DCM Infotech

CASE STUDY

Transforming free-form prescription interpretation

Into a scalable digital registration process for a high-volume diagnostic network

01 · EXECUTIVE SUMMARY

Executive summary

This case study examines how a large South Indian diagnostic network addressed a unique operational challenge: converting handwritten doctor prescriptions into laboratory registrations at scale without creating dependency on scarce, experienced reception staff.

To solve this problem, a solution built on the dcm-trf.ai framework was implemented using Google Flash 3.7 as the underlying Large Language Model (LLM). The solution combined handwriting interpretation, medical-context understanding, test-code mapping, API-based LIMS integration, and a human-in-the-loop validation framework. The result was a highly scalable registration process that achieved over 88.0% extraction accuracy during the initial rollout and significantly reduced registration workload while preserving medical governance and operational control.

02 · BUSINESS CONTEXT

The business context

- Patients typically arrived carrying a doctor's prescription rather than a formally structured diagnostic request form.
- Across the network, daily walk-in volumes exceeded 15,000 patients.
- Scaling registrations required scaling skilled manpower.

These staff members did far more than simple data entry. They routinely:

- Interpreted handwritten prescriptions
- Identified patient demographic information
- Determined prescribed laboratory tests
- Registered patients in the LIMS system

03 · OPERATIONAL CHALLENGES

Operational challenges

Unstructured documents

There was no standard prescription format. Every prescription required contextual interpretation.

Difficult handwriting

A significant percentage of prescriptions were generated from remote and semi-urban locations. Traditional OCR technologies performed poorly in such environments.

Distinguishing tests from other information

The system needed to determine precisely which items represented diagnostic tests.

Internal test code mapping

Doctors frequently describe tests differently. Internally, these may map to a single test code.

Maintaining clinical safety

High confidence was necessary. Blind automation was unacceptable.

04 · SOLUTION OVERVIEW

Solution overview

Step 1

Prescription digitisation

The registration executive scans or uploads the doctor’s prescription.

Step 2

Intelligent prescription interpretation

The model then separated actionable information from contextual information.

Step 3

Demographic identification

Low-confidence elements were flagged for review.

Step 4

Medical context understanding

As a result, the system reduced false identification of medicines or symptoms as tests.

Step 5

Intelligent test mapping

The AI therefore translated clinical descriptions into operational transactions.

Step 6

Human-in-the-loop governance

The model therefore operated as an augmentation layer rather than an uncontrolled automation engine.

05 · BUSINESS IMPACT

Business impact

Faster patient movement

Reducing processing time at the counter improved patient movement and overall experience.

Better workforce utilisation

Experienced staff could focus on exception handling rather than routine transcription.

Attrition risk mitigation

Staff turnover previously created operational stress because specialised prescription-reading skills were difficult to replace. AI assistance reduced this dependency.

Standardisation

The solution promoted greater registration consistency across locations.

Foundation for growth

The registration function could now grow faster than manpower.

06 · WHY TRADITIONAL APPROACHES FAILED

Why traditional approaches failed

The organisation evaluated several conventional alternatives.

Manual scaling

More importantly, increasing staff linearly with patient growth was economically unsustainable.

Template-based OCR

Doctor prescriptions lacked standardisation. Therefore such solutions delivered poor accuracy.

Conventional OCR engines

Extracting words correctly does not guarantee understanding their clinical intent.

Rules-based systems

A rules-driven architecture would require continuous maintenance.

> **The objective was not merely to digitise prescriptions. The objective was to replicate the reasoning process of an experienced registration executive.**

07 · IMPLEMENTATION CHALLENGES

Implementation challenges

Scan quality

Not all prescriptions were scanned under ideal conditions. These factors significantly affected extraction quality.

Writing variability

No two doctors wrote identically. The model therefore required broad exposure to prescription diversity.

Medical vocabulary

A large dictionary of laboratory terminology, abbreviations, clinical shorthand and regional variations had to be incorporated into the framework.

Continuous learning

Operator corrections became valuable training signals. This gradually improved overall performance.

08 · MEASURED RESULTS

Measured results

88.0%

overall extraction accuracy, initial rollout

20.0%

of prescriptions required rejection or manual intervention, initial rollout

15,000

Across the network, daily walk-in volumes exceeded 15,000 patients.

Flash 3.7

Google Flash 3.7 as the underlying Large Language Model (LLM)

Exception handling

Importantly, the system correctly rejected uncertain cases rather than generating unsafe outputs.

Registration productivity

Operators could focus on validation rather than transcription.

Reduced dependency on expertise

The new approach enabled less experienced personnel to achieve higher throughput because the AI performed much of the interpretation work.

Improved scalability

The organisation could now envision expanding patient volumes without proportionately increasing registration teams.

09 · TECHNOLOGY LESSONS

Technology lessons

AI must understand context

Reading words is not enough. Healthcare workflows require understanding meaning.

Human oversight remains essential

The human-in-the-loop approach increased adoption because operators trusted the system.

Data quality matters

The majority of rejected documents were associated with image-quality issues.

Domain knowledge drives accuracy

The test-code mapping framework became a key differentiator because it translated medical language into operational actions.

10 · CONCLUSION

For diagnostic networks seeking to expand across geographically diverse regions while maintaining service quality, this case demonstrates that the real value of AI is not simply automation. It is the ability to capture years of human expertise, operationalise it, and make it available consistently across the enterprise.

