

# Smart Hospital Operations Optimization

**Parul® University**  
**NAAC GRADE A++**



# Team & Problem Statement

Team Code Blue

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Problem: Smart EHR System to streamline patient care and minimize insurance rejections

Leads to delays, rework, and financial stress.

Frequent rejections due to missing/incomplete documentation.



**MedAudit**

# AI-Powered Solution

AI-powered multi-agent system for insurance document validation and submission.

Secure NFC-based patient data access and streamlined OPD workflows.



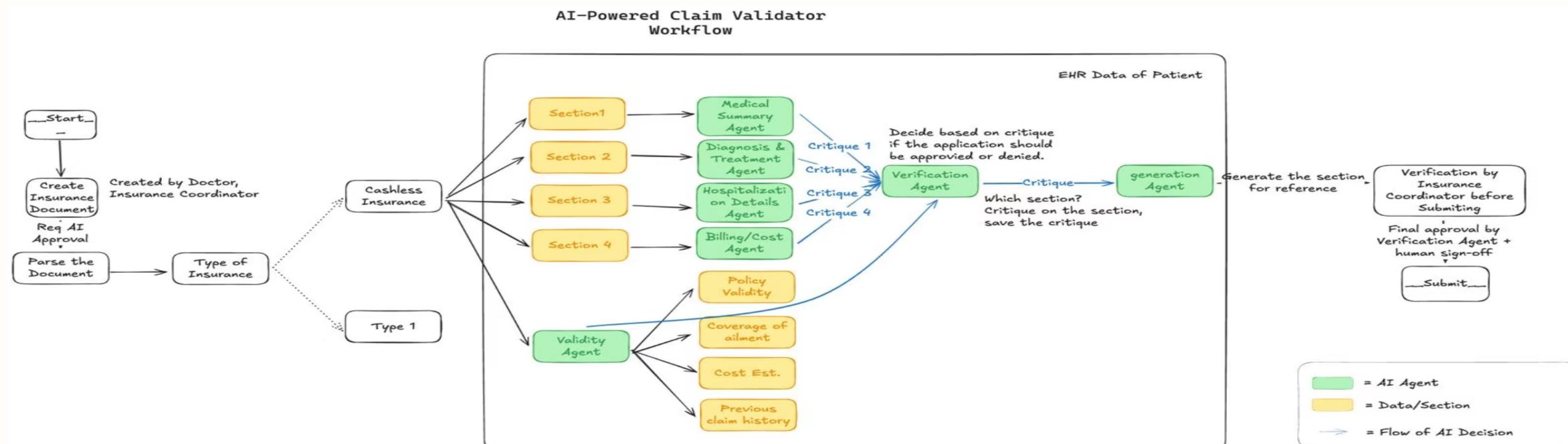
# Input & Process Flow

## Input

- OPD insurance form (doctor/coordinator)
- Patient's EHR (NFC scan/hospital system)
- Insurance policy details (database)

## Process

- NFC scan at OPD desk fetches patient EHR securely.
- Document parser identifies insurance type & splits form into key sections.
- AI Section Agents validate each form parts.
- Validity Agent matches policy terms with treatment history.
- Generation Agent suggests fixes or auto-fills missing data.
- Verification Agent prepares the finalized version for submission.



# Key Agents & Deliverables

## Key Agents

- Section Agents: Document correctness.
- Validity Agent: Policy coverage, cost, history.
- Verification Agent: Critiques, approval decision.
- Generation Agent: Suggestions, auto-fills.

## Deliverables

- Flags inconsistencies.
- Detects missing documentation.
- Predicts denial risk.
- AI-generated suggestions for approval.

## Benefits



### Minimize Errors

Reduces manual errors and workload.



### Improve Transparency

Traceability in OPD and claims.



### Reduce Rejections

AI-powered pre-validation.



### Simplify Patient Experience

NFC one-tap check-ins.



### Boost Efficiency

Integrates OPD, EHR, insurance.

