A Project Report
On
Medical Store Management System

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Abstract

The Medical Store Management System with Java is a comprehensive software solution designed to enhance the efficiency and effectiveness of pharmaceutical retail operations. This project addresses the challenges associated with traditional manual systems by leveraging Java programming language to create an automated and user-friendly system. The system provides a robust platform for managing diverse aspects of medical store operations, including inventory management, sales transactions, and record-keeping. It's a full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. Medical Store Management System, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on the record keeping. Thus it will help organization in better utilization of resources. The organization can maintain computerized records without redundant entries. That means that one need not be distracted by information that is not relevant, while being able to reach the information. It provides some key features named as Inventory Management where users are enabled to seamlessly add, update, and delete drugs from the inventory also facilitates accurate tracking of stock levels, expiration dates, and supplier details, Company Management that allows for the addition, modification, and deletion of pharmaceutical companies in the system. Users can maintain a comprehensive database of suppliers and their associated drugs, Sales Transactions make Facilitates smooth and secure sales transactions. Users can input sales details, update inventory quantities, and generate sales reports for effective business analysis, Warning Management: Implements a warning system to alert users about critical information related to drugs, such as impending expiration dates or recalls, ensuring adherence to safety protocols. It also provides the User-Friendly Interface and data security feature

Chapter 1

Introduction

In the ever-evolving landscape of healthcare, the efficient management of medical stores is integral to the seamless delivery of pharmaceutical services. Recognizing the complexities and challenges inherent in traditional manual systems, the project "Medical Store Management System" with Java emerges as a sophisticated and transformative solution. This initiative leverages the robust capabilities of the Java programming language to revolutionize the way pharmaceutical retail operations are orchestrated and managed.

The pharmaceutical sector, characterized by an extensive array of medications, suppliers, and regulatory intricacies, demands a systematic and technologically advanced approach to store management. Manual systems, prone to errors and inefficiencies, often struggle to keep pace with the dynamic nature of the industry. The Medical Store Management System aims to bridge these gaps, providing a comprehensive and automated platform that not only streamlines operations but also elevates the precision and reliability of medical store management.

Java, with its reputation for platform independence, scalability, and versatility, serves as the cornerstone of this project. The decision to utilize Java reflects a commitment to a technology that ensures the system's adaptability across various operating environments. This not only future-proofs the solution but also facilitates easy integration into existing healthcare infrastructures, promoting widespread accessibility.

The core functionalities of the Medical Store Management System encompass a spectrum of operations crucial to pharmaceutical retailing. The system facilitates seamless inventory management, empowering users to add, update, and delete drugs with precision. With features tailored to company management, users can efficiently handle pharmaceutical suppliers, adding and modifying company details as necessary. The sales transaction module ensures secure and efficient transactions, updating inventory quantities and providing comprehensive sales reports for informed decision-making.

One of the system's standout features is the warning management system, which serves as a proactive mechanism to alert users about critical information related to drugs. This includes impending expiration dates, recalls, or any vital information vital for ensuring the safety and efficacy of pharmaceutical products.

User-friendliness is prioritized through an intuitive graphical interface, making the system accessible to a broad audience, including individuals without extensive technical backgrounds. Additionally, robust data security measures are implemented, encompassing user authentication and authorization protocols, ensuring that sensitive information is safeguarded.

In essence, the "Medical Store Management System with Java" is not just a software solution; it represents a paradigm shift in how pharmaceutical retail operations can be conducted. By combining the power of Java with a thoughtful design tailored to the unique challenges of medical store management, this project aims to elevate the efficiency, accuracy, and overall effectiveness of pharmaceutical services, contributing to a more resilient and responsive healthcare ecosystem.

Chapter 2

Background and Motivation

The Medical Store Management System (MSMS) is a sophisticated software solution designed to streamline and optimize the operations of medical stores or pharmacies. The motivation behind developing such a system stems from the need to address the complexities and challenges faced by healthcare providers and pharmacists in managing inventory, sales, and overall store functionality. Traditional manual methods of record-keeping and inventory management often lead to inefficiencies, errors, and a lack of real-time insights.

The primary goal of the Medical Store Management System is to enhance the efficiency and accuracy of daily operations within a medical store. By leveraging technology, the system aims to automate inventory tracking, manage stock levels, and facilitate seamless sales transactions. Additionally, the system can assist in generating comprehensive reports, providing valuable insights into sales patterns, popular medications, and overall store performance [2]. The automation of routine tasks not only reduces the likelihood of errors but also allows pharmacists and healthcare professionals to focus more on patient care, ensuring a higher standard of service. In summary, the development of the Medical Store Management System is driven by the imperative to modernize and optimize pharmaceutical retail operations, fostering improved patient care and operational excellence in the healthcare industry.

2.1 Underlying Mechanism

Use of ICT in a pharmacy store is not up to date in our country, till now we are in the age of traditional manual system. In our survey, we found three methods have been used to manage inventory and purchase orders in most of the pharmacies. Most of the pharmacies are doing a lot of paper works to track availability of stocks as well as reorder level of medicines which are very erroneous and also a very tedious task. Tracking expire date of each medicine is not possible using manual paper works. Besides, maintenance of these papers is also very important and crucial. A very few pharmacies use a basic inventory management system which is also a desktop version. The rest do not use any system that means they have no tracking system, they just buy and sale.

In our survey, we found there are a very few pharmacies like Sumon Medical Store use a basic medicine store management software which is a desktop based application. It provides only basic functionalities. We have found some application for only searching medicine and dosage details. In our findings, our system has some unique features which are not integrated with the similar systems. With the existing desktop version system, a pharmacy has to invest a lot to use that system which is a big challenge for all type of pharmacies in our country. In our survey, we have explored that the previous systems have many desirable and undesirable attributes. We have gained valuable experience with the previous systems.

2.2 Objective of Project and Possible Outcomes

The main objective of the Project on Medical Store Management System is to manage the details of Medicine, Medicine Companies, Medicine Stocks, Sells, and Store shelves. The project is built at the administrative end and thus only the administrator is guaranteed access. The purpose of the project is to build an application program to reduce the manual work for managing the drugs, suppliers, Medicine Companies, and shelf numbers to ensure easily find out the medicine, and quantity of medicines.

Functionalities provided by Medical Shop Management System are as follows:

- Provides the facilities based on various factors. Such as drugs details, Medicine Company, Medicine Stocks, Sells and arrangement of drugs in shelves.
- Medical Shop Management System also manages the Supplier details online for Medicine Stock details, Sells details, Customer.
- It tracks all the information of Medicine, Supplier, Medicine Stock ect
- Manage the information of Medicine
- Shows the information and description of the Medicine Company
- To increase efficiency of managing the drug selling of medicine.
- It deals with monitoring the information and transactions of Medicine Stock.
- Editing, adding and updating of Records is improved which results in proper
- Manage the information of Medicine Stock
- Integration of all records of Sells.

2.3 Scope of the project Medical Shop Management System

It may help collecting perfect management in details. In a very short time, the collection will be obvious, simple and sensible. It will help a person to know the management of passed year perfectly and vividly. It also helps in current all works relative to Medical Store Management System. It will be also reduce the cost of collecting the management & collection procedure will go on smoothly [10].

