Notre Dame of Dadiangas University

General Santos City

Marist Avenue

" A Web and Mobile-Based Inventory and Replenishment Platform for Suppliers and Retailers"

The Problem and Its Setting

International Context

In the global marketplace, the efficiency of distribution and inventory management systems plays a crucial role in the overall performance of supply chains. As industries expand and the demand for faster, more accurate deliveries rises, traditional methods of inventory tracking and manual stock replenishment are no longer sustainable. According to a report by McKinsey (2022), inefficient inventory systems cost businesses billions of dollars annually due to overstocking, stockouts, and poor demand forecasting. This is particularly concerning for suppliers and retailers whose profits rely heavily on product availability and operational precision.

E-commerce has reshaped the way goods are ordered and delivered. The COVID-19 pandemic further accelerated this shift, forcing many suppliers and small retailers to adopt online platforms and digital tools. However, integration between e-commerce ordering and inventory management is still lacking in many systems, especially for small to medium-sized businesses (SMEs) in developing regions (World Bank, 2021). While large enterprises often have enterprise-level resource planning (ERP) systems, many smaller players cannot afford such solutions and are left using spreadsheets or fragmented tools.

Global trends now emphasize automation, smart replenishment systems, and data-driven analytics to address these gaps. Cloud-based inventory management, predictive restocking, and supplier-retailer platform integration are key strategies that improve transparency and efficiency (Gartner, 2023). To stay competitive and reduce losses, SMEs must embrace platforms that combine inventory tracking, e-commerce ordering, and automatic replenishment into a single user-friendly system.

National Context (Philippines)

In the Philippines, many suppliers and retailers face significant operational challenges due to poor inventory visibility and manual restocking procedures. According to the Department of Trade and Industry (DTI, 2022), about 99.5% of registered businesses in the Philippines are micro, small, and medium enterprises (MSMEs), many of which rely on basic tools like Excel sheets or manual records to manage their inventory and orders.

Such systems are prone to human error and do not scale well as businesses grow. Stock shortages often result in lost sales, while overstocking leads to wasted capital and expired goods especially in industries like food, pharmaceuticals, and retail. Moreover, communication between suppliers and retailers is usually done through messaging apps or phone calls, which makes it difficult to track orders, delivery schedules, and restocking needs (PSA, 2021).

The growing e-commerce sector in the Philippines presents a great opportunity to bridge this gap. With over 85 million internet users and high mobile penetration (DataReportal, 2023), digital platforms can play a transformative role in helping suppliers and retailers manage their

operations more efficiently. However, there remains a lack of tailored platforms that support both e-commerce and inventory synchronization in a single ecosystem for local businesses.

The Philippine government's "Go Digital" campaign and the E-Commerce Roadmap 2022 call for more technological adoption among MSMEs, especially in the areas of supply chain and logistics. Tools that offer affordable, integrated, and easy-to-use inventory and order management features are essential to improve business continuity and competitiveness in the Philippine market.

Local Context (General Santos City)

In General Santos City, known for its strong trade and retail industry, the challenges of inventory and order management are apparent among local suppliers and retailers. Many of these businesses still operate in a semi-digital environment using basic point-of-sale (POS) systems or manual logbooks to track stocks. Coordination between retailers and their suppliers is often reactive rather than proactive, resulting in frequent stockouts or delivery delays.

Retailers often fail to inform suppliers of low-stock items on time, and suppliers likewise struggle with managing multiple retailers' needs simultaneously. Without a shared digital platform, it becomes difficult to monitor demand patterns, anticipate replenishment needs, and optimize delivery schedules. As the local economy recovers from the pandemic and online commerce grows, there is a rising need for tools that enhance digital collaboration across the supply chain.

Given the city's growing population and business activity, a unified system that allows retailers to reorder stocks through an e-commerce platform with real-time inventory visibility and automated replenishment would significantly improve operational efficiency. This can also help local suppliers scale and serve more clients without losing control of their inventory.

Project Scope

This capstone project centers on the design and development of a **web and mobile-based inventory and replenishment platform** designed to streamline supply and ordering processes between suppliers and retailers. The system will serve as both an inventory management tool and an e-commerce portal, providing automated low-stock alerts, order placement, and stock updates in real-time. It primarily targets MSMEs, enabling them to digitize their operations and strengthen supplier-retailer relationships. The inclusion of a mobile app ensures greater accessibility and real-time interaction for on-the-go users such as small business owners, delivery coordinators, and store managers.

System Functionalities

1. **User Registration and Role-Based Login**
    - Retailer and Supplier accounts
    - Admin login for platform control
    - Basic profile and business information setup
    - Mobile app integration for seamless login and user sync
2. **Inventory Management**
    - Manual stock input or CSV import for suppliers
    - Real-time updates on stock levels via web and mobile
    - Low-stock notification system with reorder thresholds
    - Mobile scanning support (QR/Barcode) for quick stock entry
3. **E-Commerce Order System**
    - Product catalog with search/filter by supplier
    - Shopping cart and order confirmation interface
    - Retailers can place restocking orders directly from their dashboards (web and mobile)
4. **Smart Replenishment Alerts**
    - Automatic alerts sent to retailers when stocks are low
    - Suggested order quantities based on historical demand patterns
    - Push notifications on mobile for real-time alerts
5. **Order Tracking and Delivery Scheduling**
    - Suppliers can update order status (processing, shipped, delivered)
    - Estimated delivery timelines displayed to retailers
    - Real-time order tracking and alerts via mobile app
6. **Reports and Analytics**
    - Sales, inventory turnover, and order history reports
    - Dashboard insights for retailers and suppliers
    - Export options for CSV/PDF
    - Mobile dashboard widgets for sales and stock snapshots
7. **Admin Dashboard**
    - User management (approve, block, delete accounts)
    - Platform analytics: active users, total orders, inventory trends
    - Content management (terms, policies, announcements)
    - Mobile-friendly version for on-the-go admin monitoring

Hardware and Software Requirements

Client-Side (Retailers & Suppliers)

- **Hardware:** Smartphone (Android/iOS), Laptop or Desktop (2GB RAM or higher)
- **Software:**
    - Mobile App (Android/iOS built using React Native or Flutter)
    - Modern web browser (Chrome, Firefox)
    - Stable internet connection

Developer-Side / Server

- **Frontend:** React.js (Web), React Native or Flutter (Mobile)
- **Backend:** Node.js (Express) or Django (Python)
- **Database:** MongoDB or PostgreSQL
- **Hosting:** Firebase, Vercel, or AWS
- **Notifications:** OneSignal (push notifications), EmailJS (email alerts)

Project Beneficiaries

1. **Retailers**
    - Improved inventory visibility
    - Easy restocking process and automated alerts
2. **Suppliers**
    - Better stock management and streamlined order processing
3. **MSMEs and Local Businesses**
    - Competitive edge through digital transformation
4. **Local Economy (e.g., Gensan business sector)**
    - Improved supply chain coordination and fewer product shortages

References

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