DHA Suffa University
Department of Computer Science
Final Year Project

Medi-Secure
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Software Requirements Specifications

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Definition of Terms, Acronyms, and Abbreviations

Term	Description
Medicine traceability	A comprehensive solution addressing black market medicine trade
Black Market Medicine Trade	The illegal trade of pharmaceuticals outside authorized channels, often associated with counterfeit or substandard products.
Block chain	A decentralized and secure digital ledger technology that facilitates transparent and tamper-resistant recording of transactions
React	Facebook frontend framework
Node JS and express JS	Backend framework
Chatbot Feature	Revolutionary chatbot empowers pharmacists by assisting financially constrained consumers in finding affordable alternatives with the same formulation
Medicine counterfeiting	unauthorized reproduction or replication of pharmaceutical products

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Introduction

Medi-Secure, an innovative solution addressing the surge in black market medicine trade and counterfeit production by by automating secure transactions through blockchain and providing a user-friendly web application and app interface.

1.1 Purpose of Document

The purpose of this document is to have a better understanding and detail description of Medi-secure application and all the procedures, tech stack used for making the application along with the timeline everything in detail.

1.2 Intended Audience

☐ Supervisor

☐ Co-supervisor

☐ Jury

☐ PMO

☐ Previewer

☐ Project Coordinator

2. Overall System Description

2.1 Project Background:

Medi-Secure is a crucial solution aimed at preventing medicines from being sold illegally on the black market and being counterfeited. The idea came with the rise in the black market for medicines during the COVID-19 pandemic, where essential items were unlawfully sold at higher prices due to scarcity. The project's main goal is to combat these illicit practices by introducing automation through blockchain technology. This approach ensures that transactions in the medicine supply chain are automated, creating a system that is trustworthy and traceable. In essence, Medi-Secure strives to protect public health by disrupting the illegal trade of counterfeit drugs and promoting transparency and accountability.

2.2 Problem Statement

The Problem of	- Surge in black market medicine trade during events like COVID-19, leadingto counterfeit medicines. - Inflation of essential medication pricesdue to illicit activities in the pharmaceutical supply chain. - Lack of transparency in medicine distribution hampers identifying andstopping black market practices. - Limited accessibility to essential treatments for financially constrainedconsumers. - Absence of a secure, automatedsystem for pharmaceutical transactions allows fraudulent activities

Affects	1. Contributes to the increase in criminalactivities, especially in the pharmaceutical black market. 2. Fuels the growth of an undergroundeconomy associated with illegal pharmaceutical activities.
The impact of which is	1. Safeguard public health by ensuringthe veracity and integrity of pharmaceutical products. 2. Deploy cutting-edge Blockchaintechnology to instill trust and transparency in pharmaceutical transactions.
Solution	Medi-Secure tackles the prevalent issue of black market medicine trade by employing blockchain technology to automate and secure transactions throughout the pharmaceutical supply chain. The platform integrates a user-friendly web application and app interface, fostering seamless communication among pharmaceutical stakeholders

2.3 Project Scope

- Our main goal is to revolutionize the pharmaceutical industry by using block chain technology to address black market practices, ensuring transparency, accessibility, and affordability in medicine distribution.

- Establishing a secure and automated transaction system through block chain technology to ensure traceability and security, spanning from the production phase to pharmacists.

- Developing a user-friendly web and app interface for seamless communication among pharmaceutical stakeholders, enhancing transparency and security in the medicine supply chain.

2.4 Not in Scope
- No medical treatment; emphasizes secure transactions, transparency in pharmaceuticals

- Detecting non-pharmaceutical health issues; focus is on pharmaceuticals.
- Providing emergency medical services; the project's primary focus is on pharmaceutical supply chain enhancements

2.5 Project Objectives

- Bridge the gap in trust and transparency within the pharmaceutical supply chain.
- Disrupt black market practices and prevent the circulation of counterfeit medicines.
- Ensure the affordability and accessibility of essential treatments for all consumers.
- Provide a user-friendly web application and app interface for efficient communication among pharmaceutical stakeholders.

2.6 Stakeholder and Affected Group

The stakeholders and affected groups of Medi Secure include:

- Medical companies

- Distributor

- Manufacturer

- Pharmacist

By involving these stakeholders and affected groups, Medi Secure can gather valuable input, feedback, and support throughout the project lifecycle, ensuring the system meets their needs and expectations.

2.7 Operating environment

- Medi Secure thrives in a dynamic operating environment, embracing mobile devices and desktops while integrating essential software frameworks tailored to support our blockchain-based software. Engineered for seamless adaptability, the system is crafted to function effortlessly on smartphones, desktops, and tablets, seamlessly aligning with popular mobile operating systems like Android.

