DCM Infotech

CASE STUDY · AI-POWERED TRF AUTOMATION

Building a technology-first diagnostic enterprise

How AI-powered TRF automation enabled scalable growth for a new-age diagnostic network

~500
TRFs per day at the start of the journey

5
Functional layers, from ingestion to API distribution

6
Implementation phases, from data assessment to scale

Integration is API-first: validated TRF data flows into LIMS, registration and billing.

01 · EXECUTIVE SUMMARY

TRF processing, not laboratory capacity, was the real limit on growth

When an established pharmaceutical leader decided to enter India's highly competitive diagnostics industry, it faced a very different challenge from traditional diagnostic chains. The leadership team recognised that diagnostic growth would eventually be constrained not by laboratory capacity but by the ability to rapidly process Test Requisition Forms (TRFs) across an expanding network of collection centres, franchise partners and laboratories.

To address this challenge, the organisation implemented an AI-powered TRF automation solution built on the dcm-trf.ai framework. The solution automated the extraction of information from physician-generated TRFs, validated the extracted data through structured review workflows, and integrated the information directly into downstream systems via APIs. The result was not merely an automation initiative. It became a foundational building block in the company's technology-led growth strategy.

02 · INTRODUCTION

A new diagnostics business planned for rapid, network-wide growth

- A major Indian pharmaceutical company launched its diagnostics business in 2021 as part of a broader vision of creating an integrated healthcare ecosystem.
- The company invested in a state-of-the-art National Reference Laboratory.
- It planned rapid network growth, franchise expansion, regional laboratories, extensive collection centre coverage and a technology-enabled service model.

Without automation, every growth milestone would require

- Additional operators
- Additional supervisors
- Additional training
- Additional quality controls
- Additional operational costs

03 · A DIFFERENT KIND OF AUTOMATION PROJECT

The principal sponsor was the Information Technology organisation

Why technology became the strategic differentiator

Competing purely on brand recognition would be difficult. Competing purely on pricing would be unsustainable. Instead, the organisation chose to leverage technology as a strategic differentiator. From the beginning, leadership viewed technology as an organisational capability rather than a supporting utility.

The IT team viewed TRF automation through an enterprise architecture lens, and wanted to ensure:

- Standardised data capture
- Scalable architecture
- Application interoperability
- Clean API integrations
- Future extensibility
- High data quality
- Minimal technical debt

If the business grows 10 times over the next few years, will TRF processing become a bottleneck?

04 · WORKFLOW CHALLENGES

Manual TRF entry tied transaction growth to workforce growth

Productivity constraints
Operator productivity varied significantly depending on experience, complexity of forms, volume spikes and shift staffing levels.

Data consistency
Different operators could interpret fields differently.

Training dependency
New employees required substantial training before becoming productive.

Growth limitations
Transaction growth required proportional workforce growth.

Application duplication
Data often needed to be entered in multiple systems.

05 · PROOF-OF-CONCEPT EVALUATION

Six questions decided the proof of concept

Data extraction accuracy
Could the platform accurately extract information from different TRF formats?

Flexibility
Could the system support changing business requirements?

Integration capability
Could extracted information flow into downstream systems without manual intervention?

Security
Could the solution operate within enterprise governance standards?

Scalability
Could the architecture handle significant future growth?

API readiness
Could the platform seamlessly integrate with LIMS and adjacent applications?

06 · SOLUTION ARCHITECTURE

Five layers take a TRF from scan to downstream systems

1	Layer 1 **Document ingestion**	TRFs entered the platform through scanning or digital upload.
2	Layer 2 **Intelligent extraction**	AI models extracted patient demographics, physician details, prescribed tests, clinical references and administrative fields.
3	Layer 3 **Structuring**	The extracted information was converted into a normalised format suitable for validation.
4	Layer 4 **Human validation**	Business users reviewed and confirmed extracted data.
5	Layer 5 **API-based distribution**	Validated information was automatically transmitted into downstream systems.

07 · EXCEL VALIDATION LAYER

Review in Excel stopped incorrect data reaching operational systems

Transparency
Users could clearly see the extracted data.

Auditability
Validation activities could be tracked.

Faster user acceptance
Users could review information before submission.

Reduced risk
Incorrect data could be identified before reaching operational systems.

Easier troubleshooting
Exceptions could be isolated and analysed quickly.

08 · IMPLEMENTATION JOURNEY

Six phases, from data assessment to network-wide scale

Phase 1

Data assessment

Various TRF formats were analysed. Common data fields were identified.

Phase 2

AI training

The extraction framework was tuned to diagnostic workflows.

Phase 3

Validation workflows

Business users participated in validation design.

Phase 4

API integration

Connections were established with enterprise systems.

Phase 5

Controlled rollout

Sites were onboarded gradually.

Phase 6

Scale expansion

Usage expanded across the network.

09 · STRATEGIC OUTCOMES

Volumes grew without registration bottlenecks or rising costs

Greater agility

New locations could be onboarded faster.

Consistent processes

Standard workflows reduced operational variation.

Better user experience

Operators spent less time on repetitive tasks.

Lower growth friction

Transaction increases did not create registration bottlenecks.

Faster expansion

The business could scale confidently.

Improved economics

Operational costs remained controlled despite increasing volumes.

10 · CONCLUSION

The greatest value of AI lay in removing operational friction

Beginning with approximately 500 TRFs per day, the organisation established a scalable platform capable of supporting dramatic business growth without proportional increases in manpower. Most importantly, the project demonstrated that in high-growth healthcare environments, the greatest value of AI often lies not in replacing people but in removing operational friction.