



EDUCACIÓN
SECRETARÍA DE EDUCACIÓN PÚBLICA



TECNOLÓGICO NACIONAL DE MÉXICO INSTITUTO TECNOLÓGICO DE TIJUANA

**SUBDIRECCIÓN ACADÉMICA
DEPARTAMENTO DE SISTEMAS Y COMPUTACIÓN**

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CARRERA:

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MATERIA:

Programación Web

TÍTULO ACTIVIDAD:

Modeling and Design

UNIDAD A EVALUAR:

Unidad 3

NOMBRE Y NÚMERO DE CONTROL DE LOS ALUMNOS Y

EQUIPO: Acosta Martinez Moises - 22210278

Hernandez Ramirez Lixbeth Denisse - 22210313

Iñiguez Gallego Carlos Alberto - 19211660

Montesino González Fidel - 20211815

Perez López Saúl - 21212020

Velazquez Morales Lucero - 22210362

NOMBRE DEL MAESTRO (A):

Ray Brunette Parra Galaviz

Software Requirements Specification (SRS) for the Logistics and Distribution System of Medical Products

1. Introduction

1.1 Purpose

In the field of health, the efficient logistics and distribution of medical products is essential to guarantee the timely availability of vital supplies, medicines and medical equipment. The complexity of this process lies in the need to handle sensitive products that require specific storage and transportation conditions, comply with strict regulatory standards, and ensure full traceability to prevent loss or diversion. This project aims to identify and address existing problems in the medical product supply chain, apply requirements engineering methodologies to develop an efficient system and carry out practical tests on the platform to ensure the viability and effectiveness of the proposed solutions.

1.2 Scope

The system will focus on efficient order management, delivery route optimization, and regulatory compliance, addressing existing problems in the medical product supply chain.

1.3 Definitions, Acronyms, and Abbreviations

- SRS: Software Requirements Specification
- RF: Functional Requirements
- RNF: Non-Functional Requirements

2. Overall Description

2.1 Product Perspective

The system will be an integrated platform that allows for order management, route optimization, and tracking of regulatory compliance.

2.2 Project problems

1. Order Management

- Inefficiency in order taking: There may be delays in receiving orders due to manual processes or outdated systems.
- Lack of visibility into order status: If there is no proper tracking system in place, it can be difficult to know the current status of each order, leading to uncertainty.
- Data entry errors: The possibility of human error when entering orders can result in misunderstandings and incorrect shipments.

Specification:

"The current system presents significant inefficiencies in order management, with an average order processing time of more than 24 hours. In addition, there is no platform that allows users to track the status of their orders in real time, which causes frequent complaints and confusion."

2. Delivery Route Optimization

- Inefficient routes: Transporting medical products can face high costs and delays if optimal routes are not used.
- Lack of adaptability to changes: Traffic conditions, weather, or changes in orders can affect delivery, and an inflexible system may not adapt properly.
- Vehicle capacity: Poor planning can lead to inefficient use of transportation resources, including vehicle load capacity.

Specification:

"Currently, delivery routes are planned manually, resulting in a 30% increase in transportation costs and delivery times exceeding 48 hours. In addition, the system cannot adapt to changes in real time, which limits operational efficiency."

3. Regulatory Compliance

- Insufficient knowledge of regulations: There may be a lack of training on the current regulations governing the transportation and storage of medical products.
- Difficulties in following regulations: Without a proper system, it is difficult to keep a record of regulatory compliance, which can result in penalties or fines.

- Lack of regular audits: The absence of audits can expose weaknesses in the system that could be detected in regulatory reviews.

Specification:

"The company faces significant challenges in complying with health and safety regulations, which has led to multiple audits with negative findings. This is due to the lack of a management system that allows for proper training and continuous monitoring of applicable regulations."

4. Other Key Aspects of the Supply Chain

- Lack of coordination between departments: Poor communication between teams can lead to inefficiencies and delays in operation.
- Inadequate supply chain management: Lack of visibility in the supply chain can result in out-of-stock or excess inventory, affecting product availability.
- Safety and traceability issues: The inability to track products throughout the supply chain can lead to safety issues and losses.

Specification:

"A lack of coordination between sales and logistics teams has resulted in inadequate supply chain management, with inventory levels ranging from 20% to 30% above demand, causing unnecessary costs and obsolescence risks."

2.3 Product Functions

- **Order Management:** Receiving, processing, and tracking orders.
- **Route Optimization:** Use of algorithms for route planning.
- **Inventory Management:** Automatic updates and low stock alerts.

2.4 Constraints

- Compliance with health regulations and standards for the transportation of medical products.
- Limited hardware and software capabilities in some facilities.

2.5 Assumptions and Dependencies

It is assumed that users will receive adequate training on using the system and that internet access will be stable.