Our project aims at Business process automation, i.e. we have tried to computerize various processes of Medical Store Management System.

- In computer system the person has to fill the various forms & number of copies of the forms can be easily generated at a time.
- In computer system, it is not necessary to create the manifest but we can directly print it, which saves our time.
- To assist the staff in capturing the effort spent on their respective working areas.
- To utilize resources efficiently by increasing their productivity through automation.
- The system generates types of information that can be used for various purposes.
- It satisfy the user requirement
- Be easy to understand by the operator
- Be easy to operate

- Have a good user interface
- Be expandable
- Delivered on schedule within the budget.

Chapter 3

Software Requirement Specification

The Software Requirements Specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description, a detailed functional and behavioral description, an indication of performance requirements and design constraints, appropriate validation criteria, and other data pertinent to requirements [7].

The proposed system has the following requirements:

- System needs store information about new entry of Medical Shop.
- System needs to help the internal staff to keep information of Stocks and find them as per various queries.
- System need to maintain quantity record.
- System need to keep the record of Company.
- System need to update and delete the record.
- It also needs a security system to prevent data.

3.1 Identification of need

The old manual system was suffering from a series of drawbacks. Since the whole of the system was to be maintained with hands the process of keeping, maintaining, and retrieving the information was very tedious and lengthy. The records were never used to be in a systematic order. There used to be lots of difficulties in associating any particular transaction with a particular context. If any information was to be found it was required to go through the different registers and documents there would never exist anything like report generation. There would always be unnecessary consumption of time while entering records and retrieving records. One more problem was that it was very difficult to find errors while entering the records. Once the records were entered it was very difficult to update these records.

The reason behind it is that there is a lot of information to be maintained and has to be kept in mind while running the business. For this reason, we have provided features Present system is partially automated (computerized), actually, the existing system is quite laborious as one has to enter the same information at three different places.

The following points should be well considered:

- Documents and reports that must be provided by the new system: there can also be a few reports, which can help management in decision-making and cost controlling, but since

these reports do not get the required attention, such kinds of reports and information were also identified, and given the required attention.

- Details of the information needed for each document and report.
- The required frequency and distribution for each document.
- Probable sources of information for each document and report.
- With the implementation of a computerized system, the task of keeping records in an organized manner will be solved. The greatest of all is the retrieval of information, which will be at the click of the mouse. So the proposed system helps in saving time in different operations and making information flow easy giving valuable reports.

3.2 Feasibility Study

After doing the project Medical Store Management System, study and analyze all the existing or required functionalities of the system, the next task is to do the feasibility study for the project. All projects are feasible - given unlimited resources and infinite time. The feasibility study includes consideration of all the possible ways to provide a solution to the given problem. The proposed solution should satisfy all the user requirements and should be flexible enough so that future changes can be easily done based on future upcoming requirements.

A. Economical Feasibility

This is a very important aspect to be considered while developing a project. We decided the technology based on minimum possible cost factor.

- All hardware and software cost has to be borne by the organization.
- Overall we have estimated that the benefits the organization is going to receive from the proposed system will surely overcome the initial costs and the later on running cost for system.

B. Technical Feasibility

This included the study of function, performance and constraints that may affect the ability to achieve an acceptable system. For this feasibility study, we studied complete functionality to be provided in the system, as described in the System Requirement Specification (SRS), and checked if everything was possible using different type of frontend and backend platforms.

C. Operational Feasibility

No doubt the proposed system is fully GUI based that is very user friendly and all inputs to be taken all self-explanatory even to a layman. Besides, a proper training has been conducted to let know the essence of the system to the users so that they feel comfortable with new system. As far our study is concerned the clients are comfortableand happy as the system has cut down their loads and doing.

Chapter 4

System Design and Methodology

The specific objective of the proposed system is to develop a Web-based Medical Store Management System for Pharmacy. Our dynamic web-based MSMS provides more functionalities besides the basic features as well as user-friendly access. Our proposed system is available only offline and for the operator. In this system, we have implemented Java Programming language to explore our project. UML (Unified Modeling Language) is used for the model design. The interface between the front end and the back end is through MySQL (in XAMPP). The front end is designed using Java Swing libraries. The structures, query evaluation and optimization, concurrency control, and recovery of the database is controlled by MySQL. NetBeans and also Eclipse IDE were used as front-end to develop forms, report-trail, and graphical user interfaces [3].

4.1 Modules of Medical Store Management System

- **Login Module:** Used for log into the management system used by the operator. Operator logs in using the username and the password specified when designing the project(default username: admin, password: admin@123)
- **Drugs Module:** This module shows the list of the drugs with their name, type, price, expiry days, company, shelf no. , and quantity. Here we can add a new drug and also delete a drug. From this module operator searches the drugs and sells by using the sales tabs.
- **Medicine Company Module:** Used for managing the Medicine Company details
- **Warning Module:** List of drugs whose expiry date is coming soon
- **Sells Module:** Used for managing the details of Sells. This module shows the total sold items and also shows every day sold items. Here the specific item can be updated as per basis.
- **Medicine Management Module:** Used for managing the information and details of the Medicine.
- **Medicine Stock Module:** Used for managing the Medicine Stock.

4.2 System Design

In this work, we have used UML to analyze, design, and implement our project for a medical shop. The UML is now the most widely used graphical representation scheme for modeling the objects of any system. An attractive feature of UML is its flexibility. UML modelers are free to use various processes in designing systems. In this paper, we have designed the following five UML diagrams to explain the behavior as well as the relationship of the components of our inventory management system [6]. These are different types of diagrams and models used in software development to represent various aspects of a system.

1. Data Flow Diagram (DFD)
2. Use Case Diagram
3. Software Architectural Model
4. Relational Database Model

4.2.1 Data Flow Diagram (DFD)

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its process aspects. A DFD is often used as a preliminary step to create an overview of the system without going into great detail, which can later be elaborated. We have shown an overview of flow for our MSMS in the following level-1 DFD diagram. Customer who wants buy medicine, asks to seller and seller processes the order and receives payment and prints receipt [8]. All these information are stored in the database. Manager can generate purchase order which will automatically sends to the suppliers or MPO by email or other systems. Pharmacist verifies all received medicines from suppliers and manager add these into inventory database.

4.2.1.1 Zero Level DFD

This is the Zero Level DFD of Medical Shop Management System, where we have eloborated the high level process of Medical Shop. It's a basic overview of the whole Medical Shop Management System or process being analyzed or modeled. It's designed to be an at-a-glance view of Payment, Stock and Sales showing the system as a single high-level process, with its relationship to external entities of Medicine, Medicine Company and Shop. It should be easily understood by a wide audience, including Medicine, Shop and Payment In zero leve DFD of Medical Shop Management System, we have described the high level flow of the Medical Shop system.

