

PHARMACY MANAGEMENT SYSTEM ALONG WITH E-PRESCRIPTION GENERATION

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Abstract: To back the conveyance of persistent care, apportioning of Medicine and stock administration are vital issues. In specific, it screens and records the Patients points of interest. The Quiet will be allotted with unique-id after the enrollment completes. PMS shows the patient's individual points of interest and wellbeing reports/ therapeutic E Medicine. In conjunction with Automatic alert system i.e. the remainder will be given to Pharmacist on stock coming to least level. Electronic endorsing (e-prescribing) permits Pharmacist to arrange and send medicines electronically based on the medicine -id. It stores all charging information for apportioned medicine.

Index Terms: Pharmacy Management System (PMS), Electronic Pharmacy Record (EPhR), Electronic prescribing.

Introduction: The developed application is designed with a primary focus on enhancing patient care. It addresses a significant challenge that patients commonly face: the availability of medicines and comprehensive information about them. Additionally, the application aims to provide patients with detailed insights into their health conditions, reducing their dependency on frequent medical consultations solely for medication-related purposes. Within the application, a comprehensive repository of patient information is maintained, encompassing medication details and schedules. Furthermore, the application encompasses a pharmacy module, allowing patients to procure prescribed medications

conveniently. The pharmacy module features a comprehensive inventory management system that tracks medicine quantities and types available in stock. By integrating these functionalities, the application aims to streamline patient self-care and provide a more accessible approach to medication management and health information.

Literature survey: The paper presents a Pharmacy Management System (PMS) based on Spring and Hibernate, designed [1] to support the delivery of patient care, dispensing of drugs and stock management are important issues. In particular, techniques for Electronic Pharmacy Record (EPhR), where it monitors and records the

patients progress. The system incorporates features such as Electronic Pharmacy Record (EPhR), which monitors and records patient progress, and assigns unique IDs to patients for tracking purposes. It enables pharmacists to provide prescriptions, maintain patient visit histories, and store drug information for easy retrieval. Automatic alerts are generated for stock reaching minimum levels, facilitating online stock order requests. The system supports role-based access control, assigning users to roles based on job responsibilities and granting access privileges accordingly. It emphasizes the importance of security measures to protect patient information, including logging out inactive users and revoking access for former employees.

Furthermore, the paper discusses the significance of electronic prescribing (e-prescribing) in enhancing the safety and quality of the prescribing process. E-prescribing allows providers to electronically send prescriptions to pharmacies, either as a standalone system or integrated within an electronic health record system. The study evaluates the performance of the proposed protocol and highlights barriers to e-prescribing implementation, such as cost, lack of provider support, patient privacy concerns, system errors, and legal issues. Additionally, the paper touches upon Personal Health Record (PHR) systems, emphasizing the ongoing research and evaluation efforts to enhance their functional and technical capabilities.

In summary, the Pharmacy Management System outlined in the paper aims to streamline pharmacy operations, improve patient care delivery, and enhance medication management through innovative features and robust security measures.

The paper titled "Lightweight and Secured (CB-PS) Scheme for E-Prescription Systems" says, [2] Electronic prescription (E-prescription) is an emerging technology that allows health practitioners (doctors, physicians, pharmacists, or nurses) to electronically transmit prescriptions to pharmacies. It presents a novel approach to enhancing the security and efficiency of E-Prescription Systems through the development of a Certificate-Based Proxy Signcryption (CB-PS) scheme. The scheme aims to provide secure electronic transmission of prescriptions from healthcare providers to pharmacies.

Key points covered in the paper include:

1. Introduction of the CB-PS scheme for E-Prescription Systems.
2. Comparison with existing Proxy Signcryption (PS) schemes, highlighting limitations and advantages.
3. Description of the system architecture and construction of the proposed CB-PS algorithm.
4. Security analysis through formal methods using the AVISPA tool and informal analysis covering various security measures.

5. Performance evaluation through computing and communication cost comparison with existing schemes.
6. Overview of the adversary model considered for the proposed scheme.
7. Authors' contributions, including the syntax of certificate-based proxy signcryption, network model, algorithm construction, and security analysis.
8. Organizational structure of the paper, including sections on preliminaries, related work, system architecture, scheme construction, implementation, security analysis, efficiency, and conclusions.