- To fortify trust and security, Medi Secure strategically incorporates blockchain technology. This innovative integration not only enhances the reliability of our software but also establishes a secure and trustworthy supply chain network. By leveraging

blockchain, we ensure a robust foundation, instilling confidence in users regarding the integrity and security of their interactions within the system

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2.8 System Constraints

One of the main constraints is every transaction should be through block chain to improve traceability and accountability.

2.9 Assumptions and Dependencies

The assumptions and dependencies are as follows

☐ Every transaction is performed through block chain

☐ Every data related to medicine is registered on block chain

☐ The values filled in each transaction is real data not just values

3. External Interface Requirements

3.1 Hardware Interfaces

The system seamlessly interacts with the following hardware interfaces:

- **Mobile Devices:**

Medi Secure is meticulously crafted for seamless operation on a wide range of mobile devices, including smartphones and tablets to reduce the cost of desktop cost. The user-centric design ensures an intuitive and responsive interface, leveraging the unique features of each device to provide an immersive and efficient experience. With a focus on mobility, users can access Medi Secure on-the-go, harnessing the power of their smartphones or tablets for quick and convenient access. The mobile version of Medi Secure offers a dynamic and user-friendly platform, adapting effortlessly to the diverse needs of individuals in the modern healthcare landscape.

- **Desktop Devices:**

Medi Secure is also optimized for desktop devices, catering to users who prefer or require a larger screen. Whether it's a desktop computer or a laptop, the system ensures a seamless and user-friendly experience on these devices. This expanded compatibility allows users to access Medi Secure not only on mobile devices but also on their desktops, offering flexibility in terms of device choice and enhancing the overall usability of the system

3.2 Software Interfaces

The following applications serve as software interfaces for Medi-Secure:

1. Blockchain Technology

Medi-Secure relies on blockchain technology as a foundational software interface. This ensures the automation and security of transactions throughout the medicine supply chain, offering trust and traceability. The blockchain records and verifies transactions from production to distribution, enhancing overall transparency and reducing the risk of illicit activities such as the trade of counterfeit medicines.

2. Web Application and App Interface:

The platform features a user-friendly web application and mobile app interface. This intuitive interface facilitates seamless communication among pharmaceutical stakeholders, including pharmaceutical companies, distributors/pharmacists, and end-users/patients. Users can access and interact with the system effortlessly, promoting transparency and security in pharmaceutical transactions.

3.3 Communications Interfaces

The communication interfaces are the communication of application with block chain in order to execute transaction and maintain the database as for stock in and stock out.

4. System Functions / Functional Requirements

4.1 System Functions

Function Category	Meaning
Evident	Should perform, and user should be cognizant that it is performed.
Hidden	Should perform, but not be visible to users. This is true of many underlying technical services, such as save information in a persistent storage mechanism. Hidden functions are often missed during the requirements gathering process.
Frill	Optional; adding it does not significantly affect cost or other functions.

Ref #	Functions	Category	Attribute	Details & Boundary Constraints
R1.1	User Registration	Evident	Username, Email, Password,CNIC,business reg number	Users provide personal information to create accounts & user data must be unique and secure
R1.2	Order Placement	Evident	Users place orders for required medicines	Users place orders for required medicines & order quantity must be within stock limits
R1.3	Inventory Management	Frill	Stock Updates, New Medicine Addition	Pharmaceutical companies update stock levels and add new medicine & System ensures real-time stock accuracy
R1.4	Blockchain Integration	Hidden	Transaction Records, Traceability	Transactions recorded on blockchain for transparency & Blockchain ensures data immutability

System Attributes/ Nonfunctional Requirement:

Attribute	Details and Boundary Constraints	Category
Secure Access	Access to consumer's confidential data	*Mandatory*
24 x 7 Availability	System must be available round the clock	*Mandatory*
Compatibility	Compatibility with various devices and environments	*Mandatory*
Response time	The system would provide search results for medicines availability in few second.	*Mandatory*

