PAMANTASAN NG LUNGSOD NG MUNTINLUPA

AI-Powered Web-Based Inventory and POS System with AI-Driven Demand Forecasting and Smart Sales Tracking & Analytics for Small Businesses

A Capstone Project Presented to the Faculty of the
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INTRODUCTION

PROJECT CONTEXT

In today's fast-changing business world, small businesses often struggle with managing their products and keeping accurate records of their inventory. Many still rely on manual methods like writing in notebooks or using spreadsheets. These outdated ways can lead to mistakes, lost sales, and wasted time, which makes it harder for business owners to serve customers well and grow their businesses. This project aims to solve these problems by developing an AI-powered web-based inventory and point-of-sale (POS) system specifically designed for small businesses. The system uses advanced AI technology to forecast product demand, track sales, and analyze data. This helps business owners understand which products are selling well, when to restock, and how to manage their inventory more efficiently.

A major benefit of this system is its easy-to-use design. It is built so that even those with little or no computer experience can quickly learn to manage their inventory. Users can smoothly add new items, remove outdated ones, and update stock quantities without any difficulty. The system also generates clear, straightforward reports that provide valuable insights, helping business owners make better decisions about their inventory and sales. Since the system is web-based, it can be accessed from any device such as a smartphone, tablet, or computer whenever there's an internet connection.

This allows business owners to monitor and update their inventory anytime and anywhere, offering great convenience for busy small business owners who need flexibility. The project also provides training and ongoing support to help small business owners and their employees learn how to use the system efficiently. This assistance ensures they can fully utilize the technology and enhance their day-to-day operations with ease. By integrating AI-driven demand forecasting, intelligent sales tracking, and a user-friendly inventory management interface, the system enables small businesses to minimize mistakes, save valuable time, and deliver better customer service. In the long run, it equips them to compete more effectively and achieve sustainable growth in today's digital market.

PURPOSE AND DESCRIPTION

This project is designed to help small business owners by creating an easy-to-use, affordable web-based system for managing inventory and sales. Many small businesses still keep track of their products using paper, notebooks, or basic spreadsheets. These old methods often cause problems like losing track of stock, running out of items, having too much inventory, or making mistakes that can hurt sales and upset customers.

The purpose of this system is to give small business owners a better way to manage their inventory. With this web-based solution, they will be able to see their product list clearly, track how many items they have, and get alerts when items are running low. It will help them keep their business organized and save time by reducing the need for manual work.

The system will be designed especially for small business owners who may not have a lot of experience with technology. It will have a user-friendly layout and simple tools that make it easy for anyone to learn and use. Business owners will be able to add and update product information, check stock levels, and view sales reports all in one place using just computer or a smartphone with internet access. This project also hopes to help small business owners make smarter decisions. By having a clear view of their inventory, they can better plan their purchases, avoid overstocking, and improve how they serve their customers. The goal is to support small businesses in becoming more efficient, more competitive, and more prepared for growth.

Below are the following beneficiaries who will benefited the system:

Small Business Owners, This system helps them manage everything easily and affordably. It saves time, reduces mistakes, and makes running their business less stressful even if they aren't good with computers.

Store Managers and Employees, People who work in the store also benefit because the system makes their jobs easier. They can quickly update stock, process sales, and get reports without complicated work. This helps the store run smoothly and provides better service to customers.

Customers, Customers don't use the system directly, but they benefit too. When stores keep better track of their products, customers are less likely to find items out of stock. The checkout process is faster too, so customers spend less time waiting and have a better shopping experience.

OBJECTIVE OF THE STUDY

General Objective

The main objective of this study is to develop a web-based inventory management system that will help small business owners manage their products more easily, reduce errors, and improve the overall efficiency of their daily operations. The system aims to provide a simple and effective way to track inventory, organize stock, and support daily tasks such as monitoring sales, updating product quantities, and planning restocking. By improving these everyday processes, the system will help business owners save time, avoid common mistakes, and work more efficiently.

Specific Objectives:

1. To design a web-based inventory management system with the following features:
    a. Ability to add, update, and delete product listings.
    b. Real-time stock tracking and low-stock alerts.
    c. Simple dashboard for viewing inventory status and daily transactions.
    d. User-friendly interface that is easy to use.
2. To develop the system using web development tools such as HTML, CSS, JavaScript (React.js for the frontend), Node.js (for the backend), and MySQL for the database.
3. To test the system using Load Testing, Stress Testing, and Functionality Testing to ensure it performs well under real-world conditions.
4. To evaluate the system's quality and performance using ISO/IEC 25010:2011 standards, focusing on functionality, usability, performance efficiency, and reliability.
5. To deploy the system for small business owners as the primary beneficiaries, helping them improve inventory management, reduce errors, and increase efficiency in their daily operations.

SCOPE AND LIMITATION

The scope of this study focuses on the design, development, and evaluation of a web-based inventory management system that aims to help small business owners manage their products and daily operations more effectively. The system will include features such as adding and updating product information, tracking stock levels, receiving alerts for low inventory, and viewing simple reports to support business decisions. It will be built with a straightforward and easy-to-navigate interface to ensure that users can operate the system comfortably without needing advanced computer skills or technical knowledge.