Proposed Solution: In our proposed extend, the proposed system PMS gives authorized Pharmacists with the capability to make, get to, and overhaul patient-specific pharmaceutical profile. Each persistent will be assigned with a special patient identifier inside the PMS. A drug specialist screens the patient's progress and it is recorded within the Electronic Pharmacy Record. The data's can be gotten to by anybody who enters the Pharmacy as no unique-id is relegated for each persistent. Programmed caution data on stock coming to least level and online ask era of stock arrange. Pharmacists-id is fundamental for guaranteeing that the patients can contact the Pharmacists in case extra data is needed. PMS must back role-based get to control by allotting clients to parts based upon their work duties, and doling out parts to get to benefits based upon the data get to needs of the clients carrying out those parts. Role-

based get to control permits diverse clients to have distinctive levels of get to depending on their work capacities. PMS must, for each medicine, clearly distinguish the persistent and the patient's ID as found in a jurisdictional client registry, where such a registry exists. PMS stores all charging information for apportioned drugs and keeps up the charging data with a one of a kind bill-id. To bolster the conveyance of quiet care, apportioning of medicine and stock administration are imperative issues. In specific, it screens and records the persistent points of interest. The Patient will be relegated with unique-id after the registration completes. PMS shows the patient's individual points of interest and wellbeing reports/ therapeutic E-prescription. Together with this, automatic alert system i.e. the remainder will be given to pharmacist on stock reaching minimum level. Electronic prescribing (e prescribing) allows Pharmacists to order and send prescriptions electronically based on the prescription -id. It stores all billing data for dispensed drugs.

Implementation:

ADMIN MODULE: The admin module typically includes a wide range of tools and functionalities to streamline administrative tasks and improve overall efficiency.

The admin module is a critical component of a Property Management System, as it empowers administrators to efficiently oversee the day-to-day operations, enhance guest experiences, and maximize revenue

while maintaining a high level of control and security.

PHARMACIST MODULE: In a Pharmacy Management System (PMS), the pharmacist module is a key component designed to assist pharmacists and pharmacy staff in efficiently managing the various aspects of their pharmacy operations. This module is specifically tailored to the unique needs and workflow of a pharmacy. Here's a description of the key features and functionalities typically found in a pharmacist module within a PMS:

- **Prescription Management:** This module allows pharmacists to receive, process, and store electronic or paper prescriptions from healthcare providers. It may include tools for verifying the authenticity of prescriptions and ensuring compliance with legal requirements.
- **Patient Profiles:** Pharmacists can create and maintain patient profiles, including contact information, medication history, allergies, and insurance details. This enables pharmacists to provide personalized care and identify potential drug interactions.
- **Medication Dispensing:** Pharmacists can use the module to accurately dispense medications, including the selection, labeling, and packaging of medications. The system may include barcode scanning to ensure accuracy.

- **Inventory Management:** The pharmacist module helps manage pharmacy inventory by tracking stock levels. It can generate alerts when stock is low and assist in reordering supplies.
- **Drug Interactions:** The module may provide alerts and warnings about potential drug interactions when a new prescription is processed, helping pharmacists avoid dangerous medication combinations.
- **Billing and Insurance:** Pharmacists can use this module to process payments, bill insurance providers, and manage co-pays. It may also handle claims and insurance verification.
- **Patient Education:** Pharmacists can provide patients with information about medication use, side effects, and proper storage. The module may include resources like patient handouts.
- **Compliance Monitoring:** Pharmacists can monitor and promote patient adherence to medication regimens. The system may generate reminders for prescription refills or dosage reminders.

