ASIAN INSTITUTE OF COMPUTER STUDIES
Commonwealth Branch
Computer Science Department

Development of a Computerized Order Management System for Edzel Samantha Department Store at Ilang-Ilang Street, Payatas A

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Professor

PRELIMINARY PAGES

Table of Contents

CSE311 – CS Elective 1

Computer Science Final Mini Project – System Defense Criteria

CRITERIA	POINTS	REMARKS
1. Technical Content (40%) • System Design & Architecture (15%) – clear structure, correct use of technologies, proper documentation (ERD, DFD, UML, etc.) • Implementation & Functionality (15%) – working prototype/system, meets stated objectives, minimal errors. • Innovation & Problem-Solving (10%) – originality, creativity, and real-world application of the system.		
2. Presentation & Defense (30%) ● Clarity of Presentation (10%) – organized flow, concise explanation of concepts, effective use of slides/demos. ● Defense & Q&A (15%) – ability to justify design choices, handle panel questions confidently. ● Teamwork & Participation (5%) – equal participation of members during defense.		
3. Documentation (20%) ● Completeness (10%) – includes title page, abstract, objectives, methodology, results, references, appendices. ● Formatting & Organization (5%) – proper formatting, grammar, spelling, and professional layout. ● Citation & References (5%) – correct use of references/sources.		
4. Professionalism & Formal Attire (10%) ● Formal Attire (5%) – neat, professional dress code (barong/polo/slacks for men; blouse/blazer/skirt or slacks for women). ● Professional Demeanor (5%) – punctuality, respectful manner, confident posture and speech.		
Total: (100%)		

Individual Grade: **Signatures with Date:**

Leader: **Perez,Vander**. _____ _____

Members: **Solayao,Emanuel** _____ _____

Tomes,Ruzzel. _____ _____

Villanueva,Mark Joshua _____ _____

Comments and Suggestions:

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CHAPTER 1 – INTRODUCTION

The **Development of a Computerized Order Management System for Edzel Samantha Department Store at Ilang-Ilang Street, Payatas A** is a browser-based designed to help small to mid-sized department stores improve their sales and transaction processes and many stores today still rely on manual methods that often lead to errors, delays, and confusion in managing sales records. This study aims to solve these problems by providing a digital system that makes daily operations faster, more accurate, and more organized. Receipts, the system ensures smoother work flow and more reliable store management.

The system focuses on simplicity, efficiency, and accessibility. Since it is browser-based, it can be accessed through any computer without the need for complicated installation. Authorized cashiers can log in securely to process transactions, manage orders, and print receipts instantly. This improves the overall checkout experience for customers while reducing the workload for employees. The system also minimizes human errors that often occur in manual processes, making transactions more accurate and secure.

Overall, this study serves as a modern solution to traditional sales management challenges. It helps department stores operate more efficiently by integrating sales, inventory, and reporting functions into one system. Store owners can monitor business performance in real-time, improve customer satisfaction, and maintain accurate financial records. Ultimately, the system promotes digital transformation and supports the growth of small to mid-sized department stores in a competitive retail environment.

1.1 Background of the Study

Department stores are key retail establishments offering a wide variety of consumer goods. Historically, their operations were managed through manual, paper-based processes, which were slow, prone to errors, and inefficient. This often resulted in inventory variation, delayed transactions, and financial inaccuracies, hindering both operational growth and customer satisfaction.

The shift to computerized systems has revolutionized this landscape. These integrated platforms, like the **Computerized Order Management System**, centralize core operations such as sales, inventory, and billing. By automating these processes, stores can track stock in real-time, speed up checkouts, and ensure data accuracy, leading to a significantly improved customer experience.

This transition to technology is now essential for competitiveness. Modern systems provide valuable data insights that guide strategic decision-making. Therefore, implementing an efficient and automated order management system is crucial for any department store aiming to achieve operational excellence and sustainable growth in the digital age.

