, PurchaseOrderItem, Payment, Expense, ReturnService, Delivery, StockOpname, and Canvassing. Each Item maintains three computed quantity attributes: ready_stock, on_hold, and to_delivery, automatically updated by application layer business logic upon every relevant transaction to ensure real-time inventory accuracy.

D. Key Module Design Details

The Sales module enforces stock validation before saving: if any ordered item's quantity exceeds its ready_stock value, the transaction is blocked with an item-specific error notification. Upon successful save, ready_stock is decremented, an Invoice record is created with the due date calculated from the payment term (e.g., current date + 60 days for Net-60), and a Delivery record is created with status "In Process." Sales orders linked to canvassing are identified via a boolean field referencing the associated Canvassing record ID.

The Canvassing module implements the on-hold inventory state management critical to canvassing accuracy. Upon canvassing record creation, the system atomically transfers quantities from ready_stock to on_hold for all listed items, using database transactions to prevent partial updates. During the canvassing trip, sales created with the canvassing flag decrease on_hold quantities rather than ready_stock, correctly reflecting that the item was physically present during the trip. Upon canvassing completion, a reconciliation routine moves all remaining on_hold quantities (unsold items) back to ready_stock, and the canvassing status is updated to "Completed." All canvassing-associated expenses are linked to the Canvassing record for integrated cost reporting.

VI. SYSTEM IMPLEMENTATION

A. Development Environment and Technology Stack

The system was developed using Python 3.11 with Django 4.2 as the backend framework and Django REST Framework for RESTful API endpoint development. The frontend was implemented using React 18 with functional components, React Hooks (useState, useEffect, useContext) for state management, and Axios for API communication. Bootstrap 5 was used for responsive CSS layout and UI component styling. The MySQL 8.0 relational database was managed through Django's ORM with database migrations maintaining schema version control throughout the development lifecycle. Development tools included VS Code as the IDE, Postman for API testing, and GitHub for version control.

The login interface presents a username and password form with validation. Upon submission, credentials are verified against the database, and on success, a session token is issued and the user is redirected to the role-appropriate home dashboard. Invalid credentials trigger a descriptive error notification without revealing which field contains the error. The dashboard displays key operational summaries: active sales orders, outstanding receivables, pending expense approvals, and current canvassing trips. The

B. Sales and Invoice Processing

The Sales module allows authorized users to create orders by selecting a customer, specifying payment terms and optional expedition service, and adding line items from a searchable item catalog with default prices pre-populated. As items are added, the system dynamically calculates line subtotals and the order total. Upon submission, the backend validates stock availability for each line item before committing the transaction. A successfully saved sales order immediately creates associated Invoice and Delivery records, visible in the Payment and Delivery modules respectively. Invoice generation produces a formatted document with all order details including the payment due date, accessible for WhatsApp sharing.

C. Inventory State Management Implementation

The three-state inventory model (ready_stock, on_hold, and to_delivery) is implemented through coordinated updates across multiple modules. The ready_stock quantity decrements when a sales order is saved and increments upon purchase goods receipt confirmation. The on_hold quantity increases upon canvassing creation and decreases as canvassing sales are recorded or when the canvassing trip is completed and unsold items are returned. The to_delivery quantity reflects items in confirmed sales orders awaiting physical dispatch. All state transitions are executed within database transactions to ensure atomicity. The Inventory module provides warehouse staff with a real-time view of all three quantity states per item, giving accurate visibility into physically available stock versus committed inventory.

VII. TESTING AND EVALUATION

A. Scenario-Based Testing

Fifteen scenario tests were executed across all system modules, each specifying an input condition, execution steps, expected outcome, and observed result. Table I presents a summary of all scenario test cases and their results.

