



Smart Pharmacy Management System

Category: Healthcare

Course: PL/SQL

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Project Overview

This PL/SQL-driven Smart Pharmacy system enhances medication safety and operational efficiency.

Safety & Compliance

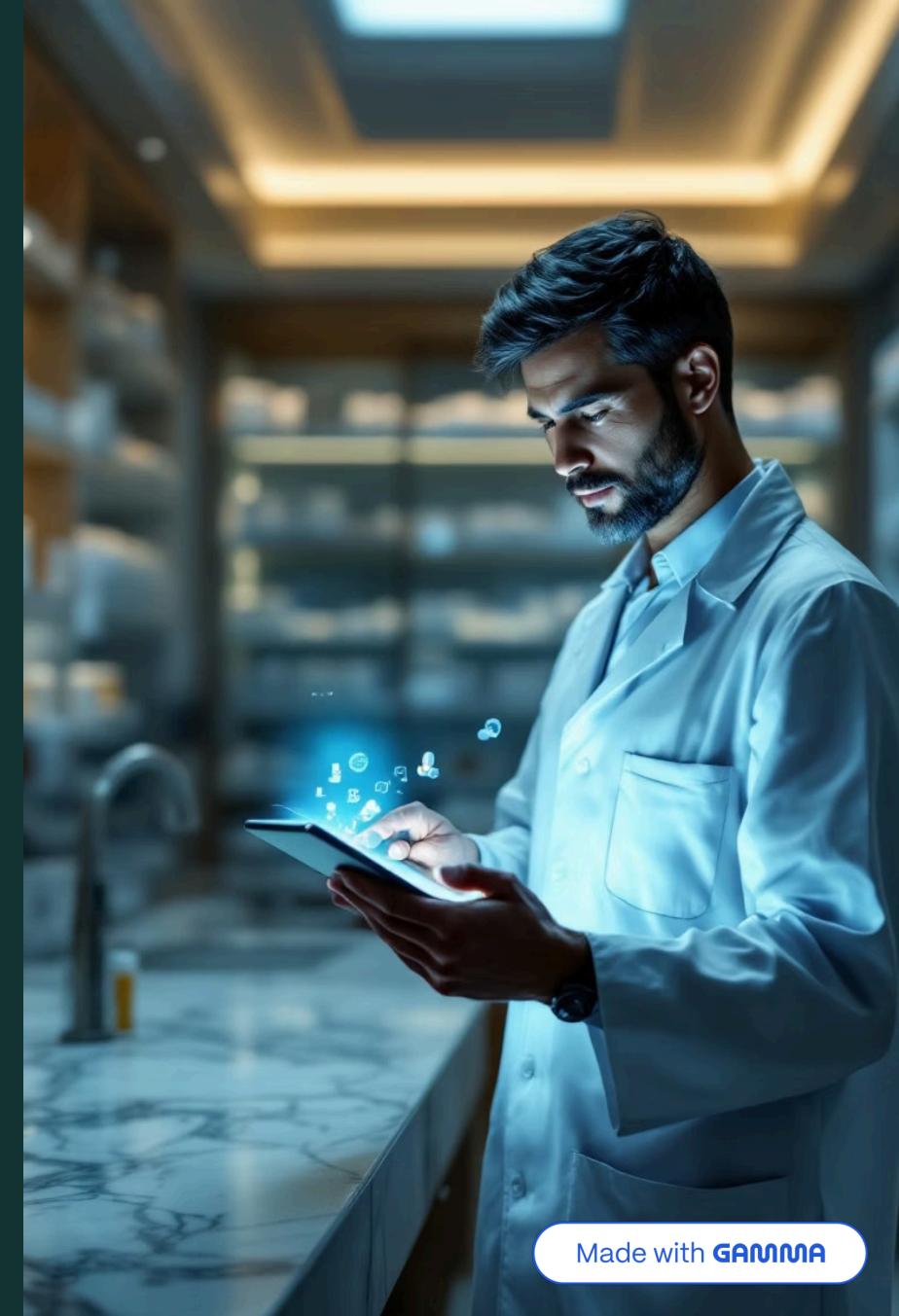
Reduces medication errors and ensures regulatory audit trails.

Inventory Management

Manages batch-level inventory with expiry dates.

Automated Checks

Checks for drug interactions and patient allergies at dispense time.



Key Objectives

1 Batch & Expiry Tracking

Track medication batches and expiry-driven inventory.

2 Prescription Validation

Validate prescriptions against allergies and drug interaction rules.

3 FIFO Dispensing

Reserve and decrement batch quantities using FIFO by expiry.

4 Automated Alerts

Generate alerts for low stock and near-expiry batches.

5 Full Audit Trail

Maintain a complete audit trail of all pharmacy actions.

Core Database Schema

The system relies on a robust database structure to manage all pharmacy operations.

- **MEDICATIONS:** Details of all drugs.
- **BATCHES:** Inventory by batch and expiry.
- **PATIENTS:** Patient demographics and allergies.
- **PRESCRIPTIONS:** Prescription details.
- **PRESCRIPTION_LINES:** Specific medications in prescriptions.
- **DRUG_INTERACTIONS:** Rules for drug safety.
- **DISPENSE_LOG:** Records of dispensed medications.
- **AUDIT_LOG:** Comprehensive activity log.
- **STOCK_ALERTS:** Notifications for inventory.