1.2 Statement of the Problem

The current manual process at Edzel Samantha Department Store at Ilang-Ilang Street, Payatas A creates significant challenges, resulting in **slow transactions**, frequent **pricing errors**, and a consistently **poor customer experience**. Without an automated system, cashiers must manually write each item, which not only slows down the checkout line but also increases the likelihood of human error. This lack of an instant **product preview** means customers can't verify their items before payment, and the absence of a real-time digital receipt adds to the frustration. The overall result's a complicated, inefficient, and often inaccurate process that reduce customer satisfaction and negatively impacts the store's reputation. This outdated system highlights an urgent need for a technological upgrade to streamline operations and improve service.

1.3 Objective of the Study

General Objective:

The main goal of this study is to streamline and automate the process of managing customer orders, inventory, and sales transactions to improve efficiency, accuracy, and customer satisfaction within the store's operations.

Specific Objectives:

- To design a user-friendly system that enables efficient processing and tracking of customer orders.
- To generate detailed sales and inventory reports for effective business monitoring and decision-making.
- To enhance overall customer satisfaction by reducing errors and improving order accuracy and speed.

1.4 Significance of the Study

For the Department Store

The study will help the store identify and address operational inefficiencies caused by manual processes. By implementing a computerized order and inventory system, the store can improve accuracy, speed, and profitability. It will also serve as a blueprint for adopting new technologies, allowing the business to stay competitive and organized.

For the Employees

Employees will benefit from reduced workload and fewer repetitive tasks. Automated systems for inventory tracking, order processing, and record-keeping will minimize human error and save time. This will allow employees to focus more on customer service and other value-adding tasks, improving their productivity and job satisfaction.

For the Customers

Customers will enjoy faster and more reliable transactions, accurate product availability information, and possibly reward or loyalty programs made possible by the computerized system. These improvements will enhance the overall shopping experience and increase customer satisfaction.

1.5 Scopes and Delimitations

The scope of this study is to examine the operations of Edzel Samantha Department Store, which currently operates without a computerized system. The research will focus specifically on sales tracking and customer transactions. Data will be collected through a combination of observations and record analysis. This study is delimited in several ways. It will not recommend a specific new system or conduct a full financial audit. The findings will apply only to this particular department store and cannot be generalized to other businesses. Furthermore,the study will not explore the long-term effects of implementing a computerized system.

1.6 Definition of Terms

Automation - The use of technology to perform tasks automatically, reducing manual work and human error.

Customer Satisfaction - The level of happiness and fulfillment customers feel toward the store's service speed and accuracy; automating tasks such as recording sales, updating inventory, and get

Order management system (OMS) - is a digital way to manage the lifecycle of an order. It tracks all the information and processes, including order entry, inventory management, fulfillment, and after-sales service. An OMS offers visibility to both the business and the buyer. Organizations can have near real-time insight into inventories and customers can check that when an order will arrive.

CHAPTER 2 - REVIEW OF RELATED LITERATURE AND SYSTEMS

2.1 Review of Related of Literature

The importance of effective order management within the broader scope of supply chain management is well documented. Studies show that when companies handle order processing, inventory tracking, and fulfilment in a responsive and integrated manner, customer satisfaction increases significantly (Wang & Jotikasthira, 2024). For example, in their quantitative study, Wang and Jotikasthira found that service quality, delivery time, and price transparency all supply chain-efficiency factors have a statistically significant positive effect on customer satisfaction.

Likewise, the role of supply chain management (SCM) in creating value for customers is emphasized in other research. Ojoajogu et al. (2021) explored dimensions such as supplier commitment, trust and conformity, and concluded that a coordinated approach among sales, purchasing, production and distribution helps meet customer needs profitably. Specifically, the study found that timely material supply and effective inventory size management were positively associated with higher end-customer satisfaction.

