PROJECT REPORT

Project Title: Clinical Trial Patient Recruitment and Adherence Monitoring

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Company Name: Infotact Solutions

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1. Introduction

Clinical trials require efficient patient recruitment and tracking of protocol adherence across study sites. Dashboard solutions streamline workflow and improve data integrity.

2. Objectives of the Project

- Build a secure, scalable dashboard integrating multi-site EDC/EMR data.
- Visualize recruitment funnels and site KPIs.
- Provide actionable insights for trial managers.

3. Architecture & Technology

Layer	Technology	Description
Frontend	React	Dashboard Ul, visualizations, live updates
Backend	FastAPI	REST APIs, business logic, authentication
Data Pipeline	Python/ETL	Clean, anonymize, transform raw exports
Storage	CSV/DB	Stores processed trial data

4. Key Features

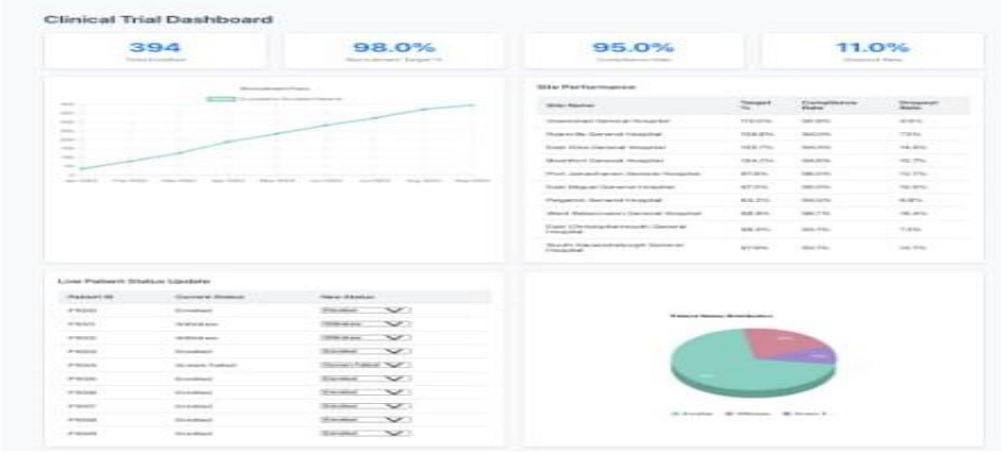
Multi-Site Data Integration:
Aggregates and standardizes exports from diverse sources.

Funnel Visualization:
Monitors screened, enrolled, and randomized patients.

Performance Leaderboard:
Tracks enrollment velocity and data quality per site.

Adherence Dashboard:
Flags at-risk patients based on metrics (missed visits, adherence %).

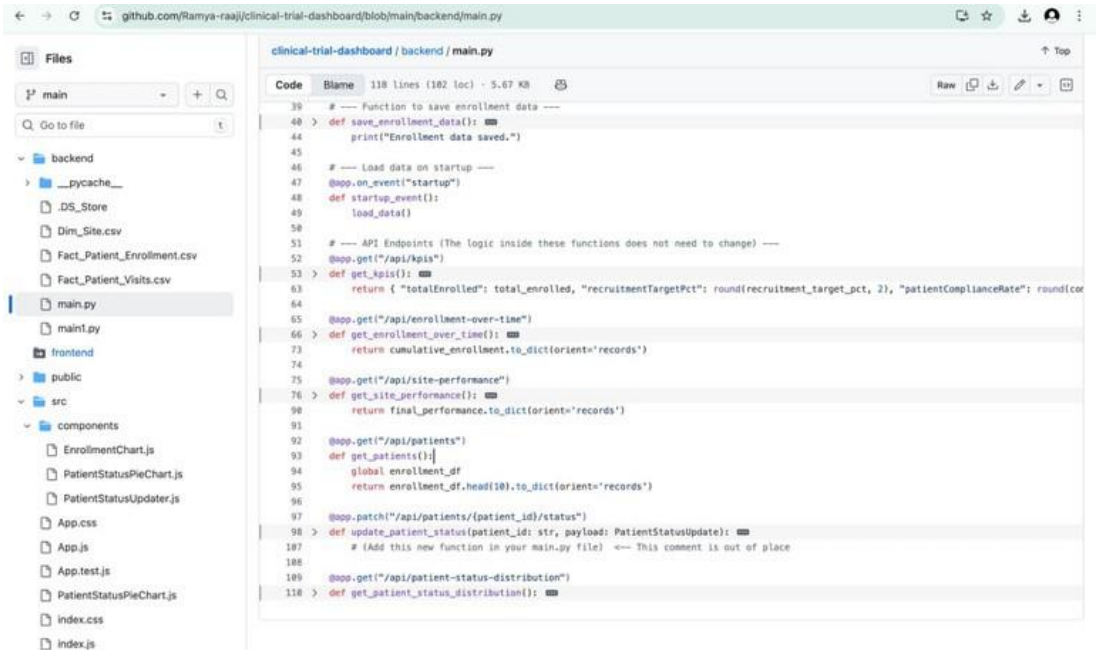
Patient Status Updater:
Enables managers to update status and see live impact.



