Pamantasan ng Lungsod ng Pasig
Alkalde Jose St. Kapasigan, Pasig City
College of Computer Studies

TechPrime AI: Intelligent Ordering and Predictive Inventory Management System for Computer and Peripheral Retail

A Capstone Project presented to the

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The Problem and Its Background

1.1 Background of the Study

According to an article in Salesforce, an Order Management System (OMS) is a software solution that enables sellers to track sales, process orders, manage inventory, and streamline the fulfillment process. In modern times, most ordering systems are now integrated with an Inventory Management System (IMS) to ensure real-time stock tracking and updated product availability, allowing businesses to respond efficiently to customer demand.

Supporting this perspective, research by Rani T. P. et al. (2024) highlights that industries across retail, manufacturing, and healthcare sectors rely on IMS to navigate inventory complexities, promoting cost efficiency and customer

satisfaction through informed decision-making. Together, these insights emphasize the advantages of incorporating OMS and IMS, demonstrating their positive impact on business performance and customer engagement.

Given the rising demand for gadgets and computer peripherals, integrating AI (Artificial Intelligence) and ML (Machine Learning) into an Intelligent Ordering and Predictive Inventory Management System can significantly improve retail operations. For example, AI can help analyze sales patterns to predict necessary product restocking, especially with high-demand items like mechanical keyboards, computer cleaning tools, etc., before they run out. ML algorithms, on the other hand, can give personalized recommendations based on a customer's browsing history or recent purchases — such as suggesting related computer peripherals that they recently searched for.

Ultimately, this integration supports smoother transactions and strengthens competitiveness in the technology retail industry by anticipating inventory demands and tailoring algorithms to the customer's needs, which will help retail businesses, like TechPrime AI, to deliver a more convenient and reliable shopping experience.

1.2 REVIEW OF RELATED LITERATURE

1.2 Significance of the Study

Currently, applications or software systems dedicated to electronic retail businesses are limited, as many of them still rely on general e-commerce platforms. This study is significant as it highlights the advantages of integrating an Inventory & Order Management System tailored for electronic and computer-related retail operations and is beneficial for.various stakeholders.

Computer & Peripherals Retail Companies: This study's results will help electronic retail companies by encouraging better management of their ordering and inventory processes, enhancing business operations by streamlining product ordering, stock monitoring, and sales tracking, ensuring accurate and updated inventory information. Using the findings, retail businesses can implement the software tools discussed to help them keep up with the fast-paced technological landscape and expand their customer base.

Computer Shops, PC Set Owners, Tech Companies: The implementation of the proposed software program from this research will give customers an accessible platform with useful tools — such as recommendations based on previous purchases or searched items — providing them with a hassle-free

service. By providing an accessible online platform, the system simplifies the purchasing process and ensures users can easily find and order the products they need as the system provides a streamlined and efficient way to purchase compatible components or devices, supported by AI-based product recommendations.

Overall, the system proposes a service that promotes customer satisfaction and operational efficiency in the computer and peripheral retail industry using intelligent and predictive technologies.

1.3 Statement of the Problem

In today's world of fast paced technology retail industry, e-businesses that sell computers and peripheral devices face growing challenges in managing the ordering system and inventory operations effectively. Many enterprises are still relying on manual and partially automated systems which leads to inefficiencies in terms of stock monitoring being inaccurate, delayed order processing, and the customer engagement is limited. The lack of intelligent features for prediction and automations, it further hinders business performance.

This study aims to address the said issues through integrating artificial intelligence to optimize order management, to forecast inventory needs, and improve customer interaction. Without such system that has a built-in artificial

intelligence, enterprises struggle to maintain accurate real-time stock levels, foresight demand trends, and provide smooth and satisfying customer experience, eventually limiting their competitiveness in the technology retail market.

General Problem

- Due to the absence of an AI driven ordering and predictive inventory management system, it leads to inefficient order processing, limited decision-making capabilities for computer and peripheral retail businesses, and inaccurate stock management.

Specific Problems

- Inaccurate and delayed update inventory updates leads to stockouts, overselling of and poor handling of high demand products
- The absence of AI-based forecasting makes it difficult to accurately predict demand and limits the ability to make decisions.
- Semi-automated or manually ordering processes resulted in slow transactions, hence reducing customer satisfaction.
- Insufficient real-time contact with customers about order status, shipping updates, and product availability.
- Inadequate tool for getting customers to interact with you, like

automatic handling of inquiries and feedback.

- Difficulty in promoting and managing a wide range of products effectively in a dynamic retail environment.

1.4 Scope and Limitations of the Study

This study focuses on the design and development of TechPrime AI: Intelligent Ordering and Predictive Inventory Management System for businesses engaged in selling computers, laptops, and related peripherals. The project aims to provide an integrated platform that enhances ordering, inventory monitoring, and decision-making through AI-assisted features.

The system will include the following major components:

1. Online Ordering Module

- Digital product catalog with item details
- Order placement and real-time order tracking
- User-friendly interface for customers

2. Inventory Management Module

- Real-time stock level monitoring
- Automatic synchronization of product availability
- Prevention of overstocking and understocking

3. AI Demand Forecasting

- Machine learning–based prediction of product demand
- Analysis of historical sales, seasonal trends, and market patterns

4. Expert System for Restocking

- Automated recommendations for inventory replenishment
- Decision support for maintaining optimal stock levels

5. NLP-Based Customer Support

- Chatbot for addressing basic inquiries, order status, and product questions
- Natural Language Processing integration for improved customer response

6. Marketing Insights

- Automated identification of high-performing and low-performing products
- Support for marketing and product improvement strategies

7. Basic Payment and Shipping Options

- Inclusion of commonly used payment methods
- Support for local and international shipping arrangements

Development Context

- The system will be created using appropriate programming frameworks, databases, and AI models suitable for small to medium retail enterprises.
- Evaluation will be performed in a simulated or prototype environment.

Limitations of the Study

Despite its intended capabilities, the study is limited by the following factors:

1. AI Training Dataset

- Forecasting accuracy depends on limited or simulated historical sales data.
- May not fully capture real-world market fluctuations.

2. Industry-Specific Design

- Tailored for computer and peripheral retail only.
- Effectiveness may vary when applied to other industries.

3. Prototype Implementation

- The system will exist only as a prototype.
- Full deployment, including complete integration with payment gateways and logistics, is beyond the study's scope.

4. Chatbot Constraints

- NLP chatbot may struggle with complex, ambiguous, or multi-lingual queries.
- Accuracy is dependent on the dataset and language model used.

5. Security Coverage

- Only basic security features will be included.
- Advanced data protection measures (e.g., full encryption, GDPR compliance, penetration testing) are not part of this phase.

6. Hardware and Connectivity Requirements

- System performance may vary based on the internet speed and the device capabilities of users and administrators.

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