ISTANBUL TECHNICAL UNIVERSITY

COMPUTER ENGINEERING DEPARTMENT

BLG 411E

SOFTWARE ENGINEERING
REQUIREMENTS SPECIFICATION

PROJECT TITLE : PharmNav

GROUP NAME : Group 16

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1 Introduction

The PharmNav project is driven by the aim of seamlessly connecting patients with nearby pharmacies for prescription needs, providing information about pharmacies' invertories and locations. This document's goal is to serve as a guide, detailing functional and non-functional requirements and exploring diverse user interactions through use cases.

In terms of system requirements, we've outlined both functional and non-functional aspects. We expressed them in natural language form. Functional requirements include the functional features that the application is planned to have, while non-functional considerations include security measures, performance optimization, usability enhancements, scalability planning, regulatory compliance, and reliability in pharmacy information.

The use cases section delves into user types and scenarios. Patients and pharmacy owners are identified as users, each with distinct goals. Scenarios illustrated through personas Sarah, Sofia, John, Jack. Visual representations, including use case diagrams, offer an overview of the system's objectives and functionalities. These diagrams are visual guides, aiding in a better understanding of how PharmNav connects patients with pharmacies. Through detailed use cases like Prescription Medication Search and Updating Medicine Inventory Information, this document also aims to comprehensively convey the PharmNav project's objectives and operational nuances.

2 System Requirements

2.1 Functional Requirements/Tasks

The following table outlines the functional requirements and tasks associated with the PharmNav project, each of which is mapped to the corresponding deliverables. The corresponding deliverables can be seen from the document called 'Project Plan'.

Table of Tasks

Task	Description	Deliverable
1.1	The system shall design wire frames for the main user interface of the mobile application.	1
1.2	The system shall implement the chosen wire frame into the React Native code scripts.	1
2.1	The system shall implement a search algorithm that returns well-stocked appropriate pharmacies as output.	2

2.2	The system shall apply a sorting algorithm to show nearest to furthest pharmacies by the current location of the user.	2
3.1	The system shall create a wire frame for the web admin panel interface based on pharmacy owner requirements.	3
3.2	The system shall apply the selected wire frame of the web admin panel for the pharmacy with ReactJS.	3
4.1	The system shall integrate the prescription to drug database to retrieve proper amounts of prescribed drugs.	4
4.2	The system shall implement a system for real-time updates between the application and the database.	4
5.1	The system shall implement a database connection to store and retrieve pharmacy inventory data.	5
5.2	The system shall develop functionalities for the dashboard to make the pharmacy able to manipulate its inventory.	5
6.1	The system shall analyze data trends to identify patterns in medication demand and usage.	6
6.2	The system shall prepare presentations summarizing the data analysis for drug producers.	6

2.2 Non-functional Issues

In addition to the functional requirements and tasks, the PharmNav project addresses various non-functional issues to ensure the application's effectiveness and user satisfaction. These non-functional aspects include:

2.2.1 Security

- The system shall guarantee the security of sensitive medical and user data by implementing the integration of prescription to drug database without any personal information and identity measures.

- The system shall regularly conduct security audits and vulnerability assessments to identify and address potential risks.

2.2.2 Performance

PharmNav aims to deliver optimal performance to users.

- The system shall employ efficient algorithms for quick pharmacy search and sorting in the mobile application.

- The system shall optimize database queries to minimize response times and ensure real-time data updates.

- The system shall conduct performance testing under various load conditions to identify and resolve bottlenecks.

2.2.3 Usability

Usability is a key focus to enhance the overall user experience.

- The system shall conduct user testing sessions to gather feedback on the mobile application interface and the web admin panel.

- The system shall iteratively refine the design based on user feedback to ensure an intuitive and user-friendly experience.

- The system shall provide clear and concise instructions within the application for both patients and pharmacy owners.