# Streamlining Operations: Claims Processing

Example Scenario: 1,000 Patients / Month

Task	Traditional EHR (Time Spent)	With System (Time Spent)
• Check in	• ~ 83 hours (5 min avg)	• ~ 17 hours (1 min avg)
• Manual pre - claim review	• ~ 750 hours (45 min avg)	• ~ 83 hours (5 min avg)
• Re - submission cases (20% denied)	• ~ 300 cases * 4 hrs (~1,200 hours)	• ~ 50 cases * 0.5 hrs (~25 hours)

Total time saved: Over 1,900 hours / month

# Streamlining Operations: Claims Processing

## Without Our System



### Slow Claim Processing

Claim process is slow, error - prone, and reactive.



### Manual Staff Overload

Staff overloaded doing manual reviews and chasing denials.



### Patient Frustration & Delays

Patients frustrated with delays and missing info.



### Significant Financial Losses

Financial losses from denials and delays

## With Our System



### Rapid, Automated Claims

Claims are faster, cleaner, and proactive.



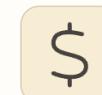
### Reduced Staff Burden

AI handles bulk of checks, staff focus on care.



### Enhanced Patient Satisfaction

Fast check-in with faster approvals resulting in happier patients.



### Minimized Financial Losses

More complete reimbursements, faster cash flow.

# Empowering Clinicians with AI



## Instant Access to Medical Histories:

Clinicians can quickly review comprehensive patient records, leading to faster and more accurate diagnoses.



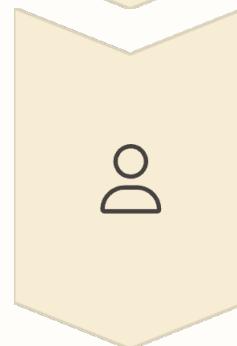
## Streamlined Appointment Management:

The system automates scheduling, reduces wait times, and enhances patient flow.



## Data-Driven Insights:

The system enables real-time analytics on patient trends and clinical performance, supporting proactive decision-making and continuous care improvement.



## Enhanced Care Coordination:

Seamless data sharing across departments ensures all healthcare providers are aligned, reducing errors and improving treatment outcomes.

# Elevating the Patient Experience

Our smart system redefines the patient journey, offering unparalleled convenience and peace of mind through integrated digital solutions.



## Instant Access

Patients securely access their full medical history and current prescriptions with a single tap, streamlining their healthcare journey.



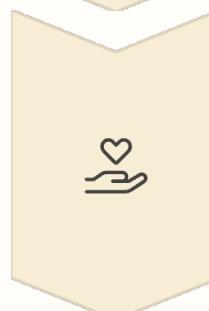
## Emergency Preparedness

NFC scanning provides critical emergency details instantly, enabling rapid and informed care, especially vital for elderly patients.



## Simplified Management

Eliminates the need for physical documents, simplifying prescription maintenance and reducing patient effort and hospital navigation.



## Enhanced Safety for Seniors

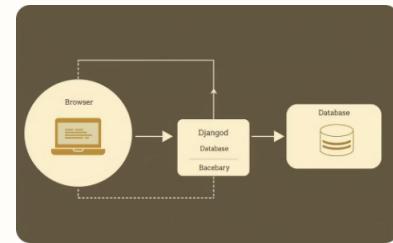
The intuitive system reduces confusion and anxiety for elderly patients by providing easy access to their health information and care plans, ensuring their well-being.

## Technology Stack



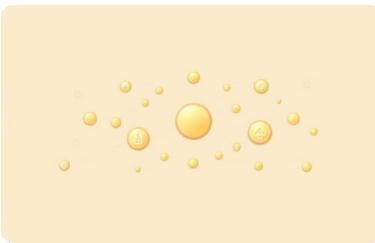
### Front-end

Next.js for dashboards and OPD interfaces.



### Back-end

Django powers the REST API and business logic.



### AI Orchestration

LangGraph manages multi-agent workflows.



### Language Models

Leverages OpenAI GPT, Claude, and LLaMA.



### Database

PostgreSQL for patient data and logs.



### Authentication

Django Allauth and JWT ensure secure login.



### NFC Integration

Web NFC API or external SDK for seamless integration.



### Hosting

Vercel for frontend, Render/Azure for backend.

# Future Outlook

This smart EHR system is poised to revolutionize patient care, leading to more efficient diagnoses and personalized treatment plans.

By leveraging AI and seamless integration, we aim for a future of highly efficient, error-free hospital operations.

