White Paper

RLDatix

Advancing NHS Legacy Information Management

A Maturity Model Approach for the Cloud-Native Era

Executive Summary

NHS Trusts and health systems are under increasing pressure to modernise legacy information management, ensuring compliance, interoperability, and readiness for AI-driven healthcare. This white paper presents a staged maturity model, adapted for the NHS, to guide organisations from fragmented, rigid legacy data practices to intelligent, cloud-native information management.

Introduction

Legacy information systems - often siloed, reliant on static repositories, or dependent on complex, on-premise architectures - pose significant risks to NHS organisations. These include compliance gaps, inefficiencies, and barriers to digital transformation. The NHS-specific Legacy Information Management Maturity Model (NHS-LIMM) provides a clear roadmap for Trusts to evolve their practices.

The NHS Legacy Information Management Maturity Model (NHS-LIMM)

Stages of Maturity

Stage	Name	Defining Characteristics (NHS Context)
1	Ad Hoc	No formal archiving program; legacy systems retained indefinitely; unstructured data (e.g., scanned notes); not accessible for digital health or AI.
2	Tactical	Basic retention for legal (NHS) requirements; minimal metadata; manual access; not integrated with EPR; not usable by digital platforms.
3	Managed	Centralised archiving with governance; role-based access; data normalisation (e.g., SNOMED, HL7); partial integration with NHS digital workflows.
4	Strategic	Archived data leveraged for clinical, operational, and legal use; feeds NHS dashboards; APIs for integration; procurement includes interoperability.
5	Intelligent	Archives are AI-ready; data used for advanced analytics, predictive modelling, and digital twins; supports real-time smart care and research.

Domains and Components

Domain	Ad Hoc	Tactical	Managed	Strategic	Intelligent
Governance and Lifecycle Risk Management	No policies; high risk	Basic retention; limited decommissioning	Formal governance; audit logs	Dynamic policy enforcement; real-time dashboards	AI-driven governance; predictive risk modelling
Infrastructure and Interoperability	Flat files; not linked	Proprietary system; limited search; isolated from clinical systems	Structured, searchable; partial EPR linkage	FHIR/ HL7 APIs; seamless integration with digital platforms	Embedded in NHS data fabric; NLP / ML enrichment; real-time interoperability
Data Utility and Smart Care Enablement	Not used for care	Manual audits only; slow access	Supports reporting and pilots; some workflow integration	Used in decision support and virtual care; real-time data feeds	Trains AI/ ML; supports autonomous tools; enables continuous improvement

Advancement Criteria

Ad Hoc → Tactical:

Inventory legacy systems; implement basic archive for legal retention; begin standardising key data (e.g., discharge summaries).

Tactical → Managed:

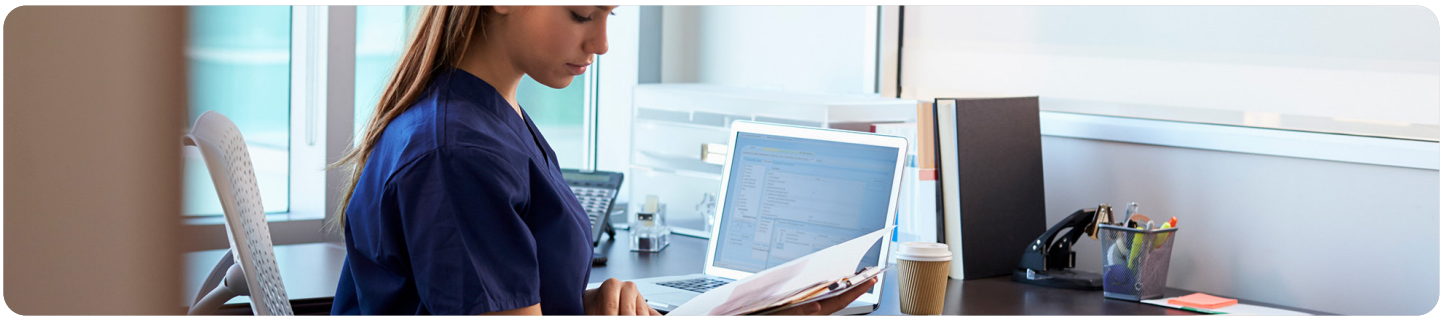
Deploy centralised, cloud-ready archive with role-based access; normalise data for interoperability; develop access policies for digital/ virtual care.

Managed → Strategic:

Enforce access controls; integrate archives into clinical workflows via APIs; ensure queries return patient-centric histories in real time.