2.2.4 Scalability

- The system shall be designed to scale seamlessly to accommodate growth by employing scalable architecture for both the mobile application and web admin panel.

- The system shall regularly monitor system performance and make adjustments to handle increased user and data loads.

- The system shall plan for future enhancements and features to support the evolving needs of users and stakeholders.

2.2.5 Regulatory Compliance

- The system shall ensure compliance with relevant regulations and standards by adhering to data protection regulations and standards in handling pharmacy data.

- The system shall regularly review and update security and privacy policies to align with industry best practices.

- The system shall collaborate with legal and regulatory experts to stay informed about changes in healthcare regulations.

2.2.6 Reliability

- The system shall ensure compliance with provided pharmacy information and the exact amount of inventories the pharmacies own currently.

- The system shall add a 'Report' option to the mobile app user interface to ensure users can inform the app in inappropriate use cases of pharmacy owners.

3 Use Cases

3.1 User Types

- Patients: A user which is capable of seeking pharmacies for specific prescriptions, which can be achieved by entering a prescription code and examining listed pharmacy results ordered by distances.

- Pharmacy Owners: The user side of the project which has potential of managing inventory and tracking prescription fulfillment, which can be achieved by entering prescription codes and then updating the stock, or after selecting medicines, they can add or delete medicine operations from the stock manually.

3.2 User Scenarios

3.2.1 Scenario 1

- **Persona:** Sarah, a working professional with a busy schedule.

- **Scenario:** Sarah has just visited her doctor and received a prescription for a specific medication. She is new to the area and unsure where the nearest pharmacies are. Using PharmNav, she scans her prescription code. The app quickly identifies her location and shows a list of nearby pharmacies, indicating which ones have her medication in stock. She selects a pharmacy that is on her way home from work. Sarah is able to navigate to the pharmacy, pick up her medication, and make it back in time for her next meeting.

3.2.2 Scenario 2

- **Persona:** Sofia, a student with a busy schedule.

- **Scenario:** Having obtained the prescription code by the doctor, Sofia entered the code into the app's form, yet did not get any pharmacies listed as doctor did not give the correct code by misspelling a letter. Application informed her about the absence of the prescription code so that she went to see the doctor and obtain correct version of code, which avoided her to go a pharmacy without the correct code.

3.2.3 Scenario 3

- **Persona:** John, the owner of a local pharmacy.

- **Scenario:** John starts his day by checking the PharmNav dashboard to review the inventory levels of his pharmacy. He notices that several commonly prescribed medications are running low. After supplying new medicines, he updates the inventory in the PharmNav app to reflect the new updated stock. PharmNav app has become an essential tool in his inventory management, ensuring he can meet his customers' needs efficiently.

3.2.4 Scenario 4

- **Persona:** Jack, the owner of a local pharmacy.