In the context of e-commerce and order fulfilment, literature highlights the role of efficient infrastructures (warehousing, picking, packing) in delivering customer satisfaction and operational cost savings. For instance, Li, Zhang & Jiang (2022) conducted a literature review of order-picking efficiency in e-commerce warehouses and revealed that picking and travel time comprise a major cost component (~55% of warehouse operating cost) and that improving picking strategies is key to faster order fulfilment.

Automation and real-time inventory updates are also well documented as enablers of accuracy and speed in order processing. For example, a recent study on e-commerce inventory optimization using the Random Forest algorithm found improved accuracy in preventing stock-outs thus supporting smoother fulfilment and higher customer satisfaction. Furthermore, IoT and digitalization in inventory management are emerging as important factors for responsiveness in modern supply chains.

Another branch of literature addresses ordering systems in a food or service context. A study proposing an online food ordering system highlighted how replacing manual ordering and queuing with digital platforms improves customer convenience, order accuracy and tracking. However, there is a gap: specific systems that integrate recipe

recommendation and ingredient quantification with ordering and delivery have not been widely studied. A foundational work by Teng, Lin & Adamic (2011) on “Recipe recommendation using ingredient networks” explored how ingredient-networks can help recommend recipes based on co-occurrence and substitution of ingredients, but did not focus on order processing or fulfilment logistics.

2.2 Review of Related Systems

Several studies have examined the role of web-based systems and forecasting technologies in improving business operations and decision-making. Rahman, Abdullah, and Rahim (2023) developed a *Web-Based Inventory and Ordering Management System* for small enterprises, highlighting how digital ordering platforms streamline processes, minimize manual errors, and enhance overall efficiency. Their findings revealed that integrating web technology significantly improved order tracking, stock monitoring, and customer satisfaction. Similarly, Sari and Nugroho (2022) implemented a *Cloud-Based Ordering and Inventory System* for small retailers, which automated sales and inventory updates. The study showed that automation not only reduced human error but also provided business owners with real-time insights into stock levels and order trends.

Forecasting has also been widely studied as an essential tool for improving operational efficiency and strategic planning. Patel and Mehta (2021) designed a *Sales Forecasting Model* using time-series analysis and exponential smoothing techniques, which accurately predicted future demand for small retail businesses. Their research demonstrated that data-driven forecasting models help optimize stock levels and minimize inventory shortages. In a similar vein, Hassan and Othman (2023) proposed a *Machine Learning-Based Demand Forecasting System* using regression and moving average methods. Their study found that integrating predictive analytics into ordering systems allows businesses to anticipate demand fluctuations and improve inventory decisions, thereby reducing costs and waste.

Further studies emphasize the benefits of combining forecasting and ordering functions in a single platform. Nguyen et al. (2022) developed a *Web-Based Ordering System with Predictive Inventory Control* for start-up restaurants, which utilized historical sales data to forecast ingredient demand. The study reported increased order fulfillment speed and improved customer satisfaction due to accurate inventory predictions. Likewise, Lopez

and Cruz (2024) analyzed the impact of integrating machine learning algorithms into small business management systems, concluding that automation and data analytics improve responsiveness to customer needs and support long-term growth.

Lastly, Kumar and Sharma (2023) investigated the effects of implementing digital forecasting tools on business performance among micro and small enterprises. Their results showed significant improvements in sales planning, inventory turnover, and operational efficiency. Collectively, these studies underscore the importance of integrating web-based ordering and forecasting systems to enable data-driven decision-making, reduce operational inefficiencies, and enhance customer satisfaction. However, most existing studies focus on either order management or forecasting individually. The present research addresses this gap by developing an integrated system that combines both functionalities, providing start-up businesses with a comprehensive tool for efficient operations and sustainable growth.

2.3 Synthesis

The reviewed literature and studies consistently highlight the benefits of technology integration in business operations, including improved order management, inventory control, and customer satisfaction. Recipe recommendation systems, automated inventory tracking, and predictive analytics have all been shown to enhance operational efficiency and reduce errors. However, most existing systems address these aspects independently. There is limited research that **integrates web-based ordering, predictive forecasting, and inventory management into a single, comprehensive platform**, particularly for start-up businesses. Current systems often lack simultaneous real-time order management, quantitative ingredient tracking, and demand prediction elements critical for reducing waste, optimizing stock, and ensuring timely delivery.