3. Specific Requirements

3.2.Functional Requirements:

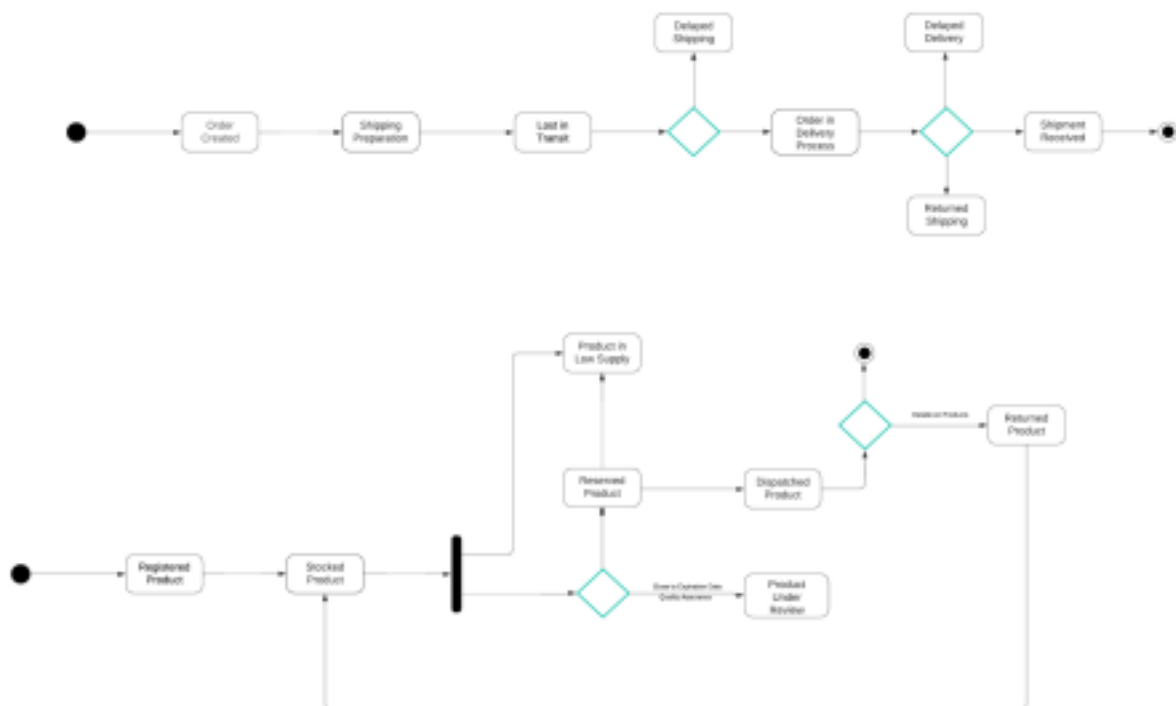
- Order management: receiving, processing and tracking.
- Route optimization: use of algorithms for route planning.
- Inventory management: automatic updating and low stock alerts.

3.2.Non-functional requirements:

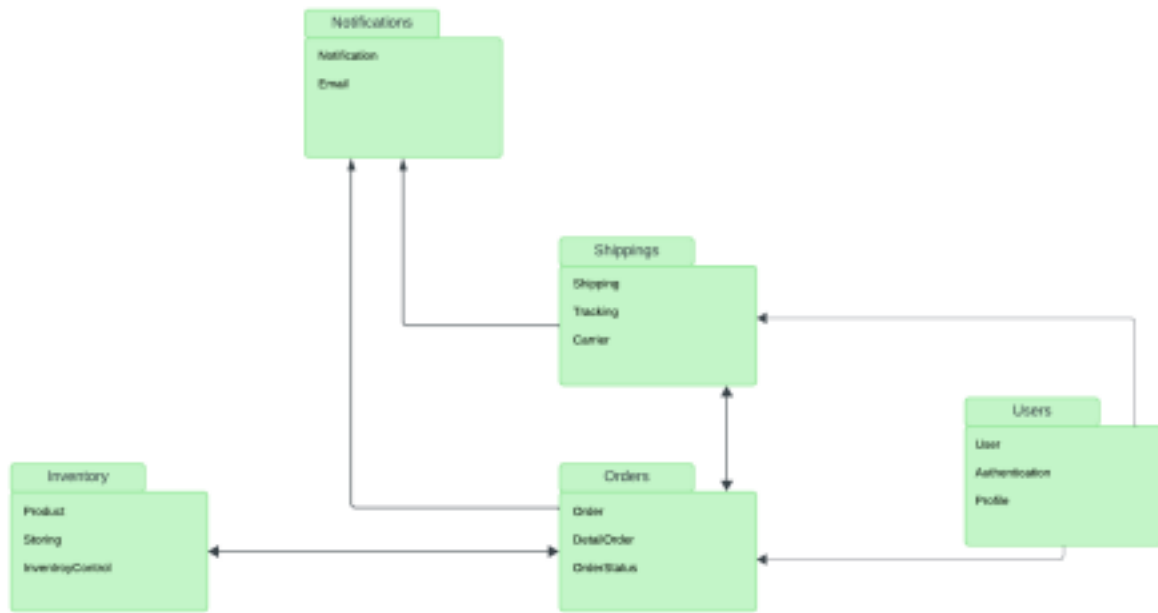
- Usability: friendly interface for non-technical users.
- Performance: Ability to handle multiple orders simultaneously.
- Security: Protection of user and transaction data