Strategic → Intelligent:

Enrich data with AI tools; enable NLP-based search; link archives to analytics and clinical systems; support real-time AI-powered decision support and research.



Implementation Roadmap

Assess

Benchmark current state against NHS-LIMM; inventory systems, workflows, and data sources; rate maturity by domain.

Align

Define strategic outcomes (safety, experience, compliance); secure executive sponsorship; set governance.

Architect

Design interoperable, cloud-native data layers; define APIs with EPR/ERP/CRM; select platforms supporting AI-readiness and rapid integration.

Automate

Digitise manual workflows; implement SaaS-native archiving and policy systems; establish real-time data pipelines.

Analyse

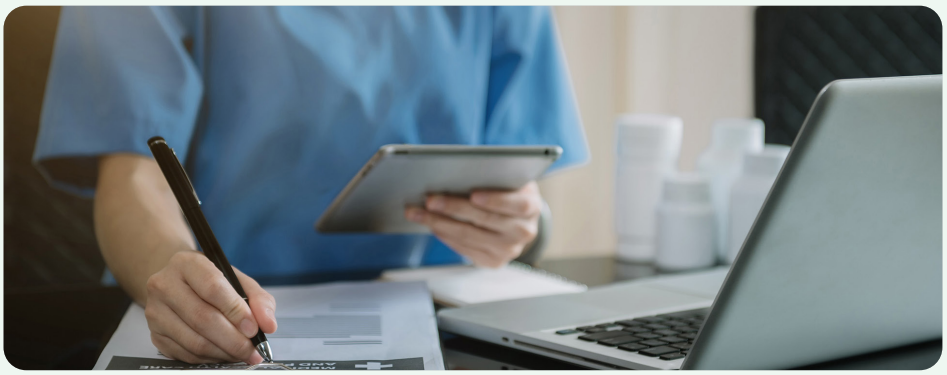
Introduce descriptive to predictive analytics; deploy dashboards; manage against leading indicators.

Orchestrate

Adopt AI-driven workflows (e.g., autonomous data enrichment, dynamic governance).

Sustain

Embed continuous improvement; measure ROI; expand governance to include ethics, bias, and model risk management.



Key metrics and ROI

Time to Data Retrieval:

↓ Average time to locate and access archived patient records or legacy clinical documents (measured in minutes/hours per request).

Data Migration Success Rate:

↑ Percentage of legacy data successfully migrated, normalised, and made accessible in the new archive (target: >99.5%).

Reduction in Legacy System Maintenance Costs:

↓ Annual spend on maintaining, patching, and supporting legacy systems (target: 70–90% reduction post-archive migration).

Compliance Audit Pass Rate:

↑ Number of successful audits with zero findings related to data retention, access, or destruction.

User Satisfaction with Archive Access:

↑ Clinician and HIM staff satisfaction scores for ease of finding and using archived data (measured via periodic surveys).

Support Ticket Volume for Data Access Issues:

↓ Number of IT/helpdesk tickets related to legacy data retrieval or archive access.

Time to Fulfill Subject Access Requests (SARs):

↓ Average turnaround time for responding to patient or legal requests for historical data (target: within statutory deadlines).

Data Quality Improvement:

↑ Percentage of archived records with complete metadata, standardised formats, and error-free migration.

Enablement of Smart Care/AI Initiatives:

↑ Number of digital/AI projects (e.g., predictive analytics, digital twins) leveraging archived data as a foundation.

Decommissioned Systems Count:

↑ Number of legacy applications/silos fully retired as a result of successful data archiving.

Governance and Responsible AI

Establish a cross-functional governance council covering data quality, privacy, safety, equity, and AI model risk. Adopt bias testing, human-in-the-loop review for high-impact decisions, and transparent audit trails. Align policies with NHS regulatory frameworks and embed continuous monitoring into operational dashboards.

How to Use This Model

- Use NHS-LIMM to benchmark your Trust's current state.
- Sequence change from digitising core workflows to embedding predictive analytics and, ultimately, orchestrating AI-driven, autonomous processes.
- Align leadership on target outcomes and maturity goals.
- Reassess quarterly, celebrate advancements, and reinvest where leading indicators show the most leverage.

Conclusion

By adopting the NHS Legacy Information Management Maturity Model and prioritising agile, cloud-native solutions, NHS Trusts and health systems can systematically transform legacy data practices, supporting safer, more efficient, and AI-enabled care. This journey is not only about compliance. It's about building an operational "nervous system" that senses early, learns continuously, and delivers the right action at the right time.