The present study addresses this gap by developing a **browser-based ordering system with integrated sales tracking and inventory management**, providing the Edzel Samantha Department Store's with a holistic, data-driven solution. By combining insights from both literature and empirical studies, this study bridges the theoretical understanding of technology adoption with practical applications in small business operations. The proposed system aims to streamline order processing, improve inventory control, reduce operational costs, and enhance customer satisfaction, offering a sustainable and scalable solution for a department store.

CHAPTER 3 - METHODOLOGY / SYSTEM DESIGN

3.1 Research Design

This study will utilize a **descriptive research design** to examine the current transaction interactions and the flow of data among the three main components of the system: the customer, the cashier, and the DRFCOMS (Department Store Order Management System). The research aims to provide a detailed account of a complete transaction, from item selection to receipt issuance. Data will be gathered through **document analysis**, reviewing existing materials such as system manuals, flowcharts, and transaction records to understand the planned workflow, and **observation**, where real-time transactions will be directly monitored to compare actual practices with the documented process. This approach allows for a clear, step-by-step understanding of the system's operations, identifying potential gaps and areas for improvement.

3.2 Conceptual Framework

The figure above illustrates the process flow of the **Edzel Samantha Department Store Computerized Order Management System**. The system connects three main components the **Customer**, the **DCOMS**, and the **Cashier** to ensure a smooth and efficient transaction process.

1. Customer → (Pick Item)

The process begins when the customer selects the items they wish to purchase. The selected items are recorded in the **DCOMS** for monitoring and processing.

2. DCOMS→ Cashier (Payment)

Once the items are confirmed, the **DCOMS** sends the order details to the cashier for payment processing. The cashier verifies the total cost and payment method through the system.

3. Cashier → (Checking)

The cashier checks and validates the payment transaction. After confirmation, the **DCOMS** updates the record to reflect that the payment has been completed.

4. Customer → (Print Receipt)

After the transaction is finalized, the DCOMS generates and prints an official receipt for the customer, completing the transaction process

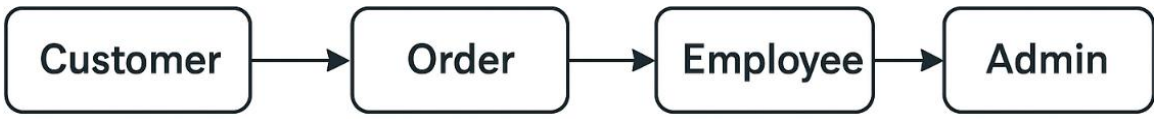
3.4 Data Flow Diagram:

This diagram illustrates the process of a customer making a purchase within a system, which appears to be a Department Store Ordering System (DSOS). It shows the flow of information and interactions between three main entities: the Customer, the DSOS, and the Cashier.

3.5 Entity Relationship Diagram

The Entity Relationship Diagram shows how data entities

Main Entities and Relationships



3.6 Tools and Technologies Used

Category	Tools / Technologies
Programming Language	JavaScript,Html,Css
Development Tool	Visual Studio Code
Operating System	Windows 10

3.7 System Modules and Functions

Login and Authentication Module

Ensures secure access for admin and employees.

Order Management Module

Records and tracks customer orders, including item quantity and total amount.

Payment Module

Handles billing, records payments, and generates receipts.