- **Scenario:** Jack saw customer Linda joining in pharmacy and welcomed Linda and she gave him a prescription code obtained by the doctor. Jack gave them to her and typed the code into the computer to update the stock of medicines. He pressed the update button, and the computer showed that the medicines in the stock were updated.
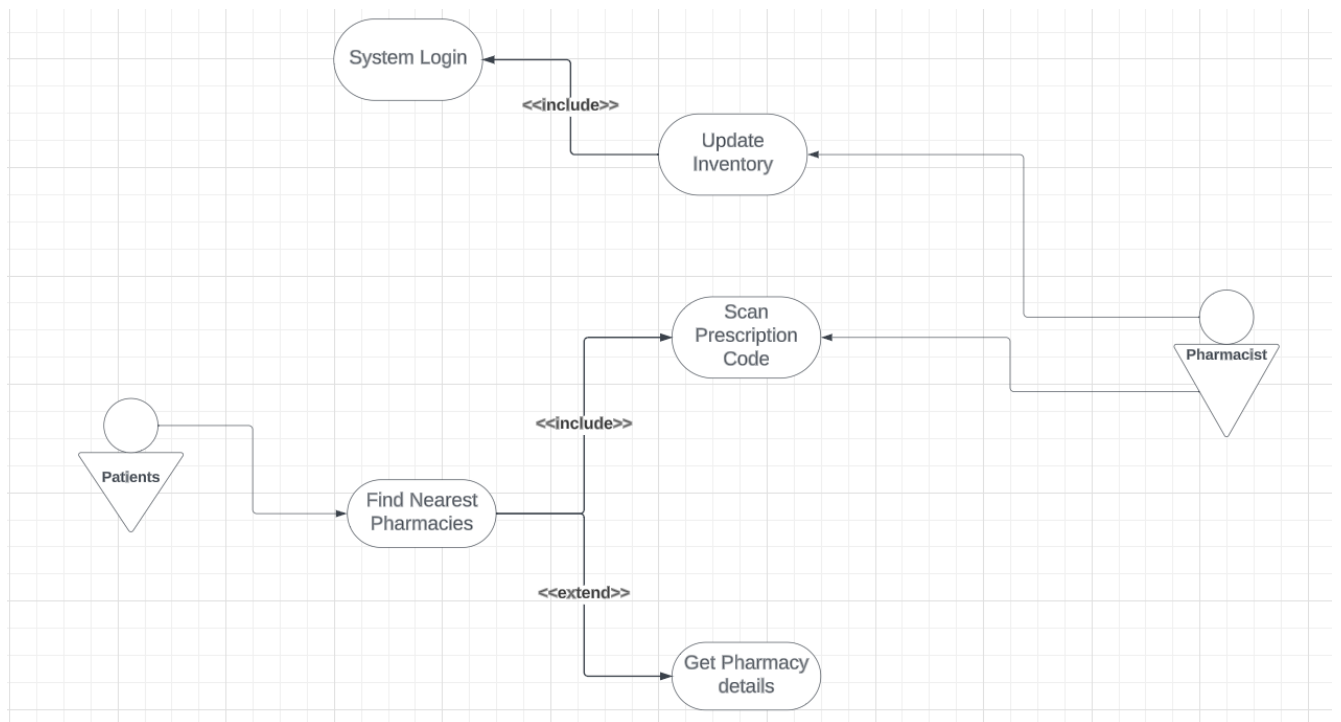
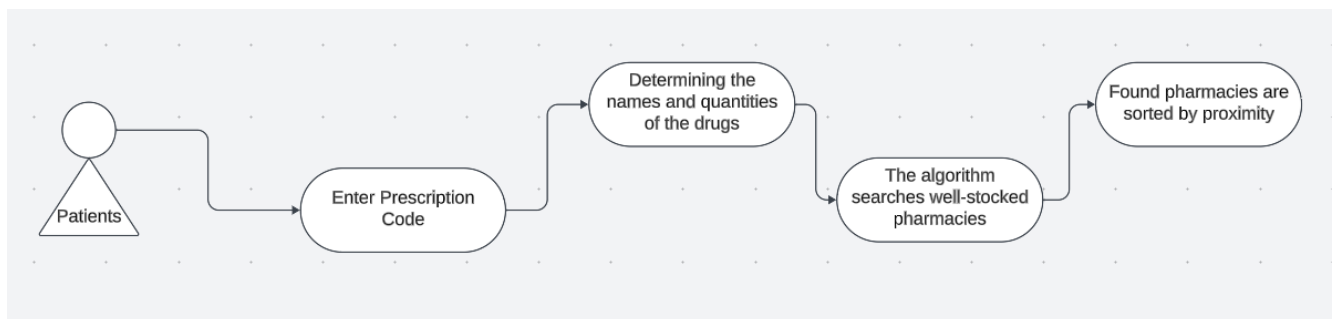## 3.3 Use Case Diagram