PATIENT MODULE: In a Pharmacy Management System (PMS), the "patient module" is a crucial component that focuses on managing patient-related information and interactions within the pharmacy setting. This module facilitates efficient and

accurate healthcare service delivery to patients who visit the pharmacy. Here's a description of what a patient module in a PMS might include:

- **Patient Registration:** The patient module allows pharmacy staff to register new patients by collecting their demographic information, contact details, and insurance information. It may also verify patient identity and ensure the accuracy of the information.
- **Patient Profiles:** Each registered patient has a dedicated profile that includes essential details such as name, date of birth, gender, contact information, and a unique identifier (e.g., medical record number).
- **Medication History:** The module maintains a comprehensive medication history for each patient, including records of prescribed medications, dosage information, and any known allergies or sensitivities. This information is essential for avoiding potential drug interactions and ensuring patient safety.
- **Prescription History:** The module tracks the prescriptions filled by the patient at the pharmacy, including the medication, dosage, prescribing physician, and dispensing date.
- **Billing and Insurance:** The patient module integrates with billing and insurance information to handle prescription payments, co-pays, and

claims processing. It can verify insurance coverage and provide patients with accurate billing information.

- **Appointment Scheduling:** Some pharmacy systems may include a feature for scheduling patient consultations with pharmacists or other healthcare professionals for medication therapy management.

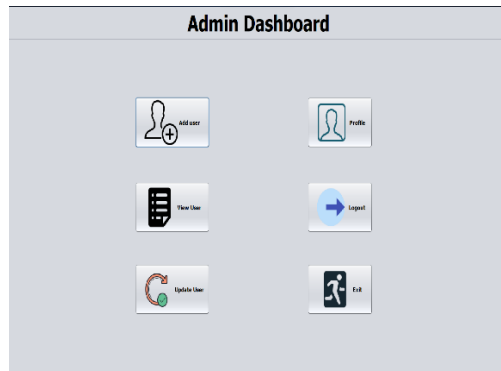
Program Files:

Login.java: Handles user authentication and login functionality in the PMS, verifying user identity, validating credentials, managing user roles and permissions, session management, and password security.



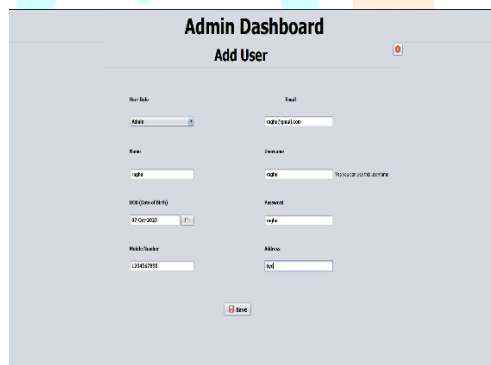
Login Page

AdminDashboard.java: Central interface for administrators and pharmacy managers in the PMS, facilitating efficient oversight of pharmacy operations, including user authentication, GUI, medication inventory management, prescription handling, billing, and user management.



Admin Dashboard

AddUser.java: Facilitates user account management within the system, including user registration, role and permission assignment, authentication, user profile management, password handling, role-based access control, security measures, user list and management, and user permissions requests.



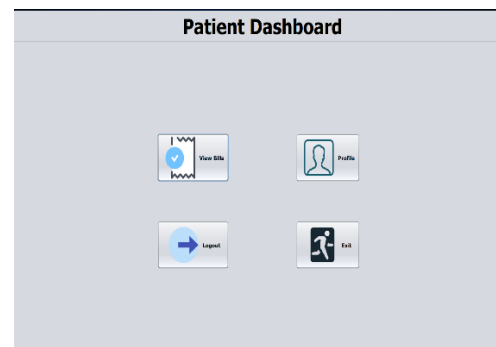
Add user page

PharmacistDashboard.java: Interface for pharmacists to manage pharmacy operations, including prescription management, medication dispensing, medication inventory, user authentication, billing and insurance processing, and GUI.



Pharmacist dashboard Page

PatientDashboard.java: Provides patients with a user-friendly interface to access health information, manage prescriptions, schedule appointments, review billing and insurance details, and receive notifications.