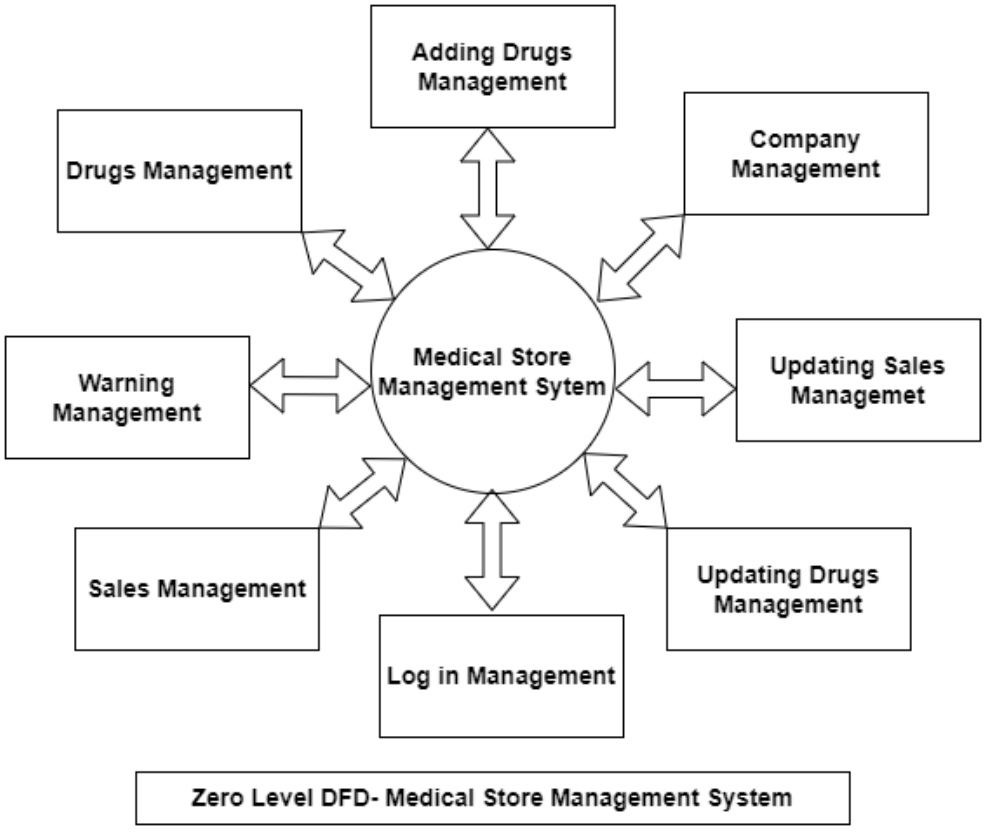


Figure 4.1: Zero Level DFD

4.2.1.2 Level 1 DFD

In the context of a Medical Store Management System (MSMS), a Level 1 Data Flow Diagram (DFD) provides a more detailed representation of the system's processes, data stores, and data flows. At this level, the focus is on expanding the processes identified in the Level 0 DFD and breaking them down into sub-processes or modules. Here's an explanation of the components typically found in a Level 1 DFD for a Medical Store Management System. Here the following graph shows the level 1 DFD for MSMS [5].

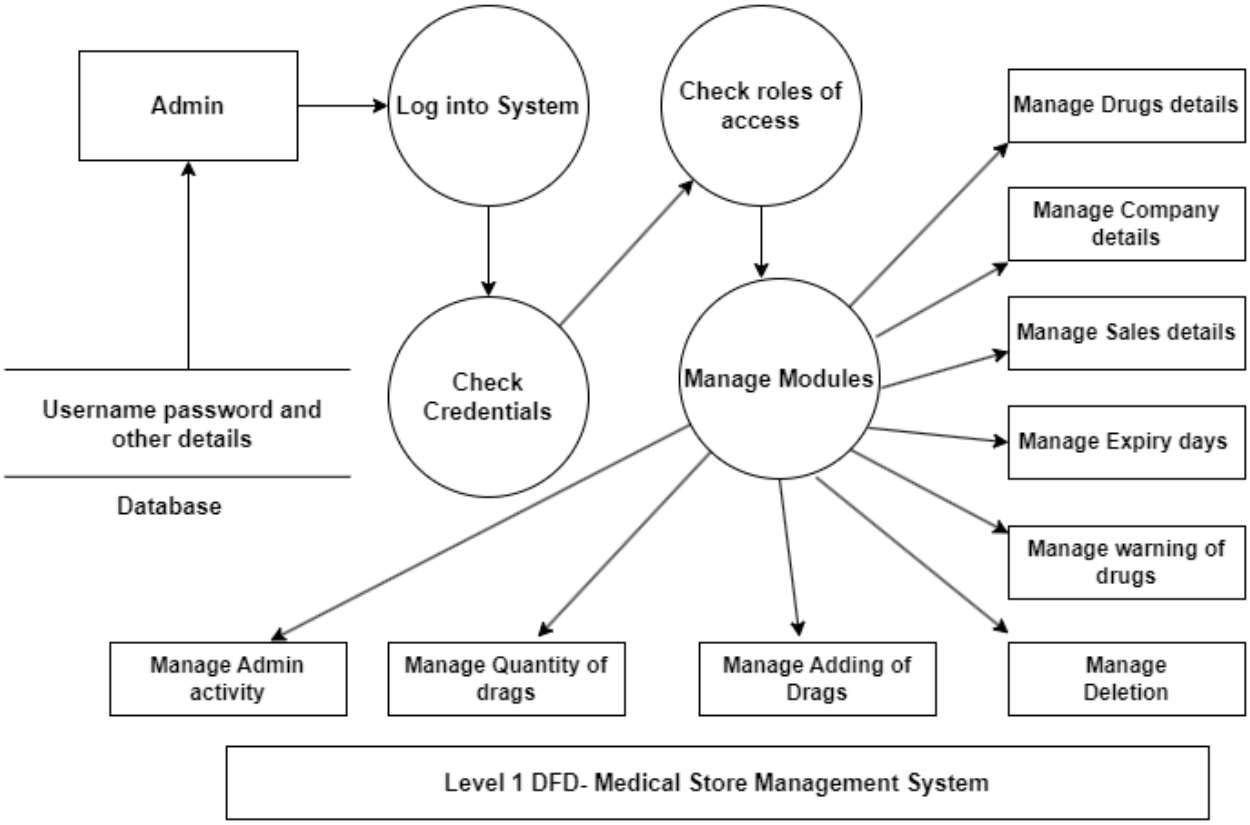


Figure 4.2: Level One DFD

4.2.2 Use Case Diagram

In a Use Case Diagram for a Medical Store Management System, you can represent the interactions between various entities and their functionalities [4]. Here's a description based on the entities you mentioned:

Actors:

- **User:** Represents the individuals interacting with the system.

Use Cases:

- **Manage Drugs**:

- **Add Drug**: The user can add a new drug to the system, specifying details such as drug name, manufacturer, expiry date, price, and quantity.
- **Update Drug**: Allows the user to modify the information of an existing drug, such as updating the quantity, price, or other attributes.
- **Delete Drug**: Enables the user to remove a drug from the inventory.
- **Sales:** Represents the process of selling a drug, involving updating the quantity available and recording the transaction details.