Report Generation Module

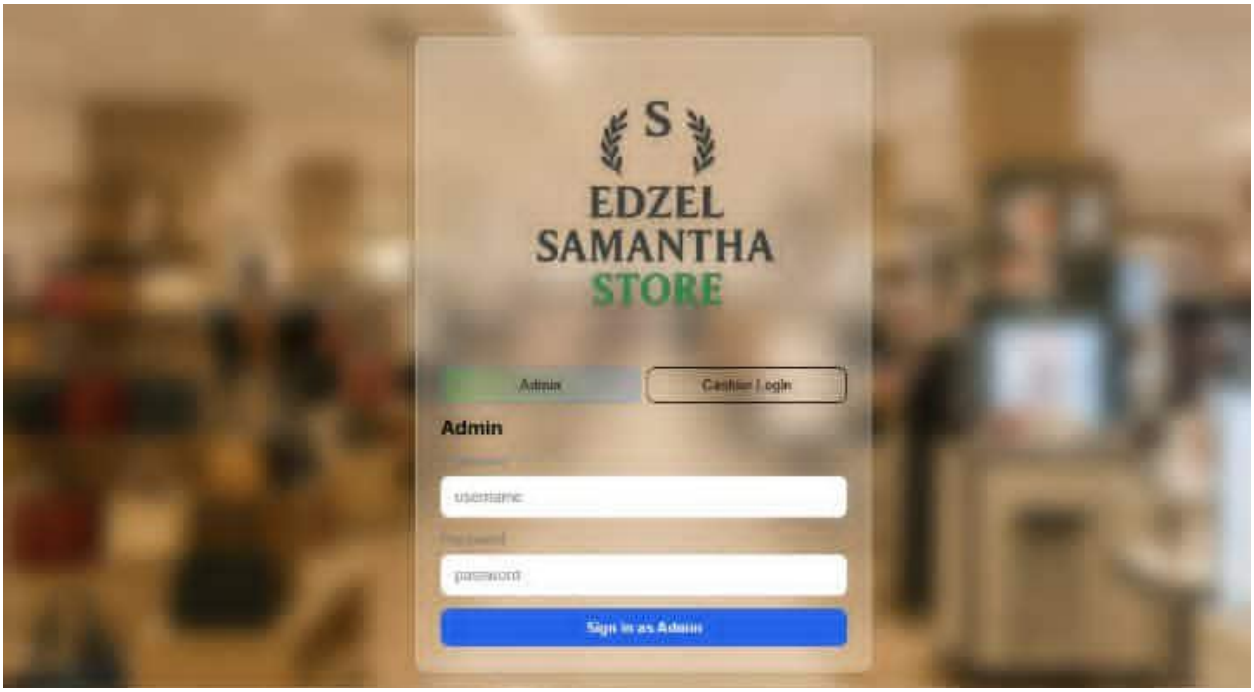
Provides sales, inventory, and order summary reports.