4.2 Use Cases

4.2.1 List of Actors
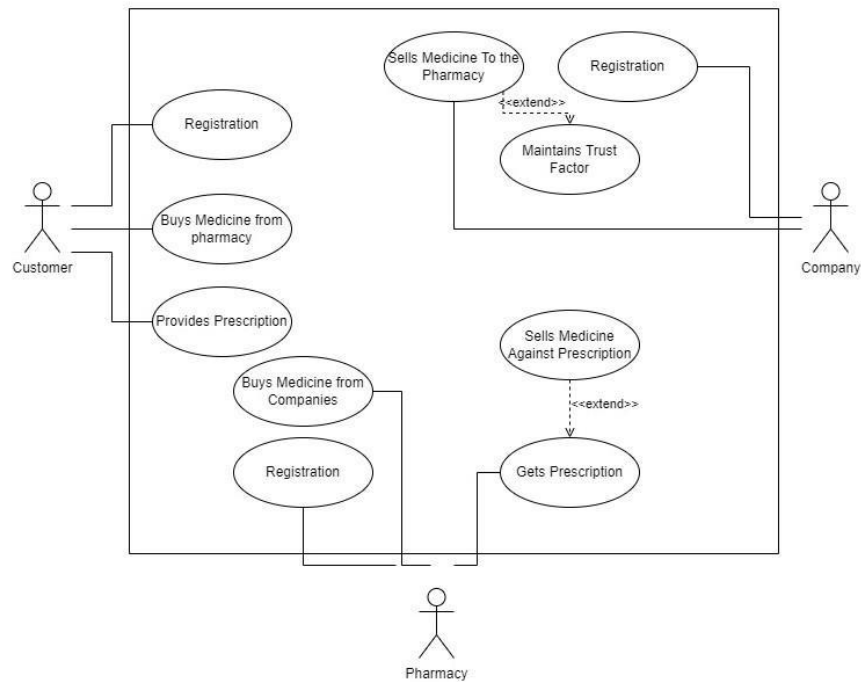- Customer
- Company
- Pharmacy
- Distributor

4.2.2 List of Use Cases
Customer can visit the pharmacy to buy medicines on our platform

- Pharmacist can check availability of medicines on the platform
- Manufacturer can sell medicines to supplier and pharmacist

- Transactions are added on block chain.

- Medi-Secure show the medicine availability.
- Software updates the stock and add transaction to block chain

4.2.3 Use Case Diagram

4.2.4 Description of Use Cases

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Section: Main

Name:	*Medi Secure*
Actors:	*User*
Purpose:	*Empowering Transparency, Trust, and Accessibility in Medicine Distribution through Block chain Technology, Disrupting Black Market Practices*
Description:	*Medi-Secure fights black market medicine trade and counterfeiting with secure blockchain transactions, ensuring transparent and secure pharmaceutical operations through user-friendly interfaces.*

Pre-Conditions	*User must have the Medi-Secure Application installed*
Successful Post-Conditions	*Pharmaceutical sector will get original medicines without the fear of counterfeiting*
Failure Post-Conditions	*None.*

Typical Course of Events		
Actor Action		**System Response**
1	*This use case begins when user, pharmacy and company will register*	*Validates user credentials and creates a new user account in the system.*
2	*Pharmacist: Places an order for medicines through the platform*	*Receives the order request, verifies the availability of the requested medicines, and processes the order*
4	*Company: Receives order requests from pharmacists.*	*Updates the inventory status, processes the orders, and dispatches the requested medicines to the pharmacists.*
5	*Records transactions related to medicine orders, stock updates, and inventory management*	*Stores transactional data securely on the blockchain, providing transparency and traceability for all stakeholders.*
6	*Company: Updates the stock information and adds new medicines to the platform.*	*Updates the platform's database with the latest stock information and makes new medicines available for purchase.*

Alternative Course

Medicine may be out of stock.

5. Non - Functional Requirements

5.1 Performance Requirements:

- Application requires a good specification desktop/mobile to run smoothly.

- Application will be user friendly as our targeted audience are not the technical users.

- Application requires registration from every stakeholder/users.

- Application requires block chain technology to be utilized to secure the transactions.

5.2 Safety Requirements:

- Ensure secure storage and protection of manufacturer/company and pharmacist data, safeguarding personal information against unauthorized access or breaches.
- Our application should not have any bugs.
- Implement a secure verification process for pharmaceutical products to prevent the distribution of counterfeit medicines, ensuring the safety of end-users

5.3 Security Requirements

- User, pharmacy and company first need to register themselves in order to identify themselves.
- Adhere to secure coding practices during the development of the web application and app interface to minimize vulnerabilities and potential exploits
- Maintain secure configurations for all system components, ensuring that unnecessary services and functionalities are disabled to reduce the attack surface

5.4 Reliability Requirements

- Application will be available to users all the time.
- Application will secure and record all the transactions on block chain to prevent counterfeiting

5.5 Usability Requirements

- Every user must register on our application in order to create trust and security.
- Pharmacists must have either a desktop or mobile to run the application.
- Users should have a basic knowledge of purchasing stuff from different online applications.

5.6 Supportability Requirements

- Comprehensive and up-to-date documentation must be provided.
- A dedicated support channel or contact for users will be provided so that issues are reported and resolved efficiently, improving overall user satisfaction
- Regular feedback helps in identifying areas for improvement, understanding user needs, and enhancing overall user satisfaction.

5.7 User Documentation

- As such not any document but will be delivered if needed

6. References

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