- **Manage Companies:**
  - **Add Company**: Permits the user to add a new pharmaceutical company to the system.
  - **Update Company**: Allows the user to modify information about an existing pharmaceutical company.
  - **Delete Company**: Enables the user to remove a company from the records.
- **Warning Management:**
  - Receive Warning: The system alerts the user about warnings related to specific drugs, such as expiry dates or recalls.
- **Sales:**
  - Make Sale: Involves the user initiating a sales transaction, updating the drug quantities in the inventory, and recording the sale details.
- **View Sales History:** Allows the user to access a record of past sales transactions.
- **Log Out:** The user can log out of the system, terminating the current session.

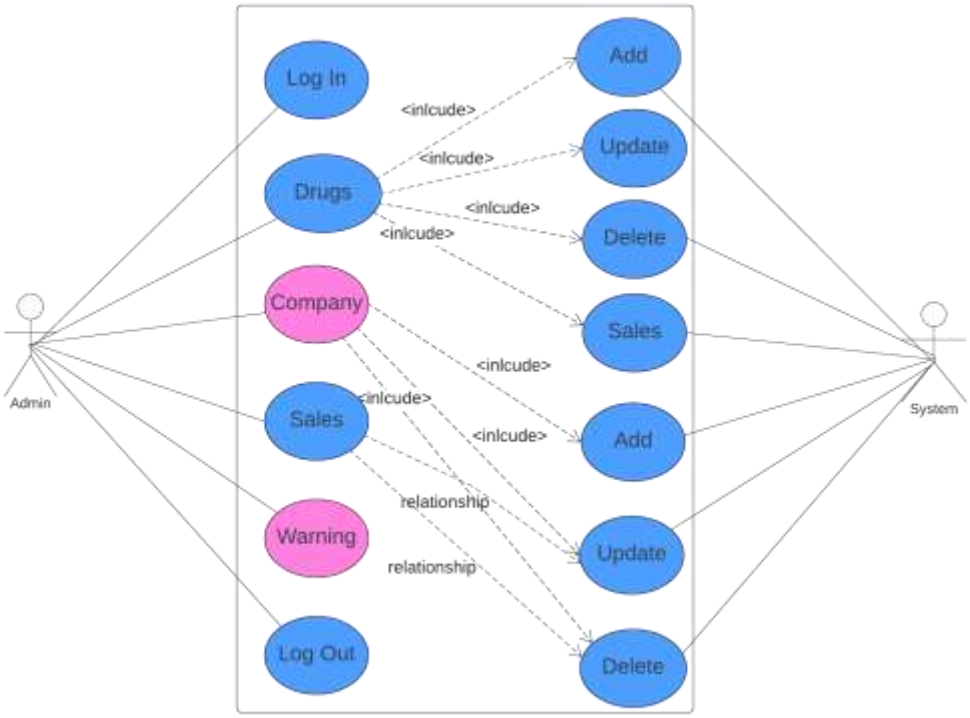
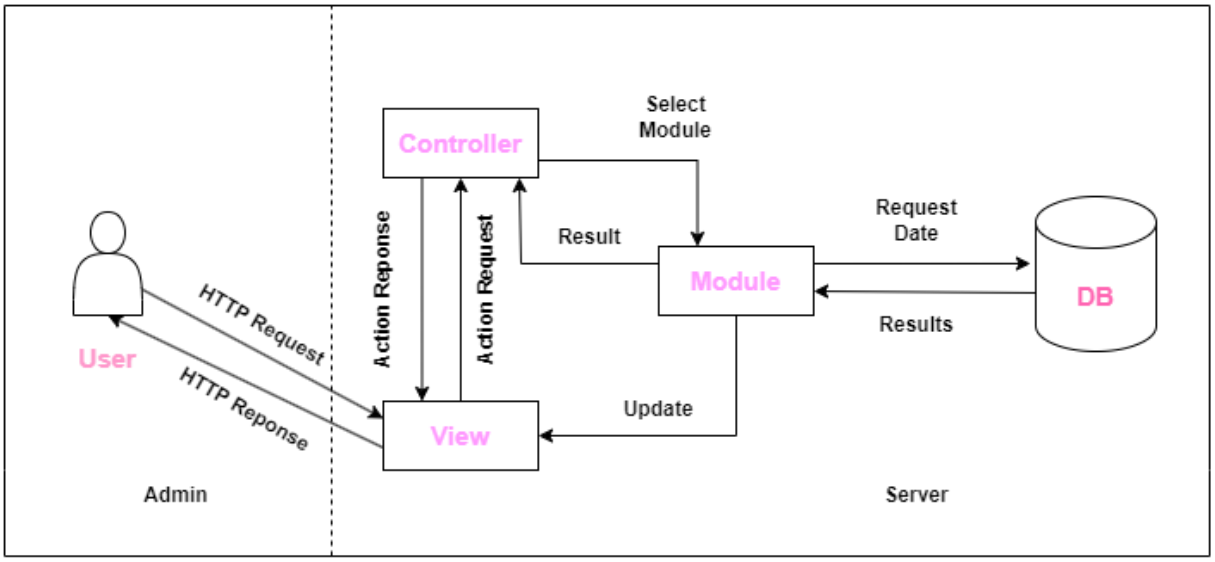


Figure 4.3: Use Case Diagram

4.2.3 Software architecture

Software architecture refers to the high level structures of a software system. The architecture of a software or computing system is the structure or structures of the system, which comprise software elements, the externally visible properties of those elements, andn the relationships among them. Store management system software is implemented the following admin -server architecture [9]. MVC design pattern that divides an application into three interconnected parts, is implemented on the server side to separate the application's user interface from the business logic.



Module View Controller(MVC) Architecture of MSMS

Figure 4.4: MVC Diagram

4.2.4 Relational Database Model

ER Diagram for proposed system:

This ER (Entity Relationship) Diagram represents the model of Medical Store Management System Entity. The entity-relationship diagram of our system shows all the visual instruments of database components and the relations among the entities. The following ER diagram for the medical store depicts the Medical Store Management System, which manages the details of Sells, Medicines (drugs), Stocks, Company, and Warning, addition and deletion of drugs [1]. It keeps track of all the Sells, Medical shops, and Sells. This ER diagram for the developed management system depicts the flow of activity through a sequence of actions. The activity diagram is a critical diagram for describing the system. The activity is defined as a system action or operation. An activity diagram depicts the overall control flow.