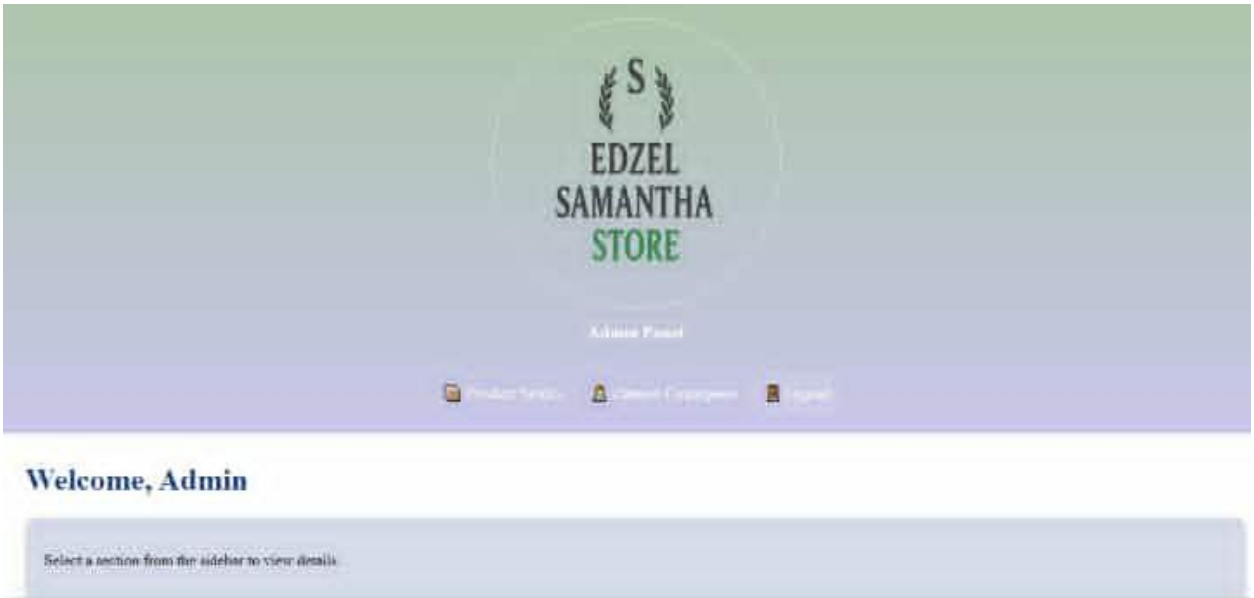
User Management Module

Allows the admin to manage employee accounts and access privileges.

CHAPTER 4 – SYSTEM IMPLEMENTATION AND TESTING

4.1 System Interface





4.2 Description of Each Module

1. **Login/Authentication Module**

   Allows Admin and Cashier to log in securely using their credentials.

   Directs users to their respective dashboards after verification.

2. **User Management Module**

   Enables the Admin to add, edit, or remove users and assign roles.

   Controls access permissions to other system modules.

.4.3 Testing Procedures

1. **Unit Testing**

   Each module (Login, Sales, Inventory, Reports) was tested individually to verify that all basic functions, such as login validation and sales computation, worked correctly.

2. **Integration Testing**

   Modules were tested together to confirm smooth data flow between them. For example, sales transactions were checked to ensure inventory and reports updated automatically.

3. **System Testing**

   The entire system was tested using real operational scenarios to ensure all processes worked together properly for both Admin and Cashier roles.

4. **User Acceptance Testing (UAT)**

   Actual users tested the system to evaluate its usability and performance. Feedback lead to minor improvements in the interface and workflow.

5. **Error Handling Testing**

   Invalid inputs and connection issues were simulated to ensure the system displayed proper error messages and handled problems effectively.

4.4 Test Results and Discussion

Test Results:

The **Login Module** correctly validated user credentials and restricted unauthorized access.

Issues Encountered:

Minor issues such as slow report loading, small rounding errors in totals, and layout misalignment were found.

These were fixed through system optimization, formula corrections, and interface adjustments.

CHAPTER 5 – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary of Findings

Summary of Findings and Overall Results

Functionality

All modules—Login, Inventory, Sales/POS, Purchase, Reports, and User Management—worked correctly, with accurate data flow between them.

Usability

The system was user-friendly and for both Admins and Cashiers, allowing efficient task performance.

Performance Stable and fast, handling multiple transactions with real-time inventory and sales updates.

Overall Outcome

The system successfully streamlined store operations, improved accuracy, reduced errors, and met project objectives as a reliable, efficient, and user-friendly platform.

5.2 Conclusion

The system proved to be **user-friendly, reliable, and stable**, allowing admins and cashiers to perform daily tasks such as sales transactions, inventory tracking, and report generation with minimal errors. User evaluations confirmed its effectiveness and satisfaction in usability and performance. Minor recommendations, such as adding search filters and alerts, were noted for future enhancements.

5.3 Recommendations

- Add advanced search and filter options for faster access to products, sales, and reports.
- Implement alerts and notifications for low stock or pending orders.
- Develop a mobile-friendly version or POS app for flexibility.
- Provide customizable report formats for better data analysis.
- Include automated data backup and recovery for security.
- Enhance user interface responsiveness and add help guides.
- Integrate digital payment options for modernized transactions.
- Optimize system performance for faster loading of reports and large datasets.