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Warehouse Inventory Management System

Distributed systems project

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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1 Introduction

In today's fast-paced business environment, effective inventory management is of paramount importance. Streamlined inventory control can lead to significant improvements in efficiency, cost savings, and overall operational excellence. With this in mind, I have undertaken the development of a Warehouse Inventory Management System (WIMS) web application, a project designed to optimize the process of tracking and managing items across multiple warehouses and stores.

The primary goal of this project is to create a user-friendly, reliable, and efficient platform that enables warehouse managers and staff to monitor stock levels, manage item movements, and maintain accurate inventory records.

Efficient inventory management is crucial to the success of businesses across various industries, as it helps organizations to balance supply and demand, reduce stockouts and overstocking, and maintain optimal stock levels especially in collaboration with other services integrated into WIMS (not in the scope of current project). Implementing this WIMS will enable companies to save on storage and labor costs, improve cash flow, and respond more quickly to changes in the market. Ultimately, a well-designed and effective WIMS can lead to increased profitability and competitiveness for businesses.

My motivation for developing this Warehouse Inventory Management System stems from my desire to contribute to the company I currently work for, to the improvement of businesses, the global economy, and the lives of people working in supply chain and logistics. By developing a robust and user-friendly WIMS, I believe I can make a meaningful impact on organizations, helping them to thrive and adapt in an ever-changing world.

The successful implementation of this Warehouse Inventory Management System will not only benefit businesses and their employees but also contribute to a more sustainable and efficient global economy. By optimizing inventory management, companies can minimize waste, reduce carbon emissions from excess transportation, and promote more sustainable business practices.

Through this project, I hope to leave a lasting, positive impact on the world and drive forward innovation in inventory management and logistics.

2 Project description

The Warehouse Inventory Management Web App is a comprehensive solution designed to streamline the process of tracking, managing, and organizing items and their quantity within a warehouse and store environments.

This application will allow users to efficiently monitor the current quantity of items and their constituent parts in real-time and manage amount of the items.

The main idea of this app is to provide warehouse owners with more granular control over the available inventories. For better understanding, let's look at a specific example.

In this example, a user withdraws one pizza from the warehouse inventory. Since the pizza consists of various constituent parts, such as dough, sauce, meat, and other ingredients, the system will also update and withdraw the respective quantities of these items.

This granular approach can be maintained not only for the pizzeria purposes, but for a warehouse inventories with any items, the real accounting of which should be carried out at the level of their constituent parts.

More generally, WIMS web app helps to perform usual tasks such as adding, deleting, and updating inventory items.

In addition, the application enables users to track the movement of goods within the warehouse or between warehouses and/or stores.

3 ERD Scheme

3.1 ERD Scheme written description

1. Items (ItemId [PK], ItemName, Description, CategoryId [FK], UnitId [FK], ItemComponentsId [FK], UserId [FK])
2. ItemComponents (ItemComponentsId[PK], ParentItemId [FK], ComponentItemId [FK], ComponentQuantity, UserId [FK])
3. Units (UnitId [PK], UnitName, UnitDescription, UserId [FK])
4. Categories (CategoryId [PK], CategoryName, CategoryDescription, UserId [FK])
5. Warehouses (WarehouseId [PK], WarehouseName, WarehouseAddress, UserId [FK])
6. WarehouseInventory (InventoryId [PK], ItemId [FK], Quantity, LocationId [FK], WarehouseId [FK], LastUpdated, UserId [FK])
7. WarehouseLocations (LocationId [PK], LocationName, LocationDescription, WarehouseId [FK], UserId [FK])
8. Stores (StoreId [PK], StoreName, StoreAddress, UserId [FK])
9. StoreInventory (StoreInventoryId [PK], ItemId [FK], Quantity, StoreId [FK], LastUpdated, UserId [FK])
10. InventoryTransaction (TransactionId [PK], ItemId [FK], Quantity, UserId[FK], StorageId [FK], TransactionType, FromWarehouse [FK], ToWarehouse [FK], FromStore [FK], ToStore [FK], FromLocation [FK], ToLocation [FK], CustomerPickup, Description, Timestamp)

3.2 ERD scheme in Lucidchart

https://lucid.app/lucidchart/33d42f32-9030-4d5f-bdd7-a71b0b99bbf9/edit?invitationId=inv_160a2a99-1db4-400e-86e9-f3df982785c1

4 UI Sketches

https://www.figma.com/file/JHbzCRjsyG73OFh489Jd3M/Warehouse-Inventory-Management-System?node-id=0%3A1&t=mNmWWkzxrQ7wzmCn-1

Not fully ready.

5 References