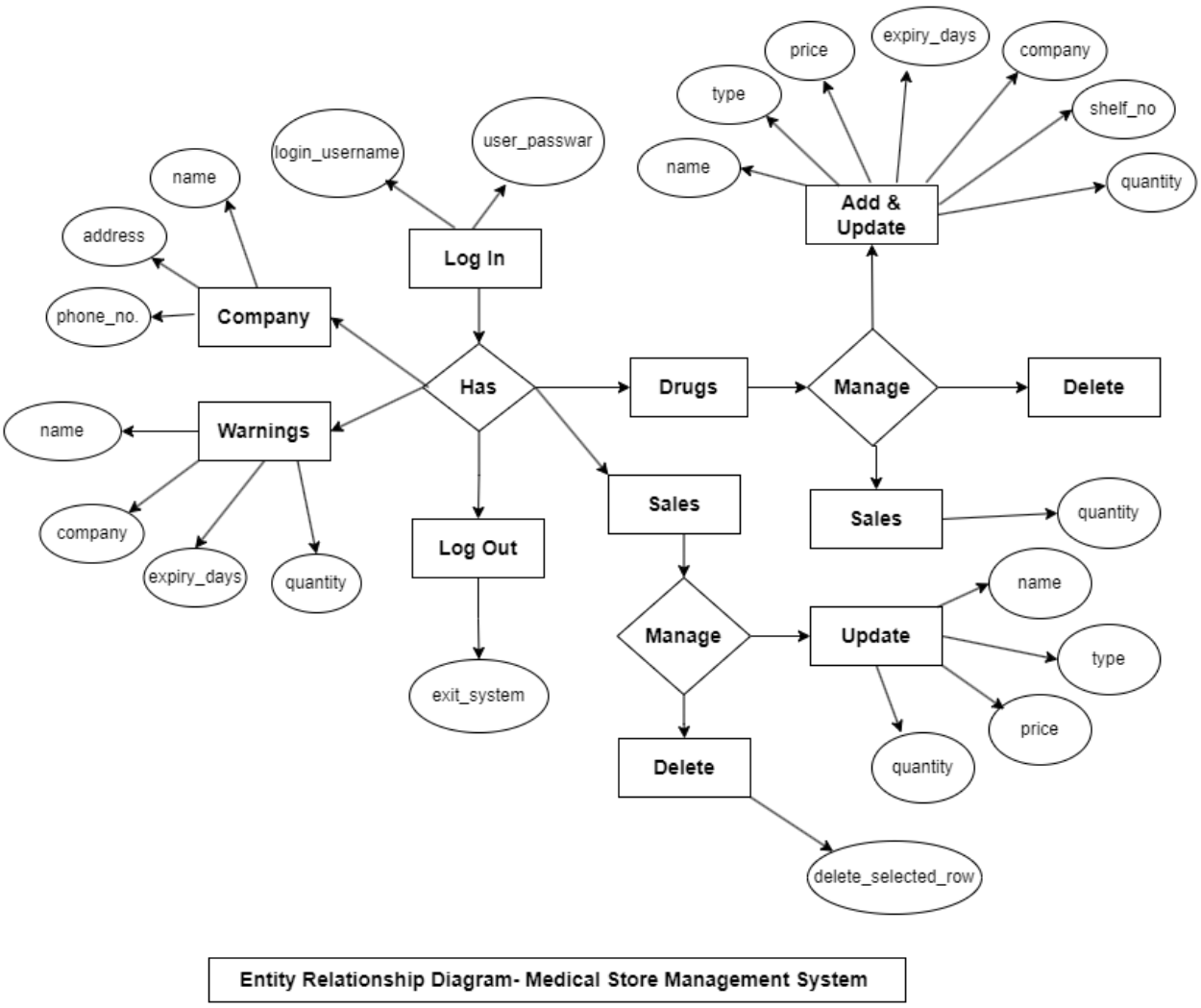


Figure 4.5: ER diagram

4.3 Hardware and Software Requirements

Software Requirements:

Name of component	Specification
Operating System	Any of the existing OS
Language	Java
Database	MySQL Server
Browser	Any of Mozilla, Opera, Chrome etc
Software Development Kit	JDK 1.7 or Above
Database JDBC Driver	MySQL connector

Hardware Requirements:

Name of component	Specification
Processor	Any of the existing processor
RAM	Minimum 1GB
Hard disk	Minimu 2 GB
Monitor	15” color monitor

Chapter 5

Implementation and Output

5.1 Welcome Page

This is the welcome page of our system and by clicking the next button we can proceed to further module.

Figure 5.1: Welcome Page

5.2 Admin Page

This is the admin page from which an operator get access to the system. By entering previously specified username and password while designing the system correctly an store operator enters the system.

Figure 5.2: Admin Page

5.3 Home Page

The following figure shows the home page for our proposed application.

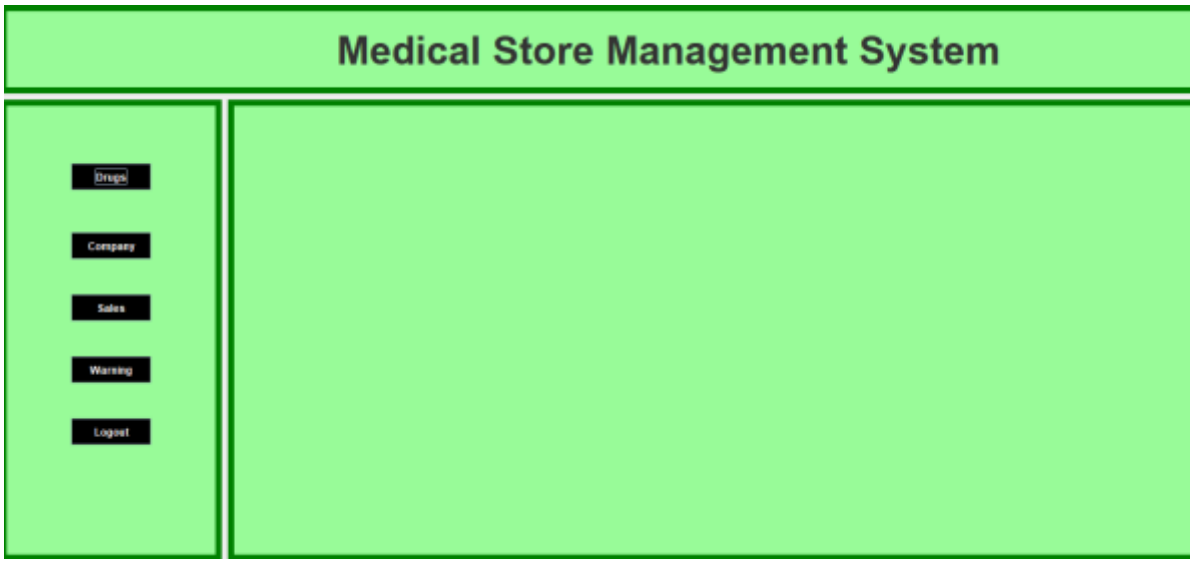


Figure 5.3: Home Page

5.4 Drugs List

The drugs module depicts the list of the drug. Here we have some submodules by which we can manipulate the drugs list.

Figure 5.4: Drugs List

5.4.1 Add New Drug

Through this module we can add new drugs with the drug name, type, price of each piece of the medicine, total expiry day's, the company name from which we brought the product, quantity of the drug and the shelf no. where we store the drug.

