Building a Robust Hospital Management System

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Project Overview & Core Technologies

Project Vision

Our team project aims to streamline hospital operations, enhance data integrity, and improve administrative efficiency within a comprehensive Hospital Management System. My role specifically addresses critical admin functionalities: Pharmacy Approval and Insurance Management.

Architectural Foundation: MVC

The system is built upon the **Model-View-Controller (MVC)** architectural pattern, ensuring a clear separation of concerns, modularity, and maintainability.

Key Technologies

- **Java**: Core programming language for business logic.
- **JSF (JavaServer Faces 2)**: Robust framework for the user interface.
- **Hibernate 3.6**: ORM tool for seamless database interaction.
- **MySQL**: Relational database for data persistence.
- **Log4j 3.24**: Logging utility for effective debugging and monitoring.

Module 1: Pharmacy Module

Admin Checks

As an admin, my main job is to check and approve new pharmacy sign-ups. This step makes sure all pharmacies follow our rules and standards.

Check Details

To approve a pharmacy, we check important details like their **Pharmacy Name, Aadhaar Number, GST Number,** and **License Number**. Our system automatically spots anything that doesn't meet the rules.

Automatic Emails

After we review an application, the system automatically sends an email to the pharmacy. This email tells them if they are approved or not and gives them clear next steps. It makes talking with applicants much faster.

Pharmacy Module: Data Validation Rules

Aadhaar Number Format

Mandatory format: AADHAR followed by exactly 6 digits.

Example: AADHAR123456

License Number Pattern

Must start with LIC followed by exactly 5 digits.

Example: LIC12345

GST Number Structure

Requires GSTIN prefix, then 4 digits, and 2 alphanumeric characters.

Example: GSTIN1234KP

These stringent validation rules ensure data quality and compliance, preventing erroneous or fraudulent pharmacy registrations from entering the system. Robust exception handling is integrated for all validation failures.

Pharmacy Module: Database Schema

Pharmacy Details

- **pharmacy_id**: VARCHAR(10) (Primary Key)
- **pharmacy_name**: VARCHAR(100)
- **contact_no**: VARCHAR(15)
- **email**: VARCHAR(100)
- **password**: VARCHAR(45)
- **created_at**: TIMESTAMP

Location & Status

- **state**: VARCHAR(50)
- **city**: VARCHAR(100)
- **pin_code**: VARCHAR(10)
- **address_line1**: VARCHAR(255)
- **license_no**: VARCHAR(20)
- **status**: VARCHAR(20)
- **gst_number**: VARCHAR(20)

Owner Details

- **first_name**: VARCHAR(100)
- **middle_name**: VARCHAR(100)
- **last_name**: VARCHAR(100)
- **gender**: VARCHAR(10)
- **owner_mobile**: VARCHAR(20)
- **owner_email**: VARCHAR(100)
- **aadhar**: VARCHAR(20)
- **owner_address**: VARCHAR(255)

This schema organizes critical pharmacy information, ensuring comprehensive data management for the Approval System.

Pharmacy Module: User Interface

The user interface for the Pharmacy Approval module is designed for administrators to efficiently manage registrations. It features a searchable, sortable, and paginated table view of all pharmacies, along with clear visual indicators for approval status.

Module 2: Create Insurance

Insurance Plan Structure

Admins can efficiently create and manage insurance plans, ensuring flexible coverage and adherence to regulations. This includes:

- **Plan Creation:** Admins can define new insurance plans, specifying options such as Silver, Gold, and Platinum, each with distinct benefits and coverage levels.

- **Member Types:** Plans can be configured for individual or family coverage, allowing admins to set rules for the number of members per plan.

- **Member Relations:** The system enables admins to define and manage relationships between policyholders and their family members (e.g., spouse, child), ensuring accurate coverage and claim processing.