This study is centered only on helping small businesses organize and monitor their inventory. It is meant to provide a basic but helpful solution to common problems such as lost items, overstocking, and running out of products. The system is designed to improve how small business owners handle their supplies on a daily basis, making their work easier, faster, and more accurate. This system is only made to help with managing inventory. It will not include other business tasks like handling money, talking to customers, or guessing future sales. The system works best when users regularly and correctly update their product information. If the data is wrong or missing, the results may not be accurate.

CHAPTER 2

REVIEW OF THE RELATED LITERATURE AND STUDIES

This chapter presents a review of related literature and studies that support the foundation of the research. These materials are important for helping the researcher gain a deeper understanding of the topic.

TECHNICAL BACKGROUND

The development of the Web-Based Inventory Management Solution for small businesses will make use of modern, open-source technologies that are cost-effective, reliable, and widely supported. The system is designed to help small business owners manage their inventory in a more organized, accurate, and efficient way through a simple

and accessible online platform. The front-end of the application is built using web technologies such as HTML, CSS, and JavaScript frameworks like React.js. This creates a user-friendly and responsive interface that can be accessed on both desktop and mobile browsers, allowing business owners and staff to easily track inventory anytime, anywhere.

On the back-end, the application uses Node.js to manage server-side logic and handle communication between the user interface and the database. This ensures fast, reliable processing of tasks such as updating stock levels, managing product data, and generating reports. To store and manage inventory data such as product names, quantities, categories, and transactional histories a MySQL database is used. This provides a reliable and efficient way to organize and retrieve data, even as the business grows.

To make the inventory system smarter, it can include artificial intelligence (AI) features. These features help the system learn from past inventory data and make helpful suggestions. For example, the AI can analyze which products are selling quickly, predict which items will be needed soon, and recommend when to restock or which items are not selling well. These smart features are created using Python tools like TensorFlow, scikit-learn, or PyTorch. The AI runs as a separate service, and the main system connects to it through something called a REST API, which allows different parts of the system to work together smoothly.

This helps small businesses make better decisions and manage their inventory more efficiently. All these technologies work together to give small businesses a powerful tool that saves time, reduces mistakes, and helps them stay organized.

RELATED LITERATURE

The report show that many small and medium businesses still use manual methods to manage their inventory and handle payments, which can be slow, confusing, and lead to mistakes. This paper talks about how newer, automated systems can help solve these problems by making inventory and payment tasks faster and more accurate. It also looks at the current tools being used, what's working well, and what still needs to be improved to help businesses run more smoothly in the future.[1]

According to Chiranjib Sanyal (2005) finds that many small businesses struggle with outdated inventory processes that lack real-time tracking and rely on manual updates from store managers. The study suggests that moving to a web-based inventory system would improve access to current stock data, reduce errors, enable item transfers between stores, and save managers time. As a result, businesses could improve customer service and increase revenue.[2]

Based on a case study at Unizik Plastic Unit, this study finds that a web-based inventory system, combined with an ARMA forecasting model, significantly improves inventory control and data accessibility. It suggests that integrating forecasting and real-time inventory tools helps businesses make better production and stock decisions. [3]

Based on the creation and use of a system called "EzStock," this study shows that a web-based inventory system can help small businesses manage their stock more accurately and save time. It found that most users were happy with the system and found it easy to use. The study suggests that simple and affordable tools like this can make inventory tasks easier and more efficient for small businesses. [4]

Based on a case study of Malaysian small businesses, this study finds that a web-based inventory system using a periodic review model and MySQL database improves efficiency by reducing costs, improving stock accuracy, and simplifying inventory tasks. It suggests that web-based solutions can help small businesses manage inventory more effectively. [5]

The research is about a web-based inventory management system that finds integrating QR code technology significantly improves retrieval speed, operational efficiency, and reduces error rates. It suggests that dynamic QR code generation and user-centric design offer scalable, adaptable solutions to modernize inventory management across various industries.[6]

This study presents a web-based inventory and stock control system that runs on a local encrypted web server to ensure data security and easy access from any device. The system offers real-time stock monitoring, inventory management, and user authentication to help businesses make better decisions and avoid inventory issues. It has a simple online interface for adding, updating, or removing items, which improves accuracy and reduces

errors. The system is flexible and can be customized to fit the needs of different businesses, growing easily as the company expands.[7]

This paper presents a Real-Time Stock Inventory Management System designed to help companies manage their inventory effectively. Using advanced technologies like cloud computing, data analytics, and Internet of Things (IoT) devices, the system tracks and monitors inventory in real time. Its cloud-based setup makes it easy to access, scalable, and flexible, providing accurate updates on inventory levels, locations, and status to help businesses stay competitive.[8]

Based on an analysis of manual inventory methods, this study finds that using spreadsheets is slow, expensive, and often leads to mistakes. It suggests using a simple computer system to help track stock, employee pay, and sales. This system is easy to use and can change as needed. Using it can make inventory work faster, more accurate, and less stressful.[9]