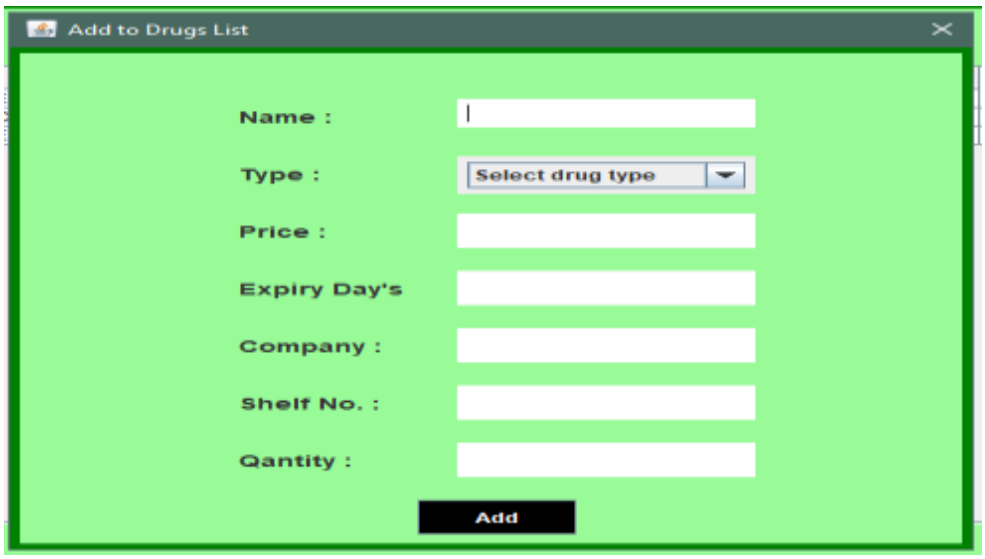


Figure 5.5: Addition of Drug

5.4.2 Update Drug Details

If any error in the addition of any drug we can update the drug.

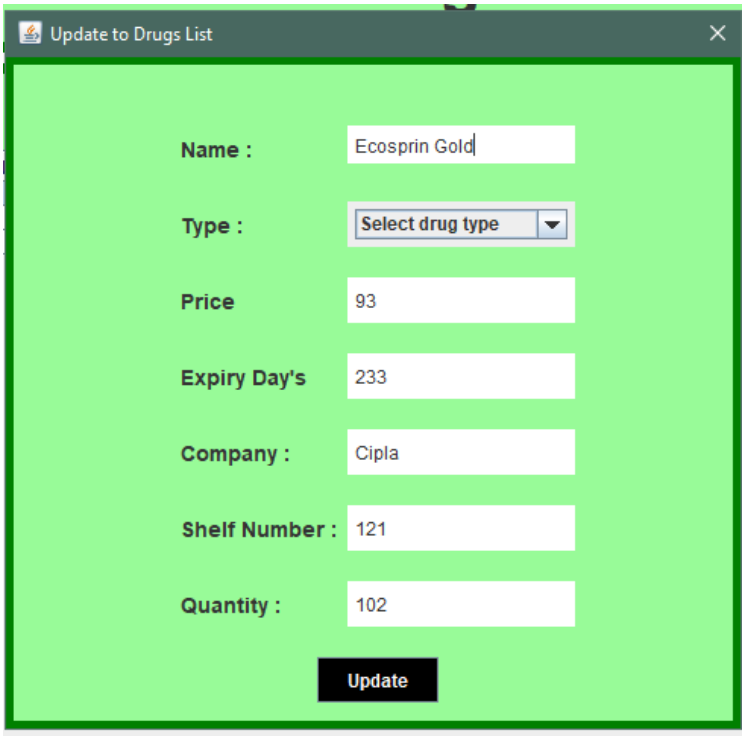


Figure 5.6: Update of Drugs

5.4.3 Deletion of Drugs

After selecting the row of desired drugs we can delete that row.

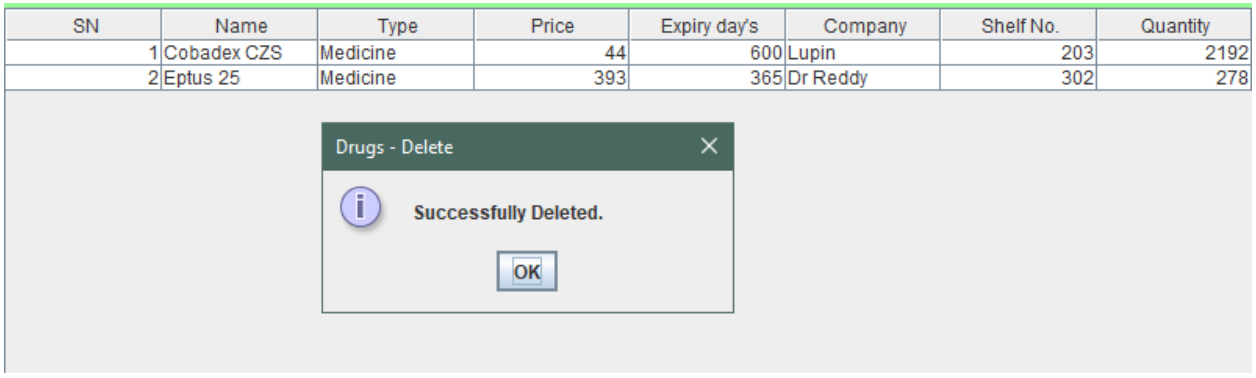


Figure 5.7: Deletion of Drugs

5.5 Company list

This module shows the list of companies from which the shop buy their medicine. It includes the company name, address and phone number.

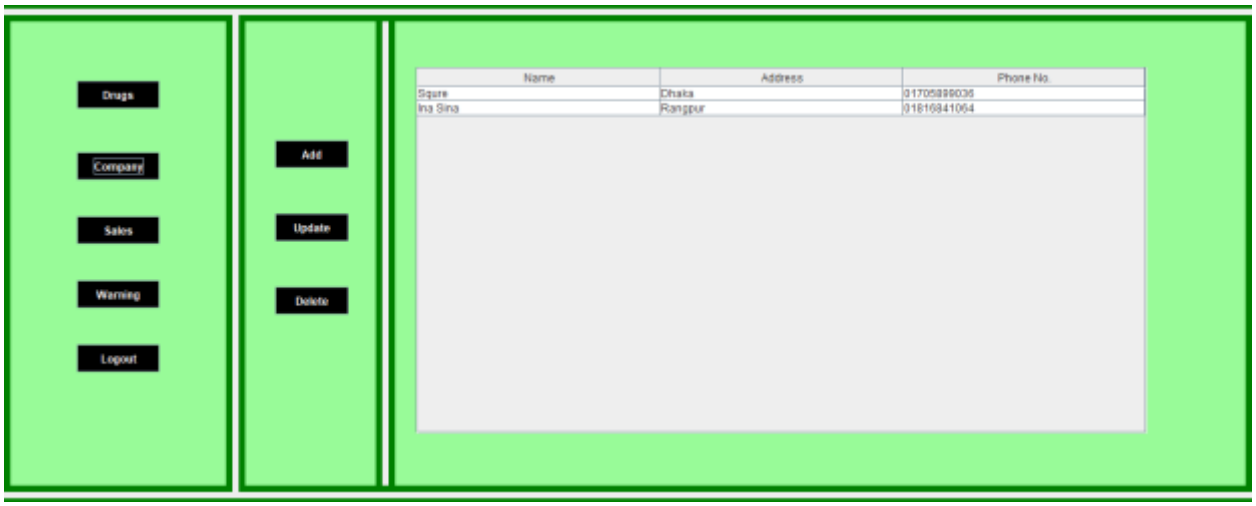


Figure 5.8: Company List

5.6 Drug Sales

To sell a drug we have to click on the row of that drug then show an pop up frame where we have to enter the quantity of drugs.

