Deploying AI technologies as part of your digital transformation

A practical guide for NHS organisations

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Document Control

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Document Purpose & Audience

This document is a practical guide for NHS organisations embarking on the journey of deploying Artificial Intelligence (AI) technologies, usually as part of a digital transformation, or aiming to accelerate the deployment of AI technologies in key settings. The document has been developed by NHS Midlands and Lancashire CSU (ML) Digital Transformation Consultants & Artificial Intelligence Practitioners, in consultation with Digital Innovation Subject Matter Experts and wider NHS colleagues.

This paper primarily targets the following audiences in accordance with the definitions from the AI Skills for Business Competency Framework by the Alan Turing Institute:

- **AI Professionals:** employees whose core responsibilities concern the use of 'data' and 'AI'.
- **AI Leaders:** those holding senior responsibility for the procurement and/or governance of artificial intelligence solutions.

The document will also be a useful source of information for **AI Workers** (employees not working primarily in 'data' or 'AI', but whose roles may be impacted by these technologies) and some of the content may also be usefully shared with a broader range of stakeholders, potentially including **AI Citizens** (members of the public or in the context of healthcare '**Patients**' who may be 'service users' to organisations making use of AI).

There are different levels of **'AI maturity'** across NHS organisations, ranging from 'new to AI' through to 'advanced practitioners'; there's also a breadth of clinical and non-clinical roles represented across AI networks and communities, with either full or part-time responsibility for using AI in their respective organisations. This document covers information and resources relevant to all.

AI: a unique opportunity and a challenge

AI represents both a unique opportunity and challenge for the NHS, in that it offers a world of endless possibilities but also includes risk and challenges. What seemed impossible yesterday could be common-place tomorrow, thanks to AI.

The World Health Organisation notes "*AI in health is not an end in itself, but a means to achieve its strategic priorities'*. The AI revolution can improve patient care, free up staff time and ease NHS pressures, but this can only be achieved by unlocking the innovative data-driven potential through best practice. While AI is an exciting opportunity, why apply the AI 'hammer' when all that may be required is a digital transformation 'screwdriver'. The Lord Darzi report of 2024 flags three key priorities for the NHS likely to be pivotal in the forthcoming NHS 10-Year Plan, namely:

- **analogue to digital**,
- **hospital to community,** and
- **sickness to prevention**.

AI and data play a pivotal role in achieving all 3 priority goals. There are however many considerations when deploying AI technologies, including:

- AI is moving at an **unprecedented pace**, fuelled by the advances in computational power, but there is inherent risk that by the time a component of AI technology is well understood for a particular healthcare setting, that the technological advances will have moved on.
- To harness the full potential, organisations need to **stay updated** on the latest developments, tools, regulations, ethical considerations and best practices. Selecting the appropriate AI tools and platforms for a specific use-case is critical for the success of a digital transformation which makes use of AI technology.
- The assumption that outputs from AI tools are 'good enough' without human oversight is incorrect right now; AI models have **limitations**, and they must be well understood by professionals and leaders seeking to make use of AI technologies. Knowing how to mitigate the risks from AI technological

limitations is an essential step for NHS organisations, as the risk for wrong information to be given should be understood and not knowingly have a detrimental impact on patient care.

- In the context of progress over perfection, organisations will need to carefully think about and understand their **appetite for risk**, balancing that against the potential rewards.
- The public, patients, clinicians and wider healthcare workers need reassurance that AI data-driven technology is **safe, effective and protects privacy**. Building that confidence and trust through meaningful engagement requires careful planning and execution.
- Solutions that include an element of **AI will most likely require changes** to established clinical and non-clinical workflows and with this comes the challenge of change, upskilling staff to new ways of working and dealing with resistance. Understanding how (and to what extent) users will perform their roles with AI enabled systems and data is critical.
- The level of **effort to integrate AI** technology into existing digital pathways should not be underestimated. Changes to existing IT and digital systems and data management need to be considered. Access to quality data and high compute power is needed.
- Most NHS organisations will be accessing and **utilising sensitive data** and therefore they need to be cautious about where and how the AI systems store and process the information.
- There's an underlying need to acquire AI/ digital transformation skills and talent to not only implement the new technology, but manage the change journey and then **maintain (and optimise)** AI in business as usual. This is a whole new way of thinking about 'digital/ system operations' and the exponential growth of AI has triggered an increase in demand for people with AI skills.
- AI will require varying levels of investment depending on the scale and complexity of the proposed deployment, but done right, the **benefits can be impactful** and long lasting.

Research carried out by ML/DT in 2024-25 has made it abundantly clear that **AI is front of mind** for our NHS colleagues, especially those with digital responsibilities. Early adopters are clearly activated, often motivated into exploring the use of automation in response to the top-down messaging of 'analogue to digital' along with the shift left 'hospital to community' and of 'sickness to prevention'. The NHS propensity for **'*hit and hope*'** investment in a "shiny new technologies", and it's associated risk, is well recognised, and there is strong appreciation of the need for a clear, up-front **articulation of the problem** to be solved by a digital transformation prior to embarking on a well understood journey of change.

This final need is also recognised at a national level, supported by Dr. Vin Diwaker (National Director of Transformation (interim) and member of the new NHS transition board) who at Digital Health Rewired in March 2025 encouraged digital and data colleagues to support the use of NHS Impact by teams to support transformation. NHS Impact is an Improvement Methodology which embeds shared purpose, investing in people, developing leadership, building improvement capability and capacity, and embedding improvement into management systems and processes front and centre creating an environment for digital transformation.