5. Implementation Details

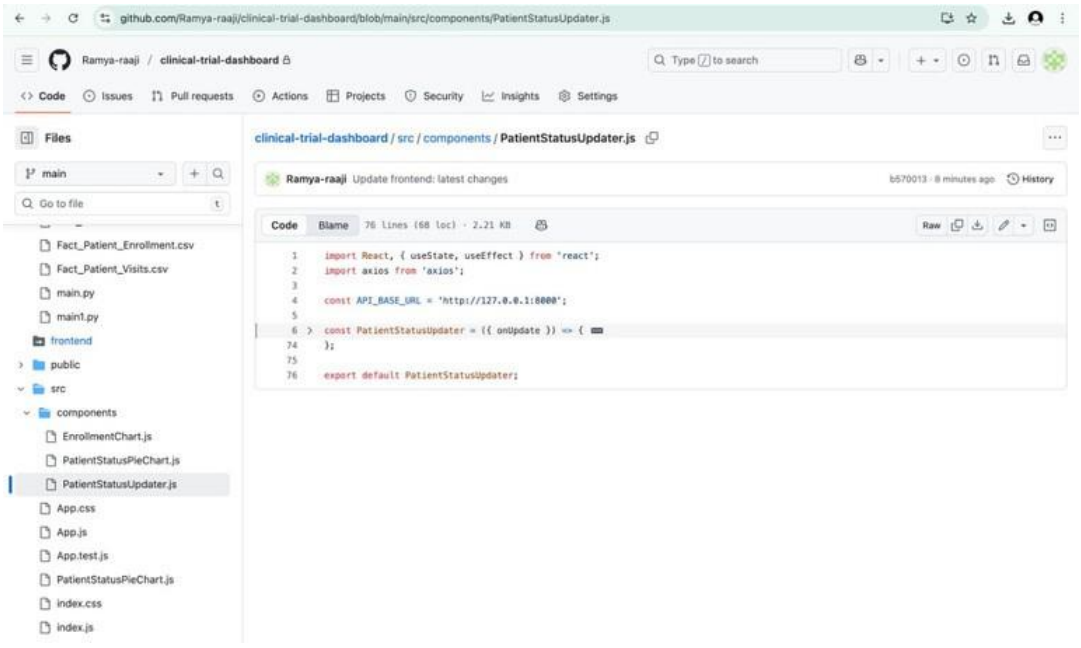
<u>Backend (FastAPI)</u>

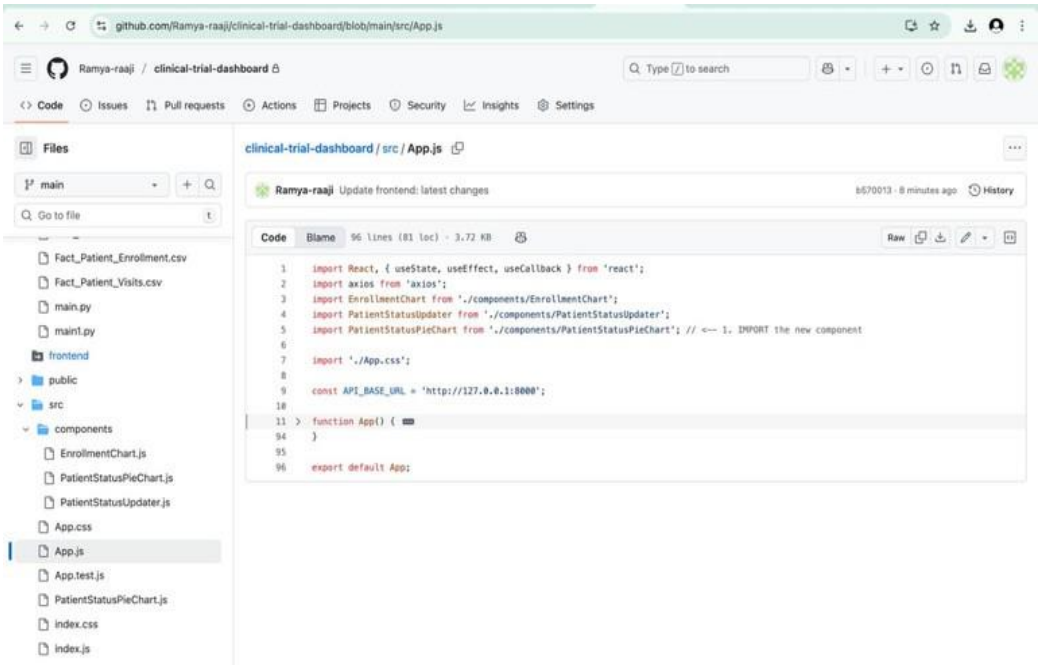
- API endpoints: patient enrollment, status distribution, update API, site leaderboards.
- Modular Python functions for ETL and transformations.
- Middleware for CORS, JWT/OAuth2 recommended for auth.

