UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT

Software Design

Progress Report No. 4

Rationale of the System

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I. Objectives

In this section, the goals in this laboratory are:

- To describe the project objective and its entire features
- To enumerate the project's rationale and its relevant to your field of discipline

II. Methods

I. General Objective

The primary objective of this project is to address the critical operational and market deficiencies of the woodworking company by developing a robust, integrated platform:

To **design, develop, and deploy a Website with a Custom Inventory Management System (IMS),** featuring a user-friendly **E-commerce storefront** and a secure administrative back-end capable of **ensuring real-time stock levels**, **streamlining order fulfillment, and accurately handling specialized and dimensional inventory data.**

II. Rationale and Significance of the Study

A. Statement of the Problem

The woodworking company currently faces two critical challenges that severely impact efficiency and growth:

1. **Inadequate Management of Specialized, Diverse Inventory:** The reliance on manual methods (spreadsheets and physical logs) is fundamentally incapable of accurately tracking the company's diverse inventory. This inventory includes both **specific fixed dimensional profiles** (e.g., standard millimeter-based raw stock) and **specialized finished wood products or components** (e.g., specific fram or sash types). The absence of a tailored Inventory Management System (IMS) that can handle these varied attributes — from raw dimensions to specialized item types — leads to frequent **stock discrepancies** and high error rates in both material consumption and finished goods fulfillment.

2. **Outdated and Non-Integrated Digital Presence:** While the company may have an existing online presence, the current website infrastructure is **outdated, non-integrated, and lacks modern E-commerce functionalities** (e.g., real-time stock availability display, secure online payment processing, and streamlined checkout). This limitation restricts the company from maximizing market reach, providing a professional user experience, and seamlessly linking online sales with the back-end inventory status. The need is not merely for a new site, but an **integrated platform upgrade.**

B. Project Justification: The Custom Integrated Solution

The development of this **Website with Custom IMS** is essential because it offers a precise and scalable solution:

- **Precision Inventory Core:** The system's back-end is designed to be **dimension and component-aware.** It utilizes a specialized database structure and calculation module tailored to accurately track stock based on both **physical measurements** and **specialized product attributes**. This ensures that stock is automatically deducted based on the true volume or specific component type sold, providing a level of **accuracy and precision** that off-the-shelf-software cannot offer.

- **Integrated E-commerce Sales Channel:** This custom IMS core is seamlessly linked to the Public Storefront. This integration ensures that every transaction — from browsing to checkout — **reflects real-time, accurate stock availability,** eliminating over-selling and maintaining data integrity across the entire system.

III. Alignment with Project Deliverables (Methods Section)

Deliverable	How the System Will Demonstrate Compliance
Documents	Submission of the complete **System Design Document (SDD), Test Plan,** and both **User and Administrator Manuals.**
Demonstration of Function	Presentation of the complete customer transcation lifecycle and the Admin Panel's ability to **accurately process orders** that include both dimensional stock and specialized components.
Demonstration of Accuracy	Validation that the system performs **accurate inventory reduction** by correctly calculating and deducting complex units sold to the customer, thereby elminiating stock errors.
Demonstration of Reliability, Security or Performance.	Verification of system stability, implementation of secure login protocols, data validation, and fast page loading times, ensuring a professional and reliable user experience.

III. Results

I.1 System Implementation and Operational Workflow

- **Primary Requirement: Flowchart or Diagram** illustrating the **Operational Workflow** of the newly implemented system.
- **Visual 1: A diagram (UML or Flowchart)** detailing the process from the **Customer Order** on the E-commerce storefront to the **Automated Dimensional Stock Deduction** in the Admin-Back End.
- **Caption/Label:** Figure 1. *[Title of System Flowchart/Diagram]*. (Must be center-aligned and in the required font/size).

- **Purpose:** To visually confirm the integration between the E-commerce front-end and the Custom IMS core.

I.2 Demonstration of Accuracy (The Dimensional Data Proof)

- **Primary Requirement: Tables and Data Visualization** proving the system's success rate in handling complex inventory.
- **Visual 2 (Table): A Detailed Table showcasing Test Cases that validate the Accurate Dimensional Stock Deduction.**

  Example: Include columns for Original Stock Dimension, Customer Order Quantity (e.g., in linear meters or complex component type), System Calculated Deduction, and Final Result (Success/Failure).
- **Visual 3 (Chart/Graph):** A Bar or Line Chart comparing the **Error Rate** of the Old System (Excel/Manual) versus the New System (Custom IMS) regarding stock discrepancies.
- **Purpose:** This purpose must prove that the system can handle the **precision** required for dimensional inventory, which the previous Excel system failed to manage.

I.3 System Performance and Reliability

- **Primary Requirement: Screenshots and Metrics** showing speed, security, and real-time capability.
- **Visual 4 (Screenshot):** A clear screenshot of the **Real-Time Administrator Dashboard** (the solution to the monthly reporting issue), highlighting current up-to-the-minute stock levels and sales KPIs.
- **Visual 5 (Table):** A table documenting **Response Time Metrics** (Performance Testing) demonstrating system speed (e.g., Page Load Time, Query Execution Time) to confirm it is not outdated.
- **Purpose:** To demonstrate that the platform is robust, fast, and provides timely data for management decisions.

IV. Conclusion

The conclusion expresses the summary of the whole laboratory report as perceived by the authors of the report.

References

[1] Co Arthur O.. “University of Caloocan City Computer Engineering Department Honor Code,” UCC-CpE Departmental Policies, 2020.