This paper looks at the problems small businesses face when trying to use data analytics. Many don’t have enough money, technical skills, or the right tools. Expensive software, old systems, and staff who don’t want to change make it harder. But if these businesses can get affordable tools and training, they can use data to make better decisions and grow. The paper shows why small businesses need simple, flexible analytics solutions to succeed.[10]

RELATED STUDIES

This study explores the significant challenges and innovative solutions fueling the digital transformation of inventory and sales management in the retail sale of hardware, paints, and glass in specialized stores industry class. By addressing the unique needs of this industry, this research lays the groundwork for innovative solutions to enhance the growth and competitiveness of micro-small construction supply stores in the Philippines. It employs a mixed-methods approach, combining both qualitative and quantitative data for a comprehensive examination of these issues.[11]

In today's dynamic business landscape, the need for intelligent data-driven insights has become significant. This study aims to revolutionize traditional business intelligence by leveraging advanced algorithms. By doing so, it seeks to redefine data understanding and foster strategic growth for small businesses. Through the proposed innovative approach, this study aims to empower small businesses with actionable insights, efficient administrative management, location-specific analytics, and detailed product and transaction tracking capabilities. By leveraging the power of Next.js, Prisma, and Zod, the BI dashboard paves way for intelligent business growth and strategic decision-making. [12]

The general purpose was to develop an efficient Inventory Management System (IMS) that improves service delivery at Smart shoppers' Masaka. The main objectives were to collect and analyze user requirements that provide the researchers with enough information of what the system users want the system to accomplish, to design an

Automated Inventory Management System, to implement a prototype and to test and validate the designed prototype.[13]

Automated inventory management systems integrated with Internet of Things (IoT) technology represent a transformative approach for Small and Medium-sized Enterprises (SMEs) in optimizing their stock levels and reducing carrying costs. A literature review also shows that there is progress in developing automated solutions, such as IoT sensors, real- time data analytics, and cloud-based applications that improve inventory control. A study shows that the adoption of IoT in automation has seen improvement in the accuracy of inventory, a reduction in stockouts, and carrying costs among SMEs.[14]

Due to the expected changes in the business industry, businesses are placing greater emphasis on innovation. Most businesses are taking advantage of technology to achieve innovation. As such, a number of business tools have been developed to help business owners manage their businesses. However, these tools are not utilised by several well-educated small business owners because they claim to prefer their current methods. This is because they believe that paper or a simple Excel sheet is less complicated than an application that will stand as a challenge for them and disconnect them from their business. [15]

Micro, Small and Medium-sized Enterprises plays a vital role in a country's economy. However, in the Philippines, they only contribute 25% of the country's total gross value added. This is because of the challenges faced by the entrepreneurs, one of which is poor inventory management. This paper focuses on the current inventory process of Family Milk Tea, a family owned, beverage business in the Philippines. Current process shows loss of sales due to stockout and additional charges due to overstocking. Aside from this, tracking of sales is done manually through writing or typing in a work sheet using Microsoft Excel. [16]

For companies looking to stay competitive in the dynamic and fast-paced business world of today, effective stock inventory management has become critical. In order to provide organizations with an all-inclusive and flexible inventory control solution, this paper presents a Real-Time Stock Inventory Management System. The system provides real-time stock inventory tracking, monitoring, and management by utilizing cutting-edge technologies including cloud computing, data analytics, and the Internet of Things. Through the utilization of Internet of Things devices, the Real-Time Stock Inventory Management System's cloud-based infrastructure enhances scalability, accessibility, and flexibility while providing accurate real-time tracking of inventory quantities, locations, and statuses.[17]

Although there are many commercial packages to cater for the needs of any small businesses, those packages are generally very expensive, and incorporate many additional features that are rarely used. In most cases the extensive variety of additional features

overcomplicate the system, making it difficult and confusing to use, and often lead to system instability. In this paper we discuss the approach that was used to apply IT technology to tailor make a software package to cater specifically for the needs of an individual business, using very feasible, cheap alternatives to the existing highly specialized and expensive veterinary management systems. The main focus of this paper is to discuss the techniques and design methodologies that were employed throughout the development of the system, and the system architecture used to provide the user interface to the database.[18]

Successful implementation of an inventory optimization solution requires significant effort and can pose certain risks to companies implementing such solutions. Depending on the complexity of the requirements, the solution may also involve a substantial IT investment. In this paper, we present a cost-effective solution for inventory optimization that can be useful for small and medium-sized businesses with limited IT budgets. The solution eliminates the need to purchase additional software and has a framework in which sales data in an Enterprise Resource Planning (ERP) system are accessed, demand statistics based on this data are generated along with other key parameters, and optimal inventory policies, such as those involving safety stocks and lot sizes, are calculated and reported.[19]

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The presented OptInv software system provides support for inventory and sales optimization. Generally, small and medium enterprises cannot afford expensive Enterprise Resource Planning (ERP) systems, with effective supply management modules. Supplies are often managed based only on former experience. Inconvenient situations can occur when an order cannot be accomplished because the needed product is missing, or when the money invested in some products becomes a waste. Using the right methods and tools, these problems can be eliminated. The aim of the OptInv project is to provide a Software as a Service (SaaS) solution for this kind of problems. ptInv imports data from accounting software systems and provides statistics about products, providers and sales. Products can be categorized, the value of the stock can be estimated, the consumption can be predicted and in this way the inventory can be optimized.[20]

DEFINITION OF TERMS

OPERATIONAL TERMS

Small business - A business with a limited number of employees and revenue, typically privately owned, and operating on a local or regional scale.