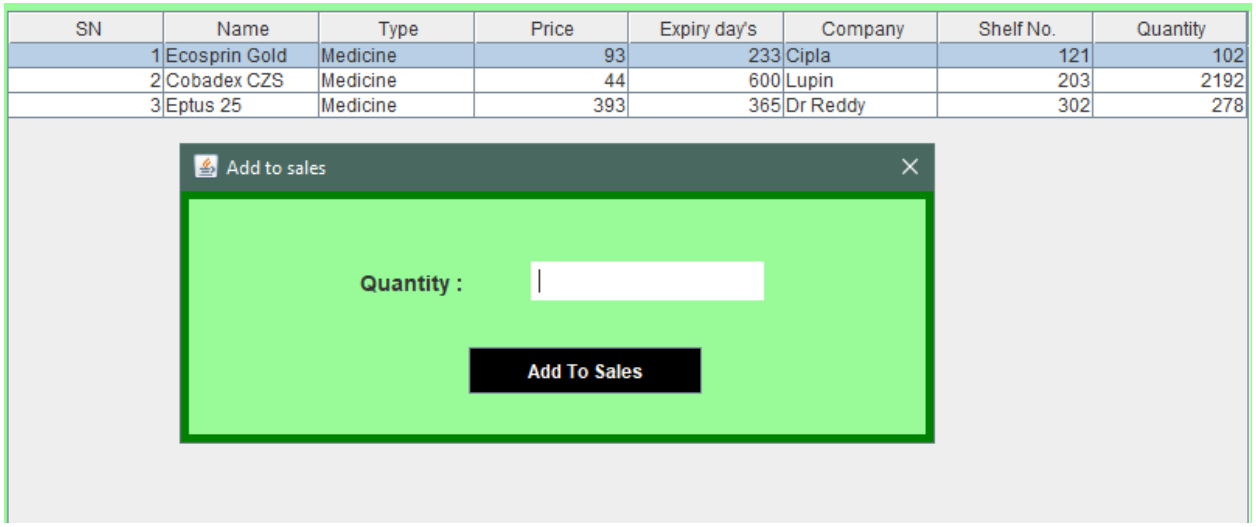


Figure 5.9: Drug Sales

5.6.1 Sales Details

The following figure shows the list of drugs which are sold and also shows today's total sold money and grand total.

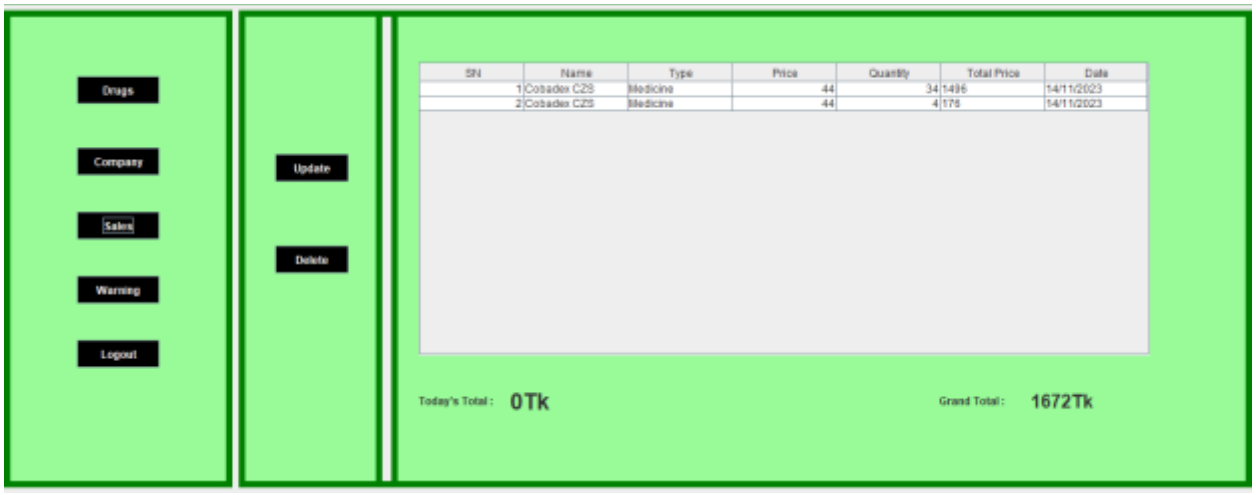


Figure 5.10: Sales Details

5.6.2 Update Sales

To update a specific drugs in the sales entity first of all we have to select the row. Then it shows a pop up frame then we can edit the name, type, price, quantity and at last press the update button.

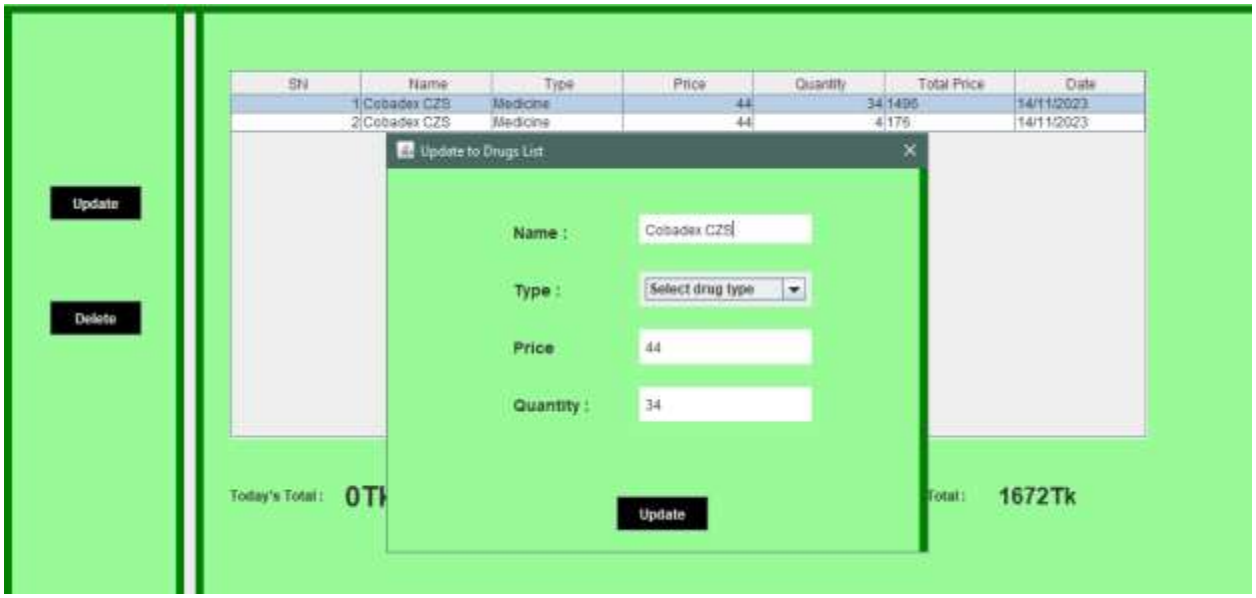


Figure 5.10: Update Sales

5.6.3 Delete Sells

After selecting the desired row that we want to delete press the ok button then it shows a pop up frame where the deletion message is showed as “successfully deleted”.