TABLE I
SCENARIO-BASED TESTING SUMMARY

No.	Module	Test Scenario	Expected Outcome	Result
1	Login	Valid/invalid credential submission	Role-appropriate dashboard; error notification for invalid credentials	Pass
2	Master Data	Add customer, vendor, item, expedition	Records stored and visible in respective list pages	Pass
3	Add Sales	Sales order with sufficient/insufficient stock	Order saved with invoice generated; blocked if stock insufficient	Pass
4	Payment Update	Partial then full payment recording	Status: Unpaid→Partial→Paid; removed from queue when paid	Pass
5	Add Purchase	Purchase order with vendor and items	PO saved; goods receipt increments inventory ready stock	Pass
6	Delivery Update	Status change from In Process to Completed	Delivery status updated; reflected in sales order detail view	Pass
7	Add Expenses	Expense entry with category and amount	Saved as Pending Approval; appears in owner approval queue	Pass
8	Owner Expense Approval	Owner checks approve on pending expense	Status changes to Approved; included in Profit/Loss calculation	Pass
9	Add Canvassing	Create canvassing with items and personnel	Items transferred to on_hold; canvassing record created	Pass
10	Canvassing Sale	Sales order flagged as canvassing	On_hold quantity decremented; sales order linked to canvassing ID	Pass
11	Canvassing Completion	Mark canvassing as complete	Unsold items returned from on_hold to ready_stock	Pass
12	Add Return/Service	Create return with stage tracking	Record saved; four workflow stages tracked with timestamps	Pass
13	Stock Opname	Record physical inventory count	Opname saved with date, employee, and per-item quantities	Pass
14	Inventory State Check	Verify on_hold after canvassing creation	on_hold correctly reflects carried quantities in real-time	Pass
15	Profit/Loss Report	Generate report for date range	Aggregated revenue, COGS, and expenses displayed accurately	Pass

As shown in Table I, all fifteen test scenarios produced outcomes exactly consistent with expected behaviour, yielding a 100% pass rate. Particularly significant was Scenario 14 (Inventory State Check), which validated the canvassing on-hold mechanism: a canvassing trip (CV-2) loaded with 35 units of item STB001 immediately reflected an on-hold quantity of 35. After recording a sales order for 3 units linked to CV-2, the on_hold quantity correctly updated to 32 units, with ready stock decremented by 3 units. This confirmed precise real-time inventory state management across the canvassing and sales modules under concurrent transaction conditions.

Scenario 3 (Add Sales) validated the stock enforcement mechanism: when a sales order was attempted for a quantity exceeding available ready stock, the system correctly blocked the save operation and displayed an item-specific error notification identifying the over-allocated item. This prevents overselling and maintains inventory integrity without requiring manual pre-checking by staff.

B. User Acceptance Testing Results

Following scenario testing and a supervised demonstration of all system modules, X Store administrative personnel conducted UAT using the structured questionnaire. Table II presents the complete survey results with per-item scores.

TABLE II
USER ACCEPTANCE TESTING (UAT) SURVEY RESULTS

No.	Feature Evaluated	Score (1–5)
1	Website interface ease of understanding	4
2	Sales feature helpfulness in recording and tracking transactions	5
3	Purchase feature helpfulness in procurement and vendor management	5
4	Inventory module for real-time stock management (ready, on-hold, to-delivery)	4
5	Payment tracking for customer receivables and vendor payables	5
6	Delivery status monitoring for outgoing and incoming goods	4
7	Return/service process management and status tracking	4
8	Reporting module for profit/loss and operational data generation	3
	Overall Average	4.375

The system achieved an overall average UAT score of 4.375 out of 5, indicating strong user acceptance across all evaluated features. The Sales, Purchase, and Payment modules received the highest scores (5=Very Satisfied), reflecting their direct, daily operational impact and the respondents' clear recognition of improvement compared to the prior manual process. These three modules collectively eliminate the most time-consuming and error-prone manual tasks: monthly transaction reconciliation, purchase order duplication, and payment tracking by spreadsheet.

The Inventory, Delivery, and Return/Service modules received scores of 4 (Satisfied). Users expressed appreciation for real-time stock visibility and the structured delivery status tracking, while suggesting that the return/service module interface could benefit from additional visual status indicators to make the four-stage workflow more immediately legible.

The Reporting module received a score of 3 (Neutral). This result is primarily attributed to the limited transaction data accumulated during the short testing period, which constrained the respondents' ability to experience the full analytical value of the profit/loss report. The neutral score does not indicate dissatisfaction with report accuracy or functionality, but rather reflects that the report’s practical utility is directly proportional to the volume of historical transaction data available for aggregation. As the system accumulates production data over operational months, the reporting module’s value is expected to increase substantially.