Inventory Management - The process of ordering, storing, tracking, and controlling stock levels. It includes recording stock quantities, updating product information, monitoring sales, and generating inventory reports.

POS (Point of Sale) - A system used by businesses to complete sales transactions, typically involving a combination of software and hardware such as barcode scanners, cash registers, and receipt printers.

Web-Based System - A system accessible via a web browser over the internet, allowing users to manage operations without installing software locally.

AI-Powered Forecasting - The use of AI algorithms to analyze historical sales and inventory data to predict future product demand more accurately.

Smart Sales Tracking - An intelligent system that monitors, records, and analyzes sales activities in real-time, providing insights to help improve business performance.

Analytics Dashboard - A visual interface that displays data insights (such as graphs, charts, and KPIs) to help business owners make informed decisions.

Stock Alerts - Automated notifications sent to users when inventory levels fall below a certain threshold, helping avoid stockouts.

TECHNICAL TERMS

HTML- The basic code used to build web pages. It puts things like text, images, and buttons on the screen.

CSS- This is what makes a web page look nice. It controls colors, fonts, spacing, and layout.

JavaScript- A coding language that adds interactive features to websites, like clicking buttons, showing menus, or updating information without reloading the page.

RESTful API- A way for different parts of a system (like the front end and back end) to talk to each other and share data over the internet.

MySQL- A program that stores and organizes data, like product names, stock levels, and sales history, so it can be easily found and updated.

Authentication- A security process that checks who you are before letting you into the system, usually by asking for a username and password.

CHAPTER 3

METHODOLOGY

This chapter outlines the various methodologies employed throughout the course of the study. It also includes a diagram to visually represent key components. The sections covered in this chapter include: Requirements Analysis, Requirements Documentation, Software Design, System Product and/or Process, Development and Testing, and the Implementation Plan.

REQUIREMENTS ANALYSIS

The AI-Powered Web-Based Inventory and POS System with Smart Sales Tracking and Demand Forecasting is designed to help small businesses manage their products and sales more easily and efficiently. It allows business owners and staff to create accounts where they can track important business information such as inventory levels, sales transactions, customer data, and supplier records. Users can enter this information manually or connect it with tools like barcode scanners and POS machines for automatic updates. A feature of the system is its AI-powered demand forecasting, which analyzes past sales and trends to predict future product needs helping businesses avoid overstocking or running out of items. It also includes smart analytics that provide real-time insights into sales performance, product popularity, and customer behavior, making it easier for business owners to make informed decisions. The system aims to simplify operations, reduce errors, and boost profitability through smart and accessible technology.

Once small business owners start using the system to manage their inventory and sales, the built-in AI begins to work by looking at patterns, spotting issues, and giving helpful suggestions. For example, if a certain product keeps running out of stock, the system can suggest when and how much to reorder. If sales suddenly drop for an item, it can alert the owner and give possible reasons, like low demand or pricing problems. These smart suggestions help owners make better choices and avoid mistakes.

The system also gives personalized, AI-based tips that get smarter over time. These can include how much stock to order, which items to promote, which prices to adjust, and how to clear out slow-moving products. It sends alerts for low inventory, fast-selling items, or when there's too much stock. A simple dashboard shows this information through easy-to-read graphs, charts, and summaries, so business owners can quickly understand how their business is doing. To keep everything safe, the system uses secure logins and protects all data. Owners don't have to worry about their sales or product information being exposed. Since it's a web-based system, it works well on any device computer, tablet, or phone so users can check their business anytime, anywhere.