4. Annexes

State Diagram



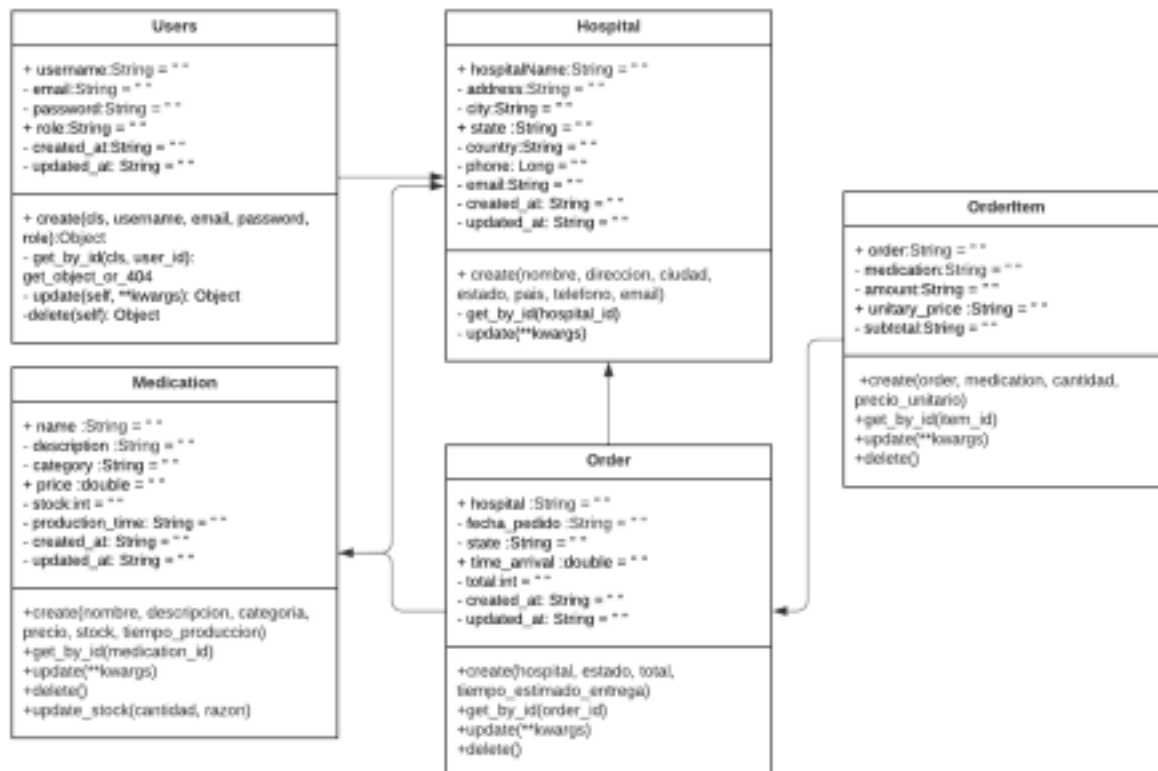
Ticket Diagram



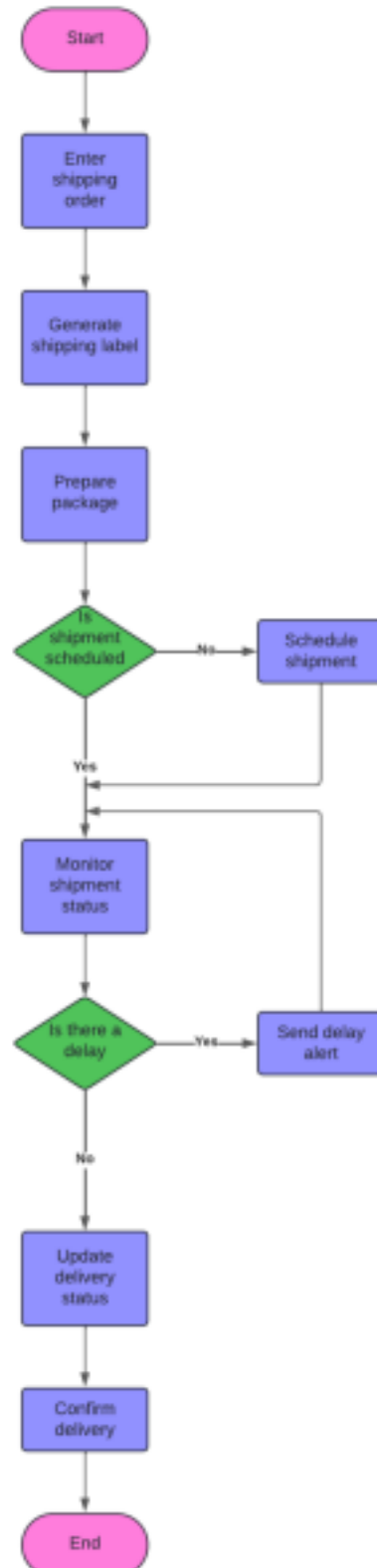
1.Entity-Relationship Diagram



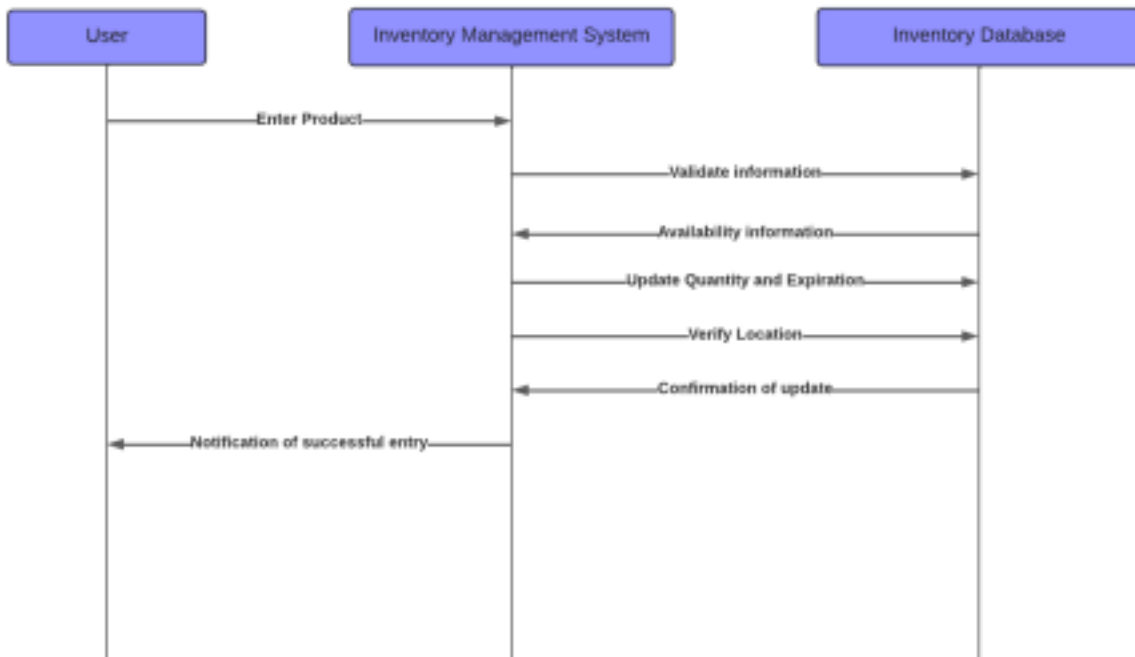
2.Class Diagram



3.Activity Diagram



4. Sequence Diagram



5. Testing on the Platform

5.1 Test Cases

ID	Test Case	Description	Entrance	Action	Expected Result
CP001	Registering Products in Inventory	Verify that the system correctly registers the products received.	List of products received	Register in the system	The inventory is correctly updated with the quantity entered.
CP002	Low stock notification	Test generating alerts when stock is low.	Stock < 10 units	Simulate Stock Consumption	The system sends an automatic notification to the system administrator.
CP003	Shipment tracking	Test real-time tracking of product shipments from the warehouse.	Generated Shipment	Check shipment status	The system correctly displays the current status of the shipment, with location details.

5.2 Test Results

ID	Actual Result	comments
CP001	Approved	The system successfully updated the inventory after registering the products.
CP002	Unsuccessful	The automatic notification was not generated when the stock was less than 10 units.
CP003	In progress	Shipment tracking shows the current status, but information about the exact location is missing.

6. Conclusión

Success in the logistics and distribution of medical products depends on the ability to identify and solve specific problems within the supply chain, apply rigorous requirements engineering methodologies and perform exhaustive tests that ensure the effectiveness of the solutions implemented. This project focuses on addressing key challenges such as efficient inventory management, transportation optimization, regulatory compliance, and product safety. By applying well-structured requirements engineering and conducting hands-on tests on the platform, the aim is to develop a robust system that ensures the timely and safe delivery of medical products, thus contributing to the improvement of healthcare and the well-being of the community.