C. Performance Comparison

A quantitative performance comparison was conducted by measuring eleven operational metrics under both the previous manual process and the new system. Pre-implementation baseline data was obtained through structured stakeholder interviews and time-and-motion observations. Post-implementation metrics were obtained through timed execution of equivalent operations in the system. Table III presents the complete comparison results.

TABLE IIII
QUANTITATIVE PERFORMANCE COMPARISON: MANUAL PROCESS VS. SYSTEM

No.	Operational Metric	Before System	After System
1	Monthly Sales Recapitulation Time	~2 Working Days	<2 Minutes
2	Purchase Order (PO) Creation Time	10–20 Minutes	<5 Minutes
3	Stock Availability Checking	10–20 Minutes	<2 Minutes
4	Sales Order Delivery Status Tracking	5–10 Minutes	<2 Minutes
5	Customer Payment Status Tracking	5–10 Minutes	<2 Minutes
6	Return/Service Process Tracking	5–10 Minutes	<2 Minutes
7	Duplicate Orders & Lost Invoices (monthly)	0–1 duplicate; 0–2 lost invoices	0 Cases
8	Canvassing Item Status Tracking	~15 Minutes	<2 Minutes
9	Stock Data Accuracy (discrepancy estimate)	5%–10%	<5%
10	Profit/Loss Report Generation	>3 Working Days	<2 Minutes
11	Debt & Receivable Due Date Visibility	5–10 Minutes	<2 Minutes

The performance data in Table III reveals improvements that go beyond incremental efficiency gains and represent fundamental changes in the operational model. The reduction of monthly sales recapitulation from approximately two working days to under two minutes is not merely a time saving, it transforms the nature of sales reporting from a periodic, resource-intensive activity into an on-demand capability available to the owner at any moment. This shift enables reactive business management to become proactive data-driven management. The complete elimination of duplicate purchase orders (previously 0–1 case monthly) and lost invoices (previously 0–2 cases monthly) demonstrates that the system effectively closes the primary documentation control gaps identified in the problem analysis. These were not merely inconveniences, duplicate purchase payments directly caused financial losses, while lost invoices created irrecoverable revenue gaps and complicated vendor relationships.

The canvassing-specific improvements highlight the value of purpose-built module design. Canvassing item status tracking time decreased from approximately 15 minutes of manual cross-referencing to under two minutes of system query. The on-hold inventory mechanism eliminates the entire category of canvassing-related stock discrepancies by design, rather than attempting to detect and correct discrepancies after the fact. This preventive approach to data integrity represents a qualitatively superior solution compared to post-hoc error correction.

The stock data accuracy improvement from 5–10% estimated discrepancy to below 5% reflects the cumulative effect of automated inventory updates across all transaction types. In a distribution business where inventory represents the primary asset, even a 5% improvement in stock accuracy translates directly to reduced over-ordering costs, improved customer service levels from reliable stock availability information, and more accurate financial reporting.

VIII. CONCLUSIONS

This research successfully designed, implemented, and evaluated a comprehensive web-based administrative information system for X Store, a B2B electronics and household appliance distributor. The integrated system unifies nine operational modules: sales, purchasing, inventory, payment, delivery, expenses, return/service, canvassing, and reporting, accessible to four defined user roles under a role-based access control framework.

Scenario-based testing across fifteen test cases confirmed 100% functional correctness, with all modules producing outcomes consistent with expected behavior under both normal and boundary conditions. The three-state inventory model, namely ready_stock, on_hold, and to_delivery, proved effective in maintaining inventory integrity during canvassing operations, the research's primary technical contribution. User Acceptance Testing yielded an overall average satisfaction score of 4.375 out of 5, indicating strong user acceptance across core operational features. Quantitative performance comparison across eleven operational metrics demonstrated transformative efficiency improvements, with the majority of processes reduced from hours or working days to under two minutes, and the complete elimination of previously recurring operational errors including duplicate orders, lost invoices, and canvassing stock discrepancies.