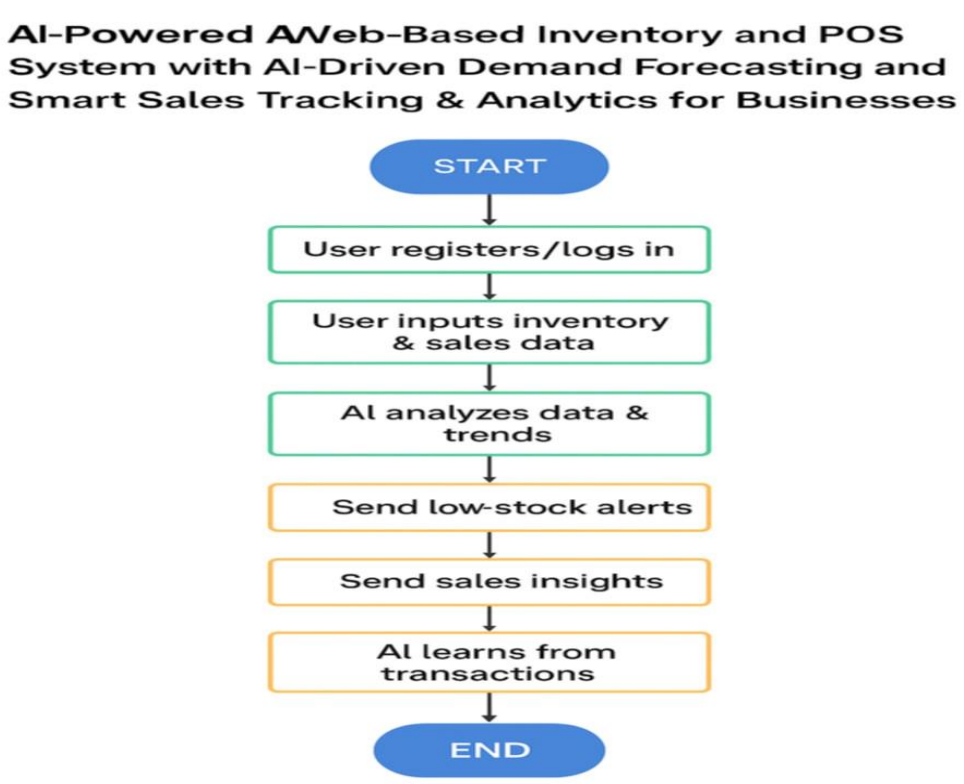

Figure 1. AI-Powered Inventory and POS System – System Procedure

The procedure begins when the system is started and goods are delivered by suppliers. Once the products arrive, they go through inspection and sorting to check their quality and prepare them for sale. These items are added to the system and displayed either in the physical store or online. Customers then enter the store or log in to the platform to browse and select the products they want to purchase. For items that require it, the system calculates the price based on weight. After making their selections, customers proceed to the payment stage where the POS system processes their transaction. Once payment is complete, the items are packaged and handed over to the

customer. The customer then exits the store or platform, and the system updates the inventory and sales records. Throughout the process, the AI analyzes data to track sales, manage stock levels, and forecast future product demand, helping the business make better decisions and run more smoothly.

REQUIREMENT DOCUMENTATION

The requirement documentation for "An AI-Powered Web-Based Inventory and POS System with AI-Driven Demand Forecasting and Smart Sales Tracking & Analytics for Small Businesses" outlines the core features, functionalities, and system expectations aimed at enhancing business operations through intelligent automation. This web-based platform allows business owners and staff to register, log in, and manage essential operations such as inventory control, sales tracking, and customer transactions. Users can input product and sales data, which the system analyzes using AI to identify trends, forecast product demand, and provide actionable business insights.

The system is divided into five main functional modules, each responsible for a specific set of operations:

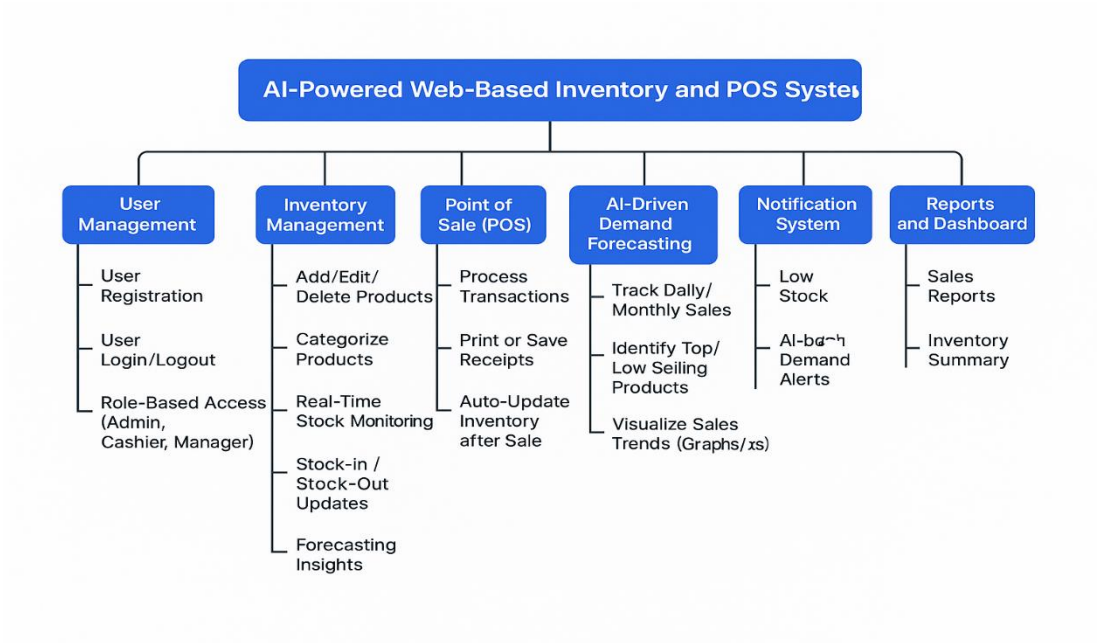

Figure 2. Functional Decomposition Diagram

- **User Management Module**

  This part of the system handles everything related to user accounts. Users sign up, log in, and log out securely. Depending on the user's role (like admin, cashier, or inventory manager), the system gives access to different features. This helps protect the system and make sure each person only sees what they need to use.