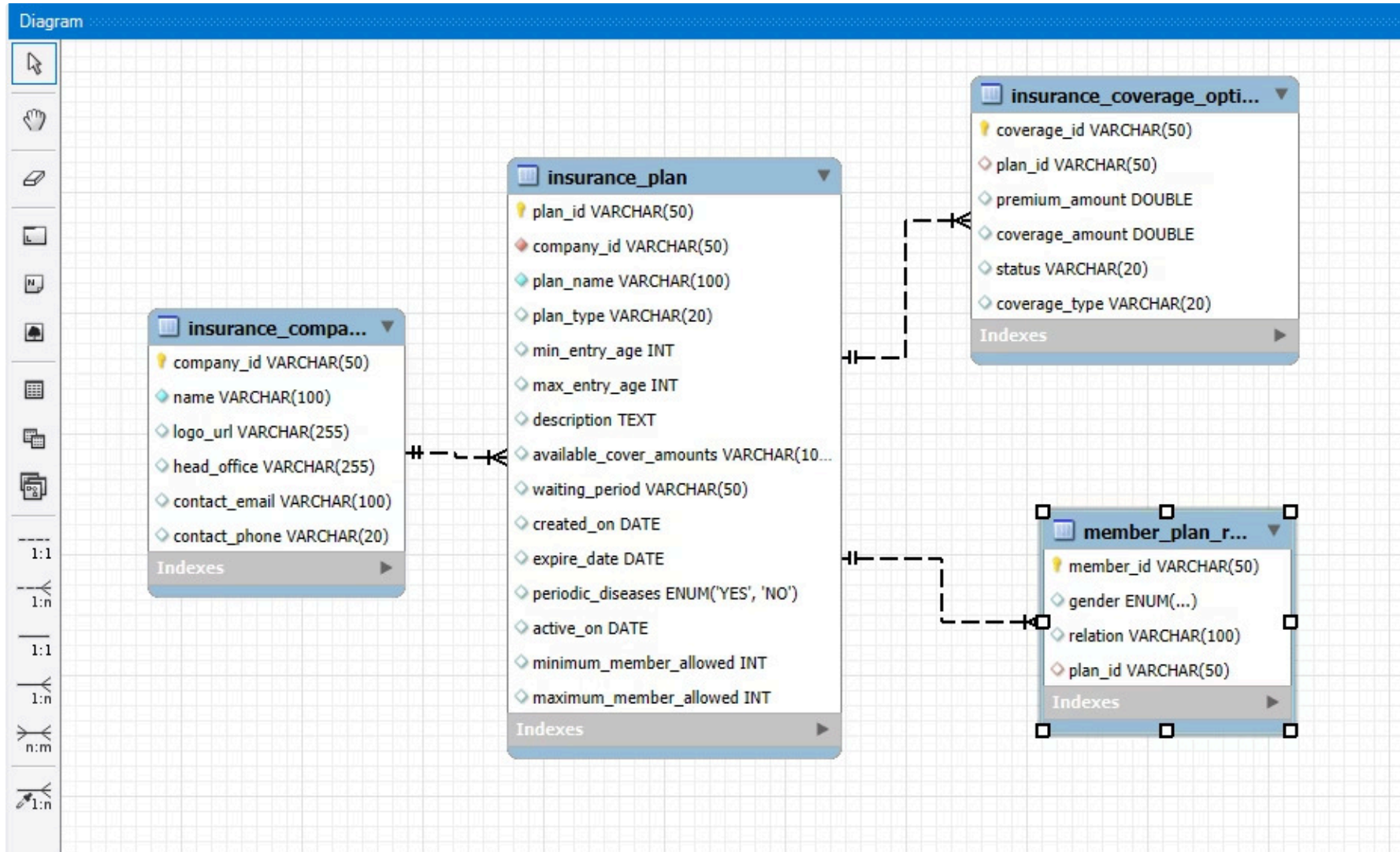## Plan Coverage options

Silver Plan	Gold Plan	Platinum Plan

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Insurance Module: Database Schema

Insurance Module: User Interface

The Insurance Management dashboard offers administrators a centralized view of all active insurance plans. Its user-friendly interface supports adding new plans, editing existing ones, and efficiently searching, sorting, and paginating through the insurance data to maintain an organized and up-to-date record of all offerings.

Conclusion: Enhancing Hospital Operations

In summary, this project successfully developed and integrated crucial administrative modules for pharmacy approval and insurance management. These advancements significantly improve daily hospital operations by streamlining key processes, reducing errors, and enhancing the overall efficiency and accuracy of healthcare services.

1 **Integrated Modules**

We successfully built important admin tools for pharmacy approvals and managing insurance plans.

2 **Easy Pharmacy Approvals**

Admins can now quickly approve new pharmacy registrations.

3 **Simple Insurance Setup**

Administrators can easily create and manage various insurance plans, making patient coverage more flexible and accurate.

4 **Smoother Hospital Work**

These new tools make hospital operations much more efficient, cut down on manual mistakes, and create a strong base for connected healthcare.