The canvassing module represents the primary novel contribution of this research to the AIS literature for B2B distribution. By providing automated on-hold inventory allocation, integrated sales order creation linked to canvassing records, four-stage return/service tracking, and integrated expense management, the system addresses an operationally significant challenge that prior AIS research has not comprehensively addressed in a web-based, multi-module context.

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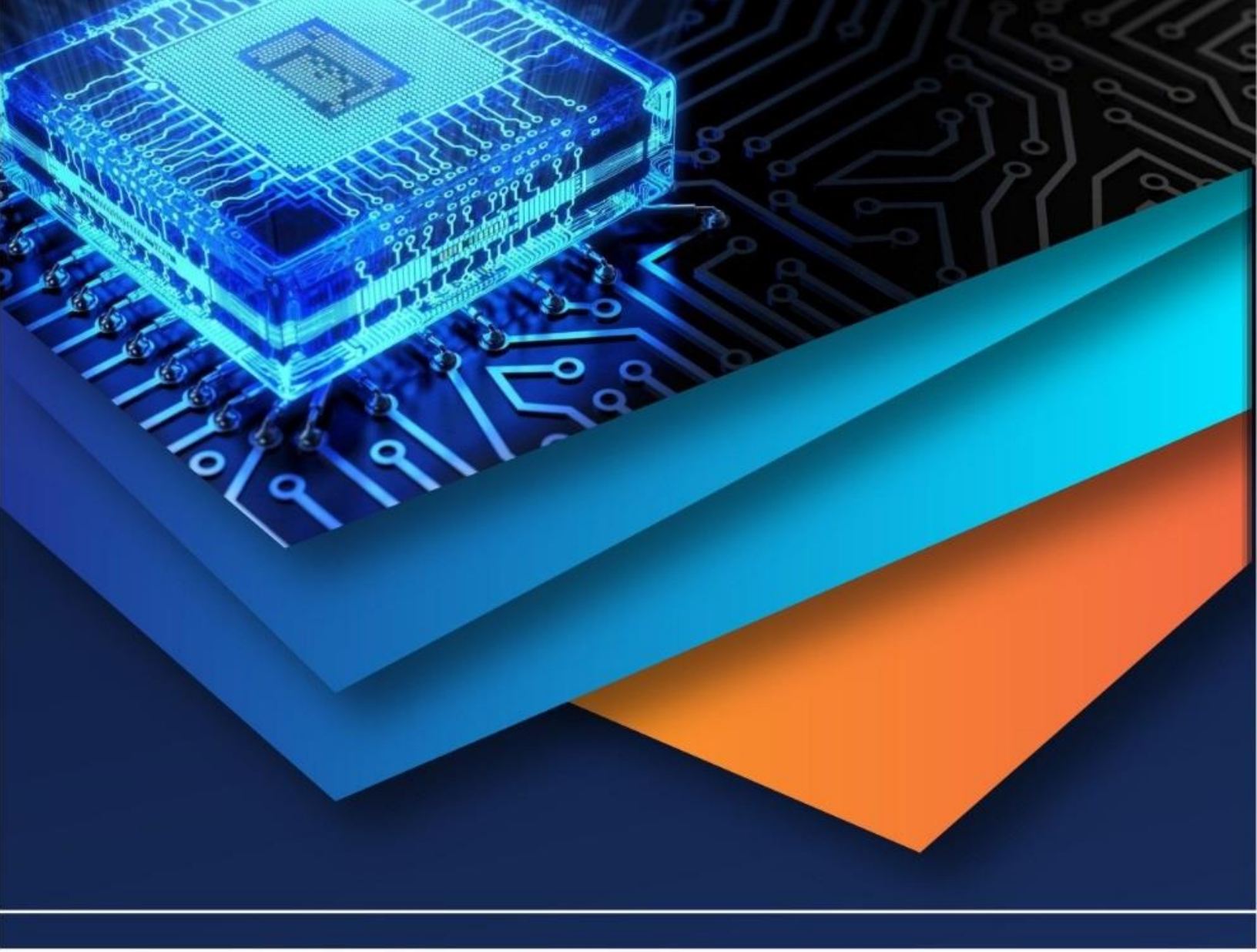

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