- **Inventory Management Module**

This module is where users manage all the products in the store. They can add new products, update information, delete items, and group products into categories. It also keeps track of stock levels in real time so users always know how much of each item is available. When items are added or sold, the inventory updates automatically.

- **Point of Sale (POS) Module**

The system used when selling to customers. It helps users select products, total the price, and complete the sale. After a sale is made, it also updates the inventory right away and saves a record of the transaction. It makes the checkout process fast and organized.

- **AI-Driven Demand Forecasting Module**

It analyzes historical sales and inventory data using machine learning algorithms to predict future product demand. By identifying purchasing patterns and seasonal trends, it provides recommendations on which items to reorder and when. This helps prevent stock shortages and over-purchasing, allowing the business to operate more efficiently and plan ahead.

- **Smart Sales Tracking & Analytics Module**

This part of the system keeps track of all the sales and shows useful information, like which products are selling the most or which ones are not selling at all. It also shows sales totals by day or month and presents everything through simple graphs and charts so business owners can easily understand how their store is doing.

- **Notification Module**

This module sends alerts to users so they know when something important happens. For example, it sends messages when stock is running low or when the system thinks it's time to reorder a product. These alerts help the user take action without needing to check the system all the time.

- **Reports and Dashboard Module**

This part shows a summary of the business in one place. It includes visual reports, like charts and graphs, showing sales performance, inventory levels, and AI suggestions. Business owners can quickly see how things are going and make better decisions with the help of these visual tools.

DESIGN OF SOFTWARE, SYSTEMS, PRODUCT AND/OR PROCESS

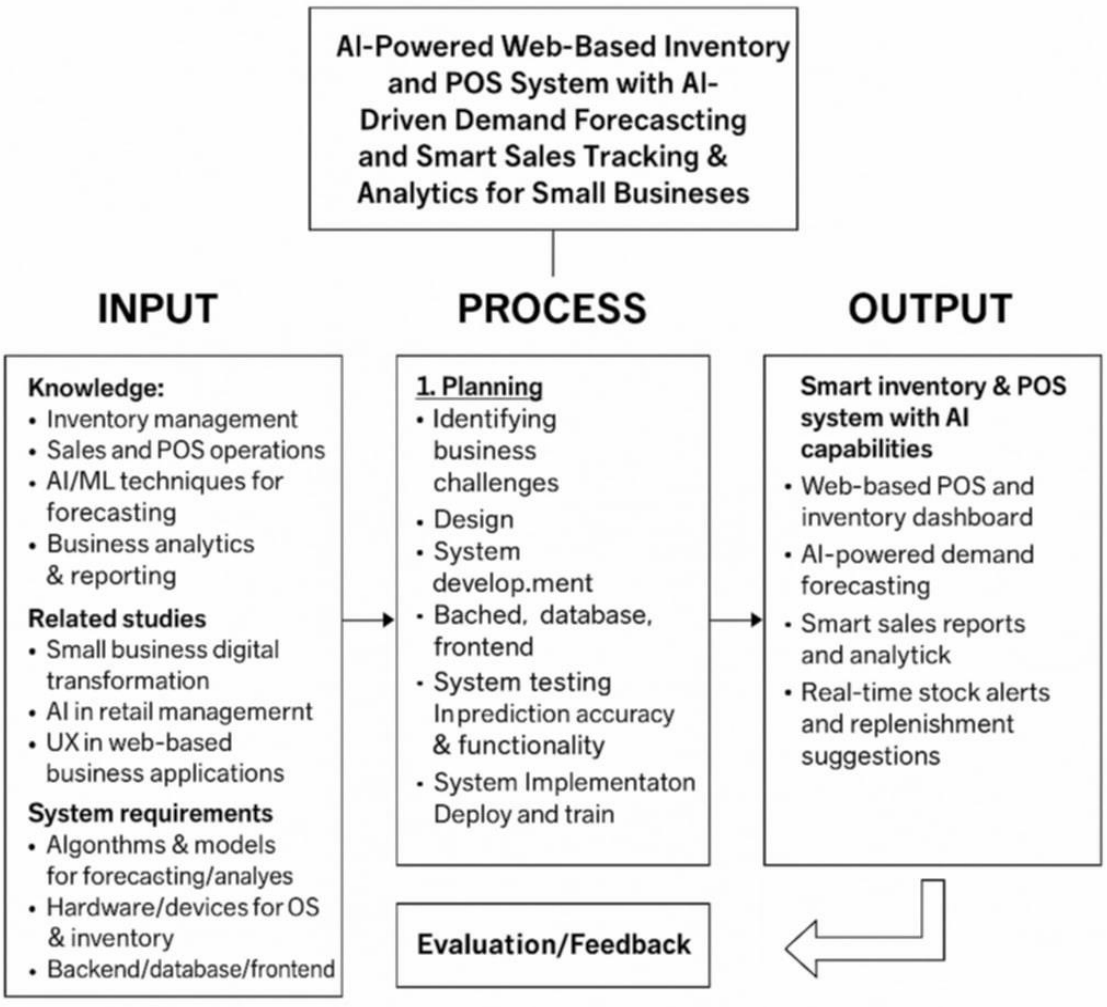

Figure 3. Conceptual Framework

The conceptual framework of this system is made up of four parts:

Input, Process, Output, and Evaluation/Feedback.