MEDICATIONS Table

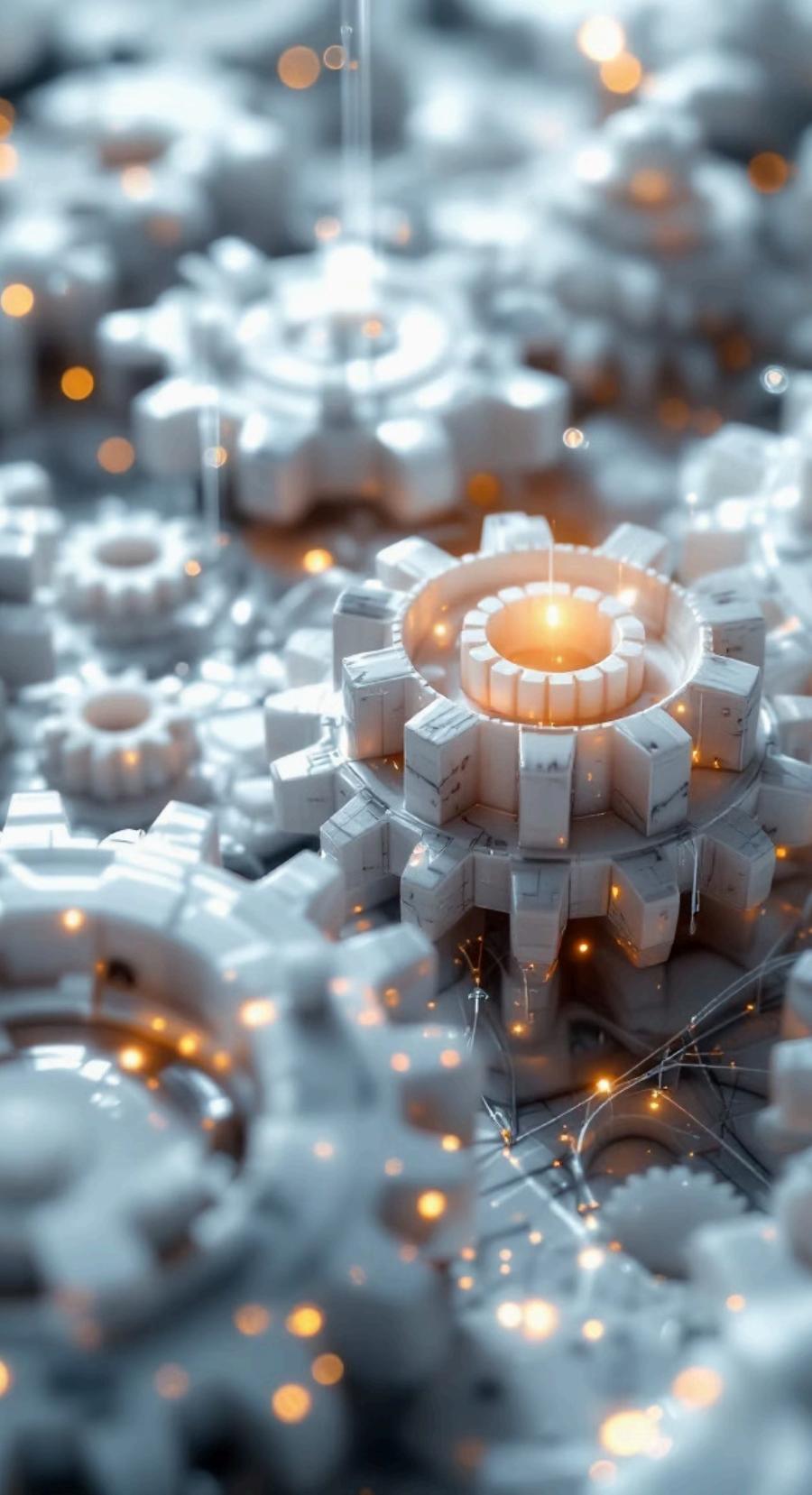
medication_id	Unique identifier	101	Primary Key
name	Brand name	Tylenol	VARCHAR2
generic_name	Generic name	Acetaminophen	VARCHAR2
requires_prescription	Prescription needed?	Y/N	BOOLEAN
active_status	Is medication active?	Active	VARCHAR2

BATCHES Table

batch_id	Unique batch ID	B001	Primary Key	
medication_id	Associated medication	101	Foreign Key	MEDICATIONS
expiry_date	Expiration date	2025-12-31	DATE	
qty_on_hand	Current quantity	150	NUMBER	
purchase_price	Cost per unit	5.75	NUMBER	

DRUG_INTERACTIONS Table

interaction_id	Unique ID	DIO01	Primary Key	
med1_id	First medication	101	Foreign Key	MEDICATIONS
med2_id	Second medication	102	Foreign Key	MEDICATIONS
severity	Interaction severity	High	VARCHAR2	
description	Interaction details	Increased drowsiness	VARCHAR2	



Innovation & Improvements

Atomic Safety Checks

In-database checks prevent bypass and ensure auditable overrides.



Batch-level FIFO

Expiry-driven FIFO allocation reduces waste and optimizes stock.



Mandatory Override Reasons

Captures reasons for overrides, supporting compliance and auditability.



Configurable Rules

Interaction rules stored in DB for easy tuning and updates.

System Impact

The Smart Pharmacy Management System significantly improves pharmacy operations and patient safety.

Reduced Errors

Minimizes medication errors through automated checks.

Clear Records

Maintains clear, auditable records of all actions.



Expiry Alerts

Prevents dispensing of expired medications.

Optimized Stock

Efficiently manages inventory and reduces waste.

Conclusion

This project demonstrates a practical and powerful solution for modern pharmacies.

The Smart Pharmacy Management System with Drug Safety Checker is a simple yet powerful solution that enhances pharmacy operations and patient safety.

It leverages PL/SQL features like triggers, procedures, functions, and exceptions to automate tasks, improving accuracy, saving time, and increasing patient safety.

This system offers a strong understanding of PL/SQL programming and provides safer, more efficient services.