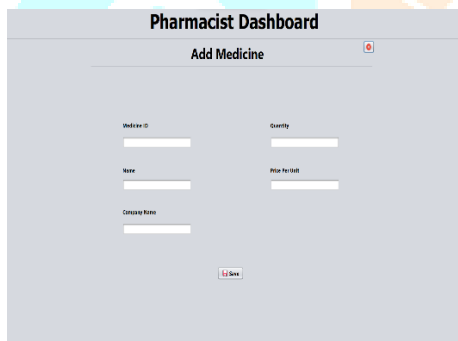
Patient Dashboard page

ViewUser.java: Displays and views user-related information and details within the system, allowing authorized personnel to access and review user profiles, roles, permissions, account activity, and contact information.



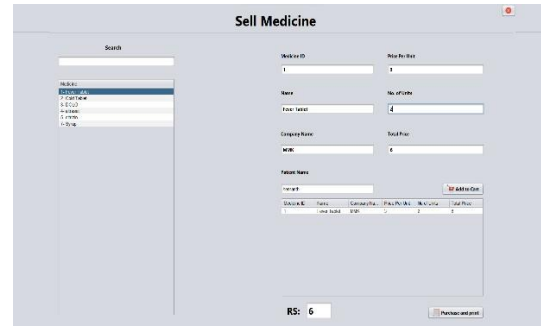
View User Page

AddMedicine.java: Allows authorized personnel to add new medicines to the medication inventory, including user authentication, UI for entering medicine details, pricing and cost information, stock management, categorization, and manufacturer/supplier details.



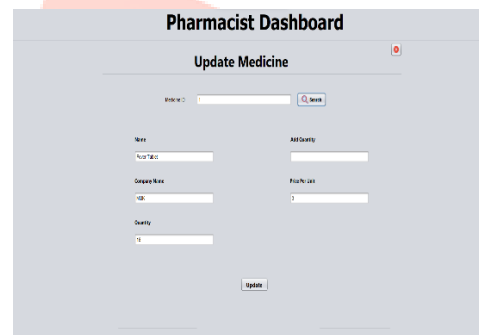
Add Medicine Page

SellMedicine.java: Handles the process of selling medicines, managing sales transactions, updating inventory, calculating prices, and ensuring compliance with regulatory requirements, including user authentication, UI for sales processing, medicine selection, quantity, price calculation, prescription verification, patient information, and billing/invoicing.



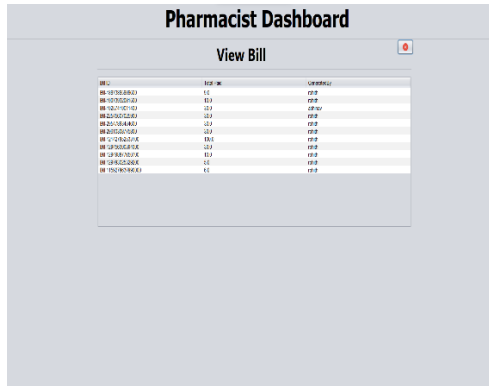
Sell Medicine Page

UpdateMedicine.java: Enables authorized personnel to update and modify information related to medicines in the medication inventory, including user authentication, medicine selection, medicine details modification, pricing and cost updates, stock management, and manufacturer/supplier information.

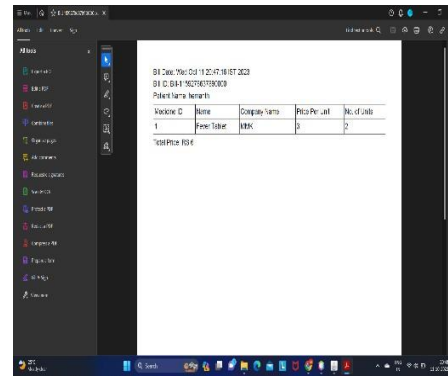


Update Medicine Page

ViewBill.java: Displays billing and invoice information to pharmacy staff, patients, or customers, including user authentication, UI for viewing bills, bill selection, bill details, patient information, billing date, print and save options, and billing history.