The input is everything needed to create the system. This includes knowledge about how inventory and sales work, how AI can help with forecasting, and how businesses use reports. It also includes tools like computers, barcode scanners, and software to build the system and run the AI features. The process is the step-by-step work to build the system.

First, planning is done to understand what the business needs. Next, the system is designed with parts like inventory tracking, sales processing, and AI forecasting. Then, the system is developed by writing code, creating screens for users, and setting up a database. After that, everything is tested to make sure it works properly.

The output is a fully functioning web-based inventory and POS system that uses AI to provide demand forecasting and smart sales analytics. The system generates real-time dashboards, sales reports, and alerts for low stock, helping business owners make informed, data-driven decisions.

The evaluation and feedback stage allows the system to improve over time. User input and usage data help refine features, enhance the AI's accuracy, and guide future updates for better performance and user satisfaction.

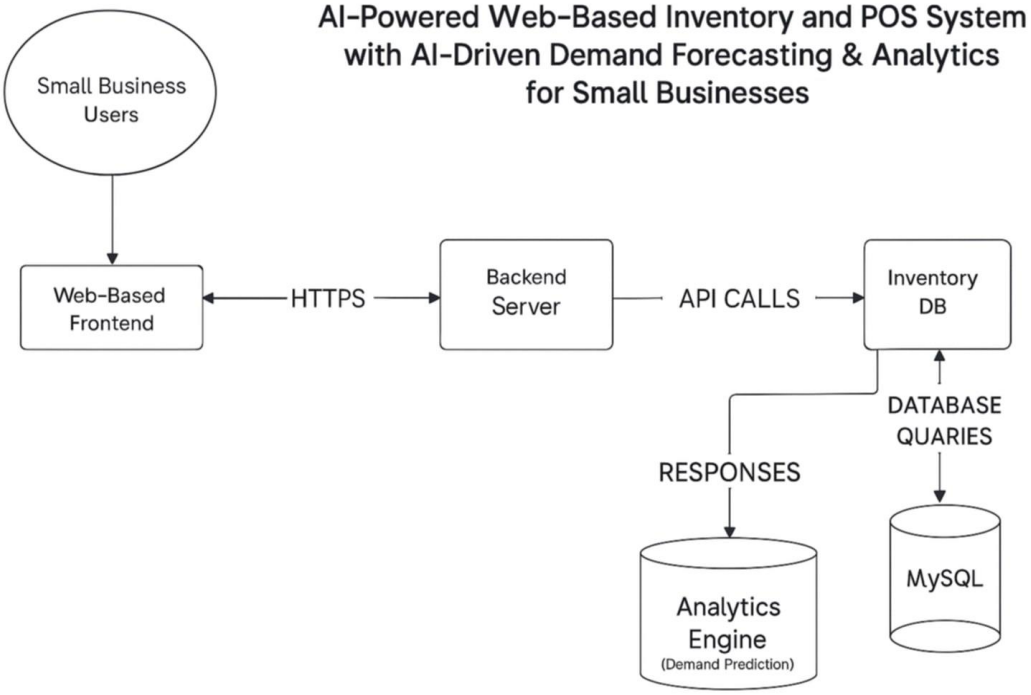

***Figure* 4.** System Architecture

The system architecture of the AI Powered Web Based Inventory and POS System is designed with several connected parts that work together to help small businesses manage sales and inventory more easily. The front-end, which is the part users see on their screens, is built using HTML, CSS, and JavaScript. This lets business owners, cashiers, and managers perform tasks like recording sales, checking stock, and viewing reports. Behind the scenes, the backend server developed using PHP or similar technologies handles user logins, processes requests, and manages how data moves through the system. A MySQL database stores important information such as product details, sales transactions, and stock levels. There's also an analytics engine that reads this data and turns it into easy-to-understand reports and sales summaries.

On top of that, an AI forecasting module looks at sales trends and helps predict future demand, so businesses know what to stock up on. All communication between the parts is protected using secure HTTPS connections, and optional tools like payment systems can be added for more features.

DEVELOPMENT AND TESTING

Development Procedure

The iterative method is flexible, which makes it easier to adjust the project based on new ideas or feedback. This is especially helpful during the development and when the system is being used and tested.