Figure 1: Use Case Diagram For Whole System

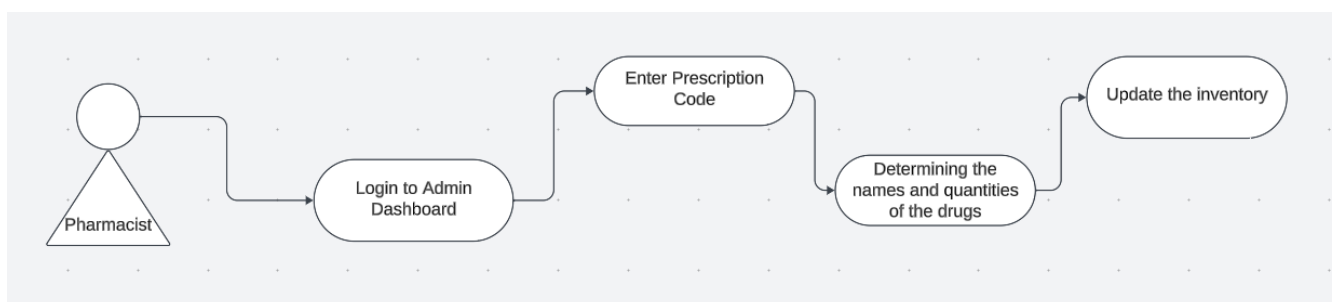Figure 2: Use Case Diagram For Finding Nearest Pharmacies

Figure 3: Use Case Diagram For Updating Inventory

3.4   Use Cases

3.4.1   Use Case 1: Prescription Medication Search

- **Actors:** User (Patient)

- **Preconditions:**

    - PharmNav app is installed and functional on the customer's device.

    - The customer has a valid prescription or prescription code.

    - Pharmacies in the area are registered with PharmNav and have updated their inventory.

- **Main Flow:**

    1. Customer opens PharmNav and enters or scans their prescription code.
    2. The app decodes the prescription and searches for nearby pharmacies with the required medication in stock.
    3. Customer selects a pharmacy based on medication availability, distance, and other preferences.
    4. PharmNav displays the selected pharmacy's location on the map and details, including address and contact information.
    5. Customer decides to visit the pharmacy and uses the app's navigation feature to get directions.

- **Postconditions:**

    - The customer is aware of the nearest pharmacy where their medication is available.

    - The inventory of the selected pharmacy is updated by the pharmacy.

- **Alternative Flows:**

    - **A. Alternative rotations:**

        1. Customer opens PharmNav and enters or scans their prescription code.
        2. The app decodes the prescription and searches for nearby pharmacies with the required medication in stock.
        6. If the user does not want to choose a specific pharmacy for a certain reason, they can also select more distant pharmacies to access detailed information.

3.4.2   Use Case 2: Updating Medicine Inventory Information

- **Actors:** Pharmacy Owner

- **Preconditions:**

  - Pharmacy Owner has an active account on PharmNav.

  - Suitable Browser should be provided by the Pharmacy Owner's device for access to the Admin Dashboard.

- **Main Flow:**

  1. Pharmacy Owner logs into their PharmNav account.

  2. PharmNav displays the pharmacy's dashboard with current inventory levels.

  3. The Owner enters a prescription code that consists of the medicines and presses the update button to update the stock.

  4. PharmNav updates the inventory information in real-time and confirms the update to the Pharmacy Owner.

- **Postconditions:**

  - The medicine inventory information on PharmNav reflects the latest updates made by the Pharmacy Owner.

  - Any changes in inventory status (e.g., restock, low stock) are accurately represented in the app.

- **Alternative Flows:**

  - **A. Manual Inventory Update:**

    1. Pharmacy Owner logs into their PharmNav account.

    2. PharmNav displays the pharmacy's dashboard with current inventory levels.

    5. The Owner enters medicine names and amounts, then presses the update button to update the stock.

    6. PharmNav updates the inventory information in real-time and confirms the update to the Pharmacy Owner.