DOCUMENT SRS SMART INVENTORY MANAGEMENT

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I. INTRODUCTION

The objective of the project selected is to design and implement a Smart Inventory Management system using IoT sensors, mobile app, and website to improve the efficiency and accuracy of inventory management.

Integrating sensors for this project is essential, as they provide comprehensive, real-time data crucial for effective inventory monitory and management.
The primary goal is to optimize inventory management and operations, enabling us to track stock levels, facilitating timely restocking decisions, and optimizing overall inventory management processes.

1. Purpose

This will allow users with a better control over their storage management processes. By providing more precise and reliable data, users will be able to monitor their inventory levels with greater accuracy. This securing that they can maintain an optimal stock level at all times, preventing shortages and as well as overstocking, leading to efficient and effective inventory management. With this, users will be able to rest assured that their inventory will always be controlled, stocked and ready to meet demand in a timely manner.

2. Alcance

This will allow users to have better control when it comes to storage management, this allowing them to have more precise data and letting them always keep their inventory fully stocked in time.

3. Definiciones, acrónimos y abreviaturas

II. GENERAL DESCRIPTION

1. Perspectiva del producto

The inventory system will be primarily designed for the monitoring and efficient management of inventories. It will allow real-time tracking of stored products, ensuring their levels. Through constant monitoring, the system will be able to detect any stock decrease and issue an alert before it runs out.

2. Product Functions

When it comes to software functionality, this will include the following:

- **Physical Layer:** The physical layer consists of the IoT devices, sensors, and RFID tags and RFID readers. The ESP32 microcontroller will serve as the hub for the IoT network, enabling communication

with the weight sensor and RFID readers to gather data on inventory levels and movement.

- **Mobile App:** With the mobile app, this will receive data from the ESP32 microcontroller and display real-time data on inventory levels/weight. Users can view the weight of each inventory pallet, receive alerts when inventory levels fall below custom thresholds and view data visualizations over time.
- **Website:** The website will store historical data on inventory levels, this allowing usera to view trends and patterns over time. The website will also provide user management capabilities, allowing controlled access to inventory data for different users.

3. User characteristics

The users that will be using this website will be employees that are working for a specific company. Taking place a wide range of age.

III. SPECIFIC REQUIREMENTS

1. Functional

Requirement #1	Register
Description	The user will be able to register an account

Requirement #2	Login
Description	The user will be able to login to their account

Requirement #3	Logout
Description	The user will be able to logout from their account

Requirement #4	New palets
Description	Users will be able to add new pallets to the inventory.

Requirement #5	See inventory
Description	Users will be able to see inventory statos in real time.

Requirement #6	Data history
Description	Users will be able to see data history gathered from the sensors.

Requirement #7	Inventory Alerts
Description	Users will receive alerts when the weight reaches a certain threshold

Requirement #8	Intuitive interface
Description	Users will be able to easily

Requirement #9	Update inventory
Description	Users will be able to update existing inventory levels.

Nombre del requisito #10	Set threshold
Descripción	Users will be able to set custom threshold levels for the inventory items.

2. NOT functional

Requirement	Scalability
Description	It must be able to adjust to processing and storage resources according to the needs.

Requirement	Performance
Description	The system must be able to support the increase in connected devices without affecting overall performance.

Requirement	Reliability
Description	
	Implement techniques for data recovery.

Requirement	Security
Description	The system must be protected against any vulnerabilities/failures.

3. Summary

The product to be developed is a smart inventory system, which will feature IoT technologies and sensors, among others, to improve its efficiency. The main use of this system is to automate inventory monitoring with the help of advanced technologies. The basic functionality of the product is to send an alert when the inventory stock reaches its lowest level.

4. Sensors

- **Weight sensor:** To keep track of inventory levels.
- **Modulo HX7611:** This works as a converter for the weight sensor
- **Esp32:** Working as a microcontroller
- **Led / Oled display:** To display the current weight that is put on top of the weight sensor.
- **Temperature sensor:** To prevent fires
- **Humidity Sensor:** This works to maintain control of product quality.

IV. DOCUMENT VALIDATION AND REVIEW

Annex 1

FORMATO DE FIRMAS AUTORIZACIÓN DE PROYECTO

Smart Inventory Management

Tijuana, B.C. a 23 de mayo del 2024

The objective of this project is to design and implement a Smart Inventory Management system using IoT sensors, mobile app, and website to improve the efficiency and accuracy of inventory management. Integrating sensors for the project will provide a comprehensive, real-time data useful for inventory monitoring and management. Our goal is to optimize inventory management enabling us to track stock levels, facilitating timely restocking decisions and overall processes.

Nombre: Dr. Cesar Ortega Parra
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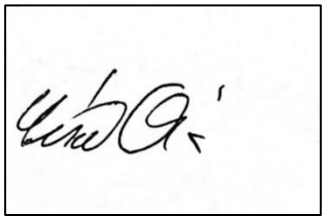

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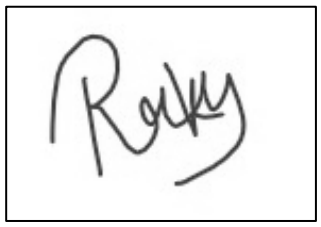

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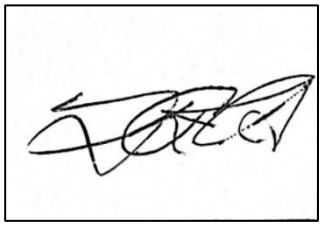

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