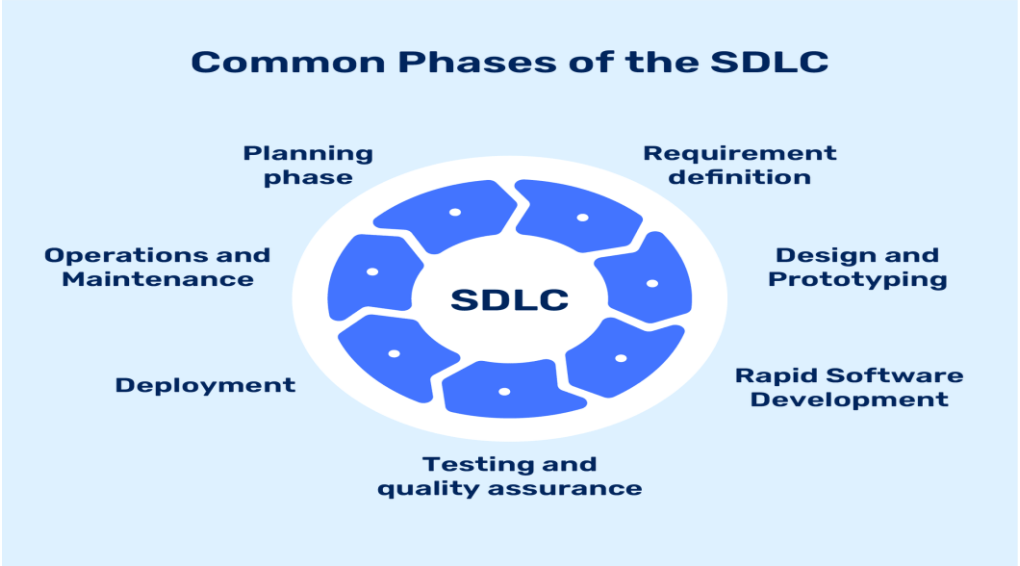

Figure 5. Project Development Process

- **Planning Phase**

This is where the team decided what the system would do, who would use it, and what features were needed. The goal was to help small businesses track sales, manage inventory, and use AI to predict what products would be in demand.

- **Requirement Definition**

In this step, the team gathered all the details needed to build the system. They listed all the important features like a POS screen for selling, inventory tracking, user roles, and AI forecasting.

- **Design and Prototyping**

Here, the team planned how the system would look and how it would work. They made sample designs and database layouts to organize the information and guide development.

- **Rapid Software Development**

The system was built during this stage. Developers created the pages users interact with, connected the database, and added the AI tools to help forecast product demand.

- **Testing and Quality Assurance**

The system was tested to find and fix any problems. This made sure everything worked properly before real users started using it.

- **Deployment**

  After testing, the system was launched online. Small businesses could now use it on a web browser to manage their daily sales and inventory.

- **Operations and Maintenance**

  Even after the system was live, the team kept checking and improving it. Updates were made when needed, and the AI part continued learning from new sales data.

Testing Procedure

This testing procedure ensures that all parts of the AI-powered inventory and POS system work properly and meet user needs. It checks performance, browser compatibility, and includes User Acceptance Testing (UAT). The team follows ISO/IEC 25010:2011 standards to measure quality in terms of speed, reliability, and usability. Each test is planned with clear tasks, testers, tools, and evaluation methods to ensure the system runs smoothly and delivers accurate, user-friendly results for small businesses.

Scale	Range of Mean Value	Interpretation
5	4.51 - 5.00	Excellent
4	3.51 - 4.50	Very Good
3	2.51 - 3.50	Good
2	1.51 - 2.50	Fair
1	1.00 - 1.50	Poor

Table 1. Likert Scale

IMPLEMENTATION PLAN

We developed the system of the AI-Powered Web-Based Inventory and POS System with AI-Driven Demand Forecasting and Smart Sales Tracking & Analytics for Small Businesses through a series of well-defined tasks, each with a clear purpose, assigned personnel, required tools, and a timeline. The process began with Requirement Gathering, where analysts worked closely with small business stakeholders to identify specific user needs and overall system objectives, such as efficient inventory tracking, smart sales analysis, and accurate demand forecasting.

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Task	Description	Responsible Person	Resources Needed	Timeline
Requirement Gathering	Collect the needs and features required for inventory, sales, and Al forecasting functions.	Researcher / Analyst	Survey forms, Interview guides, Internet access	1 Week
Frontend Development	Create the user interface for inventory and sales modules using web technologies.	Frontend Developer	Code editor, Web browser, React/Bootstrap	2 Weeks
Backend Development	Develop the server-side, manage database, APIs, and user login functionality.	Backend Developer	Java, MySQL, Git, Postman	2 Weeks
AI Integration	Add Al for predicting demand and showing smart analytics for sales and inventory.	Al Researcher / Developer	Python, TensorFlow/Scikit-learn, Dataset	2 Weeks
Testing	Perform checking to make sure the system works well across devices and	Testers /Developers	Desktop, Laptop, Smartphone	1 Week

	meets user needs.			
Deployment	Set up the server and apply security so the system can go live for users.	Developer /Researcher	Hosting service, Basic security tools	1 Week

Table 2: Strategy Planning

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