DCM Infotech

CASE STUDY · LABORATORY INTELLIGENCE PLATFORM

Agentic AI laboratory intelligence platform

How a leading Indian tertiary-care hospital unified fragmented enterprise systems through an AI layer, and enabled executives and clinicians to interact with laboratory data in natural language.

Client overview

- Leading tertiary-care multi-specialty teaching hospital, North India
- Healthcare and tertiary-care hospital services
- First use case: laboratory analytics across revenue, cost, service and turnaround time
- Outcome: a validated, cost-controlled conversational AI layer across enterprise systems
- Solution by DCM Infotech Limited

Technology environment

- InterSystems TrakCare for clinical and hospital operations
- Oracle Fusion for enterprise and financial management
- Microsoft Power BI for analytics and reporting
- PostgreSQL, Python and Google LLMs

01 · OVERVIEW

Hospital data, answerable in plain English

A leading tertiary-care teaching hospital in North India had a robust enterprise ecosystem generating operational, financial and clinical data every day: InterSystems TrakCare for clinical and hospital operations, Oracle Fusion for enterprise and financial management, and Microsoft Power BI for analytics and reporting. Yet answering management-level questions remained cumbersome, and leadership was cautious about AI because of rising LLM token costs, cost scalability, governance concerns and misuse risks.

DCM Infotech built an Agentic AI-powered healthcare intelligence platform that bridged these enterprise applications, starting with laboratory analytics. The platform gives executives natural-language self-service over daily-refreshed data and surfaces previously unseen correlations across lab performance, revenue and operations, with AI operating costs kept under control.

02 · THE PROBLEM

Data was available, but not accessible

The hospital's challenge was data accessibility, not availability. Systems captured information effectively but struggled to democratize access to it:

Too many dashboards

To answer one question, users had to navigate multiple dashboards and access different reports across separate enterprise systems.

Manual analysis

Users also had to apply filters, request support from analytics teams and perform additional manual analysis before reaching an answer.

Tool fatigue

Executives did not want another dashboard, clinicians did not want another report, and department heads did not want to learn complex BI tools.

Fragmented systems

Clinical, financial and operational data resided in different systems built by different vendors, with no single unified view.

Rising LLM costs

Rising LLM token costs and uncertain cost scalability made leadership cautious about expanding AI across the enterprise.

Governance and misuse risk

Governance concerns and AI misuse risks had to be addressed before an AI layer could sit above core hospital systems.

03 · BACKGROUND

Instead of reports, leaders wanted answers

Every patient interaction, laboratory test, admission and financial transaction expands a hospital's analytical footprint. Rather than searching through dashboards, stakeholders wanted direct answers to questions such as:

- Which department generated the highest laboratory revenue this month?
- How are turnaround times trending?
- What is driving increasing laboratory costs?
- How does OPD utilization compare with IPD utilization?
- Which specialties are contributing most to laboratory growth?

The fundamental question

What if the organization could simply talk to its data?

04 · DEFINING THE VISION

A strategic exploration of enterprise AI

The laboratory domain was simply the starting point. The broader goal was to test whether an AI-driven intelligence layer could sit above fragmented hospital systems and provide one unified way to access organizational knowledge. Phase 1 was designed around two strategic objectives:

Objective 1 · Across fragmented systems

Unified integration

Validate AI integration across clinical, financial and operational data residing in different systems built by different vendors.

Key question: can AI provide a unified view of information drawn from multiple enterprise systems?

Multi-system view · Multi-vendor data

Objective 2 · In ordinary English

Conversational analytics

Enable executives and clinicians to interact with enterprise data using ordinary English instead of navigating reports.

Users would simply ask, for example: "What are the highest-cost laboratory services?"

Plain-English questions · Self-service access

The ideal proving ground for enterprise AI

Laboratories generate a unique blend of data. Few hospital departments provide such a rich combination of operational and business intelligence, which made the laboratory the right environment to evaluate an Agentic AI layer.

Financial data

Revenue, costs, margins and utilization across laboratory services and specialties.

Operational data

Volumes, productivity and capacity utilization across laboratory operations.

Service data

Turnaround times, service-level performance and patient responsiveness.

Clinical consumption data

Specialty utilization, departmental demand and testing trends.

Existing technology landscape

The mature digital infrastructure was already in place. The challenge was not replacing it, but creating a unified intelligence experience across it.

The enterprise ecosystem already in place

Clinical

InterSystems TrakCare

Clinical and hospital operations

Enterprise

Oracle Fusion

Enterprise and financial management

Analytics

Microsoft Power BI

Analytics and reporting

A hybrid architecture that uses AI selectively

A common misconception in enterprise AI is that every analytical process should be delegated to a Large Language Model. DCM Infotech deliberately avoided this, to achieve both performance and cost efficiency.

Use traditional analytics for

Calculations

Use AI for

Understanding and interpretation

Key architecture layers

Layer 1 · Centralized PostgreSQL, refreshed daily

Data layer

Service-line data consolidated into one analytical structure instead of querying production systems for every interaction.