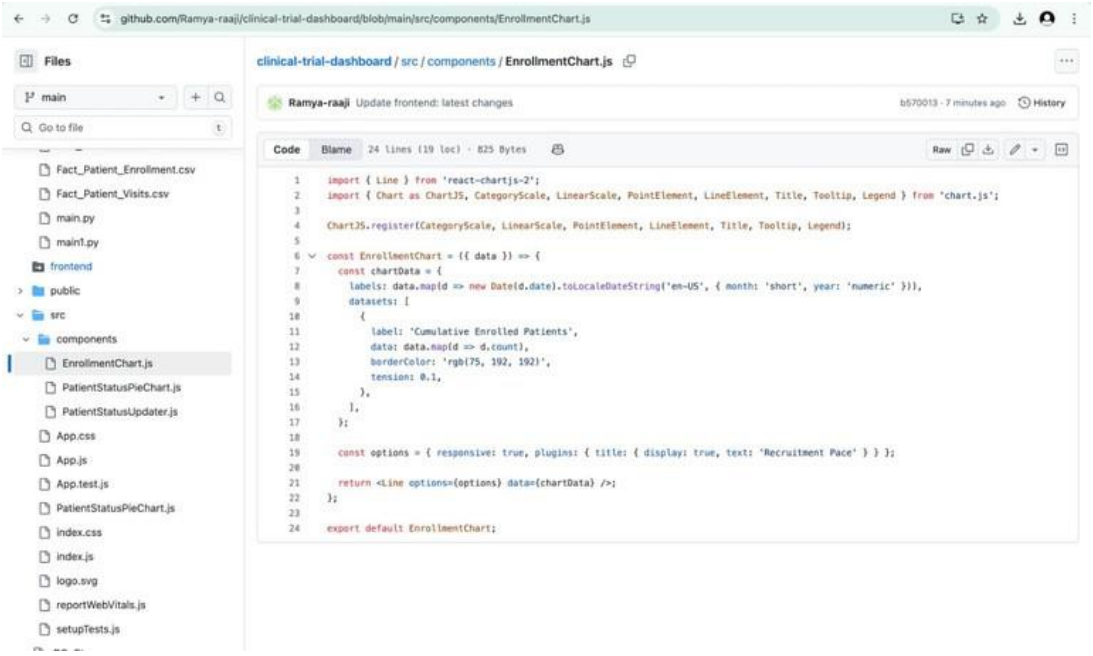


Frontend (React)

- Modular components for charts, tables, and live status updates (EnrollmentChart.js, PatientStatusPieChart.js, PatientStatusUpdater.js).
- State management for live updates.
- Integrated with backend endpoints via Axios.





