

THE FUTURE OF ENTERPRISE ARCHITECTURE AND AI IN THE NHS

Dan Conner and Ian de la Mare from Atos explore how infrastructure, digital programmes and intelligent systems can improve patient outcomes

The NHS is entering a defining period of change: the 10-year health plan, the New Hospital Programme, and Hospital 2.0 set out an ambitious vision for a modern, digitally enabled health service. The challenge now is delivering these initiatives consistently, efficiently and securely across a complex system. Investment is flowing into hospital infrastructure, digital platforms and new care models, while AI adoption is accelerating. Yet transformation at this scale cannot succeed through technology alone. Without a unifying framework, initiatives risk becoming fragmented, reducing impact and increasing cybersecurity and data sovereignty concerns. Enterprise Architecture (EA) aligns business goals, technology, processes and data, providing the discipline to address this challenge. It connects strategic priorities with delivery, so that infrastructure, digital systems, and clinical pathways evolve as one integrated system. Through standardised data, ontologies and AI models, EA creates a safe foundation for innovation at scale.

Moving beyond projects to system-wide design

Healthcare transformation has traditionally been delivered through discrete programmes focused on individual systems or organisations. While these can deliver improvements, they rarely achieve sustained system-wide benefits. EA shifts the focus from

isolated delivery to coordinated system design, helping organisations see healthcare as an interconnected ecosystem. It aligns infrastructure, digital capabilities and clinical models from the outset, embeds repeatable patterns across settings and makes interoperability a practical enabler of patient-centred care. Governance becomes a continuous capability that maintains standards while allowing local adaptation.

By creating the foundations for new digital care models, EA gives innovation a governed route to scale and helps prevent AI initiatives from remaining stuck in proof-of-concept cycles. Emerging agentic AI capabilities, which can autonomously coordinate tasks and workflows, are most effective when deployed within that architectural framework.

The role of Enterprise Architecture in Hospital 2.0

Hospital 2.0 represents a step change in how healthcare facilities are designed and delivered. It combines standardised physical infrastructure with digitally enabled care models, aiming to improve productivity, reduce variation and enhance patient experience.

However, the success of this approach depends on more than construction. The digital and operational elements of each hospital must be designed with

the same level of consistency and integration as the physical estate.

EA is central to this. It defines the digital backbone for clinical systems, data platforms and integration, while mapping patient pathways to reduce inefficiency and improve flow. It also enables a repeatable delivery model so each new hospital benefits from lessons learned elsewhere, reducing risk and accelerating implementation. In this way, Hospital 2.0 becomes more than a building programme. It becomes a scalable model for delivering integrated, digitally enabled healthcare.

Where AI fits: augment, automate, and optimise

AI represents a powerful opportunity to enhance productivity and improve patient outcomes, but its value is realised only when embedded within a coherent architectural framework.

AI can augment clinical decision-making by providing timely insights at the point of care. It can automate routine high-volume tasks, freeing clinician time and improving efficiency. Agentic AI takes this further by enabling systems to autonomously orchestrate multi-step processes, from triaging referrals to coordinating diagnostic pathways.

AI can also help assure quality and safety at scale, supporting consistent decision-making and identifying risks earlier.

These benefits depend on high-quality data, integrated systems and strong governance. EA puts those foundations in place so AI can operate effectively and responsibly within clinical workflows.

Standardised data models and consistent approaches to ontologies and model development also support faster assurance, reuse and scale.

Building the foundation for AI-enabled health systems

One of the emerging risks in healthcare is the proliferation of isolated AI solutions. While individually valuable, these point solutions introduce complexity and security vulnerabilities if not integrated into a broader system with appropriate data sovereignty controls.

A more sustainable approach is to design for enterprise-wide AI adoption. This involves creating a unified data foundation hosted within sovereign infrastructure, integrating AI capabilities with core clinical systems and enabling modular deployment where solutions deliver the greatest impact. Organisations with deep expertise in secure managed services, end-to-end systems integration and sovereign cloud operations are best placed to support this journey.

EA connects data, applications and processes into a coherent whole so AI investments support system-wide objectives. This requires a unified data foundation within sovereign infrastructure, tight integration with core clinical systems, and modular deployment to deliver the greatest impact.

The journey to improved patient outcomes

The ultimate measure of success is improved patient outcomes. EA supports this by enabling integrated, efficient care. When information moves securely across systems and organisations, patients can be triaged earlier, care pathways become more coordinated, duplication is reduced, and clinicians make better-informed decisions.

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Smart digital health systems show how these gains are achieved in practice. By aligning technology, processes and infrastructure, they improve patient flow, clinical safety and experience. EA also supports AI governance by validating training data, rigorously testing outcomes, and continuously monitoring clinical safety.

What Enterprise Architecture brings to the challenge

EA translates strategy into delivery through a structured approach to understanding the current state, defining a target state and planning the transition. It helps organisations identify dependencies, manage risk and prioritise investment by outcomes while staying aligned with national strategy and local needs. Partners with strengths in cybersecurity, digital transformation, and sovereign infrastructure can help deliver this ambition.

Realising the full potential of NHS transformation

The NHS has made strong progress in digitisation and infrastructure planning. The next phase depends on integrating and optimising these investments. Organisations that treat EA as a core capability will deliver programmes more consistently, unlock more value from digital investments including Electronic Patient Records and agentic AI, and build a health system that is productive, secure, sovereign and fit for the future.

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