Acts as the single source of truth for the intelligence layer.

Consistent information · Faster responses · Less production dependency · Better governance · Scalability

Layer 2 · Python

Analytics layer

Structured analytics, including all KPI calculations, run outside the LLM environment, significantly reducing AI processing costs.

Fixed-format KPIs · Standard reporting

Layer 3 · Google Large Language Models

AI layer

Introduced only where reasoning and interpretation are required.

Question understanding · Context interpretation · Natural language processing · Insight generation

Layer 4 · Conversational interface

Agent layer

Users interact not with dashboards but with an intelligent analytical assistant: the gateway into laboratory intelligence.

Ask in plain English · Self-service insight

07 · FOCUS AREAS OF ANALYSIS

Four lenses on laboratory performance

Revenue analytics

The most frequently explored area: revenue trends across specialties, helping reduce revenue leakage through healthcare financial intelligence. Example question: “How are revenue trends changing over time?”

Oncology · Nephrology · Orthopedics · Cardiology · Pulmonology · Spine · Other departments

Cost analytics

- Cost trends
- Department-level cost patterns
- Service-level economics
- Cost behavior across operations

Service analytics

- Utilization patterns
- Volume trends
- Service-load distribution
- Operational productivity

Turnaround time

- Laboratory categories
- Diagnostic functions
- IPD operations
- OPD operations

08 · MOVING BEYOND DASHBOARDS

From anticipating questions to answering any question

Traditional BI depends on knowing the question in advance. Conversational analytics lets the question lead.

Traditional BI	Conversational analytics
Reports are built in advance	Business questions change continuously
Questions are anticipated	Users ask what was never anticipated
Dashboards are designed accordingly	Teams interact naturally with data
New questions go unanswered	Instead of searching, they simply ask

09 · ADOPTION ACROSS TEAMS

One interface for every stakeholder

Executives

- Revenue
- Costs
- Service performance
- Operational trends

Department leaders

- Utilization
- Productivity
- Turnaround times

Clinicians

- Departmental performance
- Service delivery
- Operational efficiency

The conversational model proved valuable across all groups because it reduced reliance on technical reporting expertise.

10 · UNEXPECTED VALUE

Discovering hidden relationships

Because users were free to keep asking new questions, they uncovered patterns and correlations across revenue patterns, department utilization, service-level performance, turnaround times and laboratory workloads that had not been previously considered.

> **The platform became a discovery engine, not merely a reporting tool.**

11 · TURNAROUND TIME

TAT is now a patient experience metric

Historically an operational metric, turnaround time is now a strategic objective. Patient expectations continue rising, and social media, online reviews and healthcare rating platforms can make service issues publicly visible almost immediately. Delays in laboratory processing can impact:

Patient satisfaction

Physician experience

Hospital reputation

Clinical decision-making

12 · RESULTS

What Phase 1 delivered

The intelligence layer delivered measurable results across integration, accessibility and cost control.

3

Enterprise systems unified

TrakCare, Oracle Fusion and Power BI behind one interface

4

Analytical lenses

Revenue, cost, service and turnaround time, in plain English

Daily

Data refresh

Centralized PostgreSQL repository as the single source of truth

13 · STRATEGIC OUTCOMES

Five meaningful outcomes

Successful multi-system integration

An AI layer operated above multiple enterprise applications while providing a unified analytical experience.

Democratized, accessible information

Users obtained insights in ordinary English instead of navigating multiple reports and dashboards, focusing on questions rather than tools.

Cost-controlled AI deployment

Separating analytical processing (Python) from language reasoning (LLMs) kept AI operating costs under control and sustainable at scale.

Discovery of new insights

Management gained visibility into patterns and relationships previously hidden in siloed reporting environments.

Strategic validation

Most importantly, the project confirmed the viability of an enterprise AI layer within a complex hospital ecosystem, adding value on top of existing technology investments rather than replacing them.

14 · CONCLUSION

For this hospital, AI began with intelligence

For many healthcare organizations, the AI conversation begins with automation. Phase 1 was foundational by design and focused solely on proving the intelligence layer itself. The agent was not intended to do the following; those objectives belong to future phases:

✕ Replace hospital applications	✕ Automate laboratory operations	✕ Recommend actions	✕ Make decisions

The Phase 1 question

Can an AI layer unify information scattered across multiple hospital systems and make it accessible through natural human conversations?

Answer: **Yes, and without uncontrolled costs.**

The most significant outcome was cultural

~~"Where is the report?"~~ → **"What can we learn from the data?"**

The outcome in brief

Information was abundant. Intelligence remained fragmented. Phase 1 made it accessible through conversation.

THE TAKEAWAY

The future of healthcare analytics may be a conversation. Phase 1 is the first step toward a unified Agentic AI intelligence layer for decision-making across the entire hospital enterprise.

www.dcminfotech.com | sales@dcminfotech.com