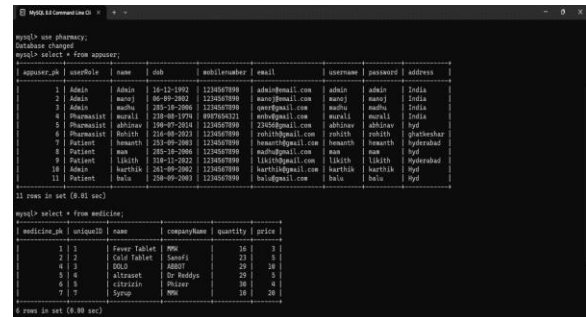
View Bill Page



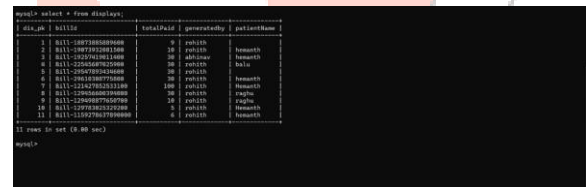
View Patient Bill

ViewPatientBill.java: Allows authorized users to view and access billing and invoice information specific to a patient's medication purchases and related services, including user authentication, UI for viewing patient bills, patient selection, bill details, billing date, payment methods, billing history, print and save options, and patient information.

Some of the pictures of the databases:



Picture of database 1



Picture of Database 2

Experimental Results:

The Project had produced commendable results. Finally, we could able to produce the bills which are generated by the pharmacist and store it in local disk. We also retrieve the bills back and make them to be displayed to

the particular patient when he logs in. We have solved the issue of the time management and alert management if the medicine count is low so that pharmacist can inform to the admin.

The final outcome of the project is:

Conclusion

These are the following findings have been observed in the project:

Electronic Pharmacy Record (EPhR): EPhR tracks patient progress, ensuring accurate and accessible health data, enhancing personalized care, and enabling effective monitoring of medication histories.

Stock Management: Automated alerts and online stock orders optimize inventory,

preventing shortages, and ensuring timely availability of medications, enhancing pharmacy efficiency.

Electronic Prescribing (E-prescribing): E-prescribing improves patient safety, enables rapid prescription processing, and reduces errors by allowing pharmacists to electronically order and send prescriptions.

Role-Based Access Control: Ensures data security by restricting user access based on roles, preventing unauthorized access and safeguarding patient information confidentiality.

Billing Management: Stores billing data for dispensed drugs with unique identifiers, streamlining billing processes and ensuring accurate financial transactions.

These are the following justifications identified in the project:

Patient Wait Time: The system can reduce wait times by optimizing the prescription processing workflow, automating tasks, and providing real-time updates to patients.

Formula: Wait Time = (Time Prescription Ready for Pickup) - (Time Prescription Requested)

Error Rate: The system can improve accuracy by implementing drug interaction checks, patient allergy alerts, and automating checks for prescription accuracy.

Formula: Error Rate = (Number of Errors) / (Total Prescriptions Processed)

Revenue per Prescription: This parameter measures the average revenue generated

from each prescription filled. By optimizing pricing strategies, offering additional services, and increasing prescription volumes, the system can improve this parameter.

Formula: Revenue per Prescription = (Total Pharmacy Revenue) / (Total Prescriptions Filled)

The Reasons for justification improvements are:

Automation: Pharmacy Management Systems automate various tasks, reducing human errors and improving the accuracy and efficiency of prescription filling and inventory management.

Integration: Integration with E-Prescription systems and electronic health records enhances communication and reduces manual data entry errors.

Alerts and Warnings: The system can issue alerts for potential drug interactions, patient allergies, or incorrect dosages, helping pharmacists catch and prevent errors.

Efficiency: Streamlining workflows and reducing paperwork saves time, enabling pharmacists to focus on patient care and reducing wait times.

References:

[1] V.P.Gladis Pushparathi, R.Aarthi, T.V.Jothi Shree, R.Usha“ Pharmacy Management System based on Spring and Hibernate “

[2] INSAF ULLAH, NOOR UL AMIN, AHMAD ALMOGREN, MUHAMMAD ASGHAR KHAN, M. IRFAN UDDIN, AND QIAOZHI HUA “A Lightweight and Secured Certificate-Based Proxy Signcryption (CB-PS) Scheme for E- Prescription Systems “