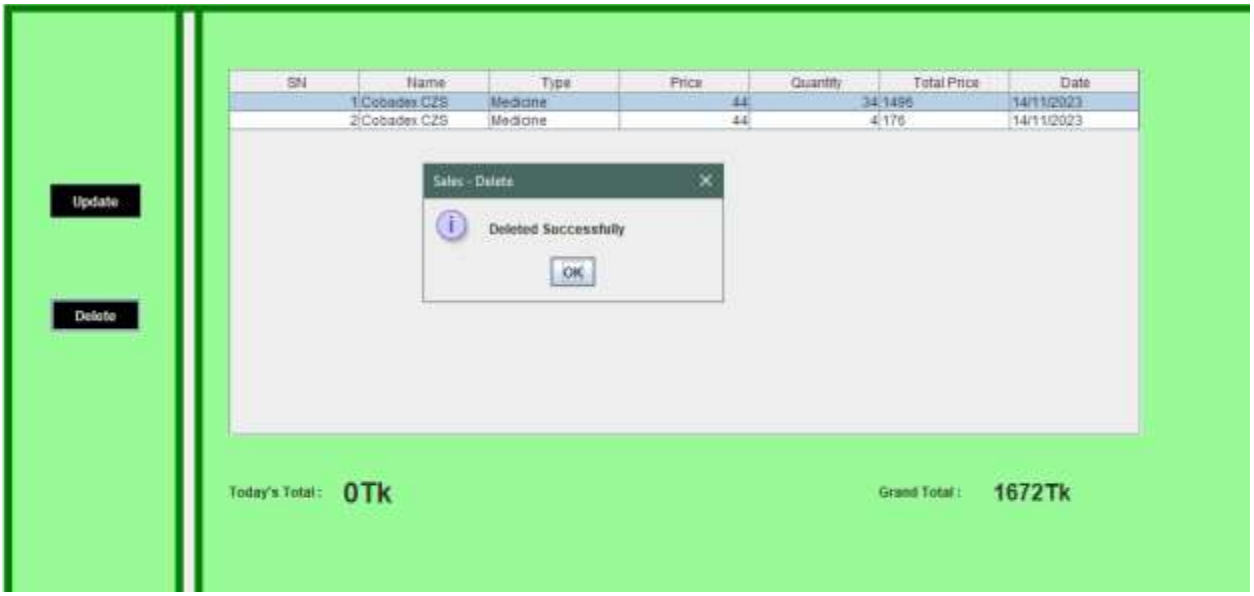


Figure 5.11: Delete Sales

5.7 Warnings of Drugs

This page shows the name, type, expiry days and quantity of the drugs whose expiry days are coming soon and also the quantity is less.

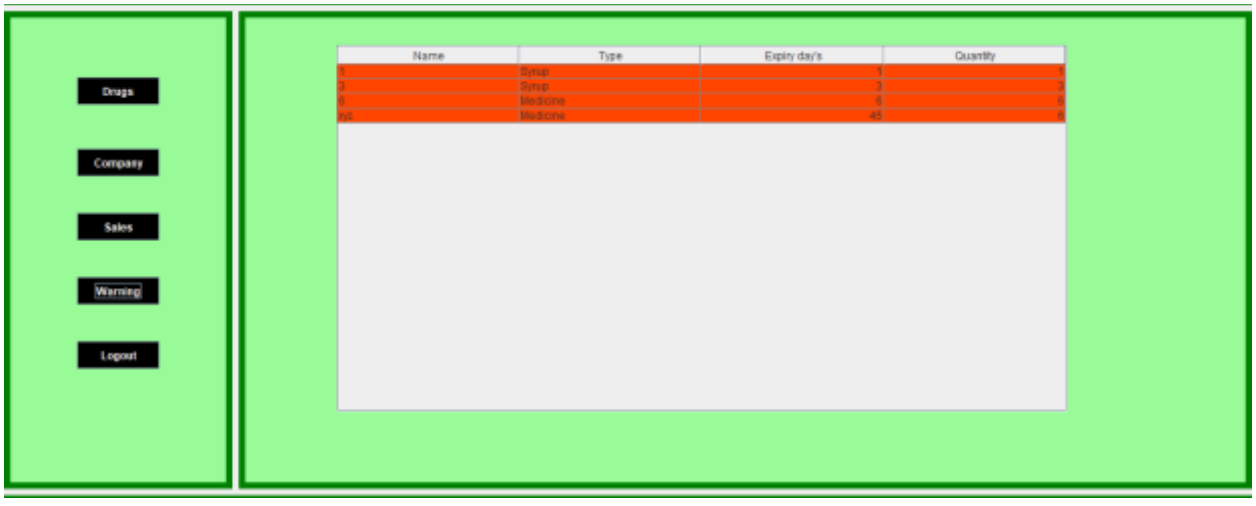


Figure 5.12: Warnings of Drugs

Chapter 6

Conclusion and Future works

In conclusion, the "Medical Store Management System" stands as a pivotal advancement in the realm of pharmaceutical retail operations. By harnessing the capabilities of Java programming, this project has successfully addressed the inherent challenges of manual systems, providing a comprehensive and automated solution for medical store management. The robust features, including inventory management, sales transactions, and warning systems, are poised to enhance precision, efficiency, and overall reliability in pharmaceutical retail [11].

The commitment to user-friendliness ensures that this system is accessible to a diverse user base, allowing for seamless integration into various healthcare settings. The emphasis on data security and the implementation of user authentication safeguards sensitive information, ensuring the integrity of the medical store management process.

6.1 Future Work

As technology and healthcare continue to evolve, the "Medical Store Management System with Java" offers a strong foundation for future enhancements and developments. Potential avenues for future work include:

- **Integration with External Systems:** Explore opportunities for integration with external systems, such as electronic health records (EHR) or healthcare management systems, to create a more holistic approach to healthcare service delivery.
- **Advanced Analytics and Reporting:** Enhance the system's reporting capabilities by incorporating advanced analytics. This could involve predictive analytics for inventory planning, sales forecasting, and trend analysis to further optimize medical store operations.
- **Mobile Application:** Develop a mobile application version of the system to empower users with on-the-go access, facilitating real-time updates and remote management capabilities.
- **Machine Learning for Warning Systems:** Implement machine learning algorithms to enhance the warning system. This could involve predicting potential issues based on historical data, leading to more proactive management of drug-related concerns.

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