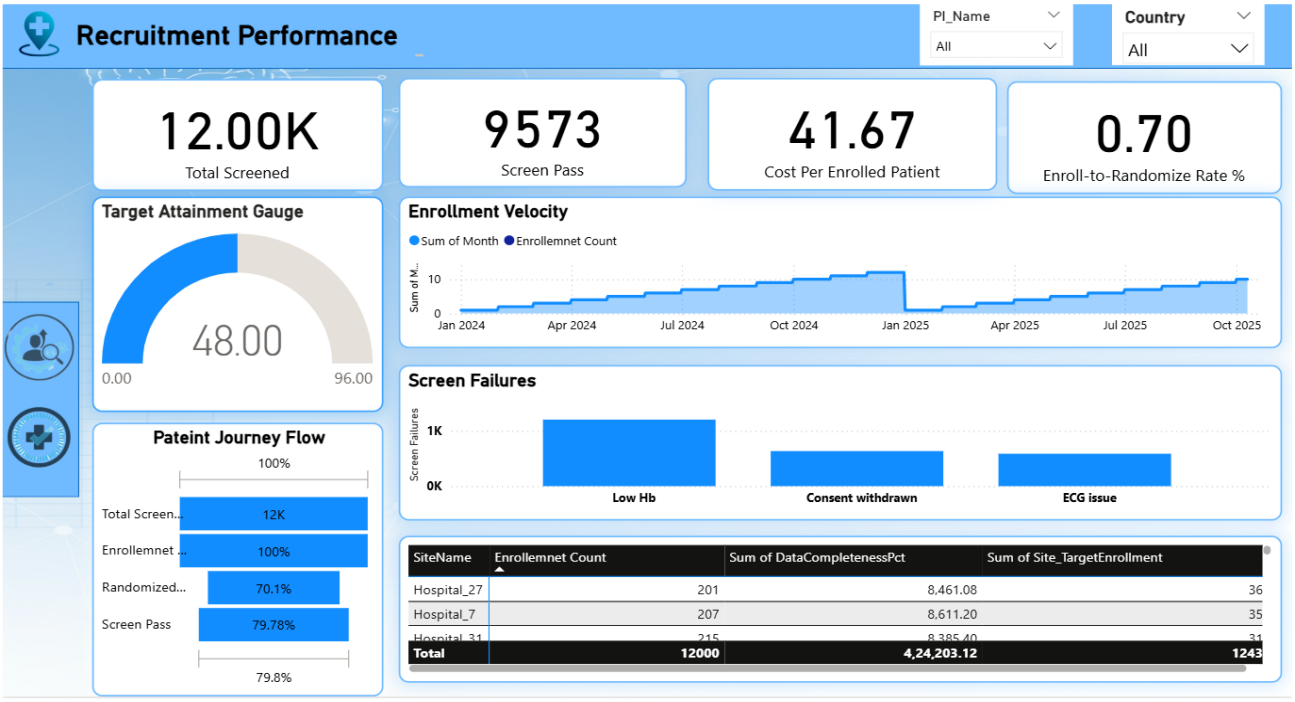


Data Model

- Star schema with fact tables (enrollment, visits, data quality) and dimension tables (site, patient, visit type).
- Sample pseudonymized CSV structures for privacy compliance.

6. Dashboard Demonstration

- Screenshot(s) of live dashboard visualizations and patient status management.
- Explanation of real-time updating mechanics and chart refresh.



7. EDA

- The exploratory data analysis of the clinical trial dataset revealed clear patterns in patient demographics, adherence scores, and adverse events.
- The data was largely clean with minimal missing values, ensuring reliability for further modeling and clinical interpretation. These insights support data-driven improvements in trial evaluation and patient outcome analysis.

8. Security & Compliance

- Data anonymization practices, PHI removal.
- Role-based access foe users/sites.
- Logging and audit trail for regulatory validation.

9. Testing and Deployment

- Unit/integration tests for backend and frontend endpoints.
- Docker containerization recommended; CI/CD, scheduled refresh for production.

10. Future Enhancements

- Integrate SMS/email alert automation for at-risk patients.
- Extend model explainability and mobile-friendly report views.

11. Conclusion

- Integrate SMS/email alert automation for at-risk patients.
- Extend model explainability and mobile-friendly report views.