"No person's substantive time should be spent on a task where digital or AI can do it better, quicker and to the same high quality and standard."
The Rt Hon Keir Starmer KCB KC MP, Prime Minister, Press Release**, 2025**

AI: decoded

AI: what is Artificial Intelligence?

As described in the AI Playbook for UK Government (2025) "*AI is not new. The term 'artificial intelligence' was coined in 1956 during the Dartmouth workshop, a gathering of scientists intent on exploring the potential of computing to emulate human reasoning".*

There is no single definition suitable for every AI scenario, however, The Government's National AI Strategy (2021) defines 'Artificial Intelligence' as "*machines that perform tasks normally requiring human intelligence, especially when the machines learn from data how to do those tasks."*

AI can be thought as a set of technologies with many possible applications, with transformational impact on the economy.

Well managed deployments of AI in healthcare settings (clinical and non-clinical) offer a unique opportunity to overcome many challenges.

AI is everywhere in the news nowadays, but why? There was a turning point around 2022/23, AI became more and more popular due to the data volumes surrounding us, the increased availability of this data, the significant advances in AI-driven algorithm developments, coincident with rapid advances in computing power and storage.

> "Frontier models in 2024 are trained with 10,000x more computing power than in 2019, and we are likely to see a similar rate of growth by 2029. If progress continues at the rate of the last 5 years, by 2029 we can expect AI to be a dominant factor in economic performance and national security".
> UK Government AI Opportunities Action Plan, 2025

Think of Moore's Law when it comes to the exponential growth of AI, which predicted that the number of transistors (a key component for processing information) on a chip doubled approximately every two years. AI is a sprint in comparison, with reports indicating computational power doubling approximetaly every six months, enabling more complex, powerful AI algorithms to be developed.

AI: the basics

The first step in mastering AI is building a foundational understanding of AI literacy. The basics of AI and Large Language Models (LLMs) need to be well understood in order to apply the concepts in the real world.

To help address this, a basic AI literacy model has been developed to equip AI professionals and leaders prior to delving into AI applications in healthcare:

Figure 1: AI Glossary of Terms

AI: in Healthcare

Enthusiasm for the idea that AI might be useful for healthcare has increased steadily since the 1960s according to the Oxford Internet Institute. Today it represents a step change opportunity in transforming healthcare, by offering powerful and sometimes groundbreaking tools to enhance **healthcare operations**, **delivery of care** and most importantly **patient outcomes**.

AI in healthcare is about leveraging large volumes of data (often complex and unstructured) to help make better decisions, personalise care, optimise the resources available and generally improve productivity.

To help introduce the idea of AI in Healthcare there's a need to understand key technologies, usages and transformational potential. The following table takes AI literacy into action – this snapshot is just the tip of the (healthcare) iceberg when it comes to AI potential.

As a healthcare leader, the current thinking would suggest that the likely benefits to your organisation from the introduction of AI technologies might include:

- **Enhanced Diagnostics** - AI improves diagnostic accuracy by analysing vast amounts of data from medical records, imaging, and genomics.
- **Personalised Medicine** - enables personalised treatment plans tailored to individual patient profiles by analysing large volumes of data.
- **Operational Efficiency** - automation of routine tasks such administrative workflows, data entry, appointment scheduling etc.
- **Predictive & Preventative Care** - predicting patient outcomes allows for early intervention and preventive care, e.g. to predict the likelihood of stroke, or hospital readmissions.
- **Virtual Health Assistants** - virtual assistants and chatbots used in telemedicine to engage with patients and provide preliminary consultations.

- **Remote Monitoring** - AI-based tools in telemedicine help with patient triage, diagnostic, and remote monitoring.
- **Drug Discovery -** AI is accelerating drug discovery by analysing vast datasets of chemical compounds, biological targets, and clinical trials. Faster lab to patient timeframes.
- **Genomics** - to understand complex genetic data and uncover insights that can be used for personalised medicine.
- **Mental Health** - algorithms analyse speech patterns, social media activity, and other behavioural data to detect early signs of depression, anxiety, or other mental health issues.

➲ Spotlight on:
AI solution to help diagnose lung cancer quicker – North East and North Cumbria Provider Collaborative
NHS Trust trials Artificial Intelligence during consultations – The Royal Wolverhampton NHS Trust
Patient-centered care from AI-centered efficiencies – University Hospital Coventry & Warwickshire
Using an AI chatbot to streamline mental health referrals – Mind Matters Surrey NHS
Transforming cancer care by unlocking decades of NHS cancer data and hosting it on one powerful, secure, AI-ready platform – King's College London

What makes all these advances in AI healthcare possible? In simple terms, **high-quality data** availability, **AI-ready infrastructure** and **organisational readiness**.

Key components of **high-quality data** for AI:

Accuracy	Consistency	Completeness	Timeliness	Relevance
The level to which data is correct, precise, and free from errors	Standard format and structure facilitating processing	Complete data sets to train AI models	Up to-date data to reflect current environment and trends	Helping AI to focus on what is essential

Key components of an **AI-ready infrastructure**:

Hardware	Software	Networking	Storage & Analytics	Security
To perform the complex computations required by AI and machine learning algorithms	The tools and platforms that developers use to create, train, and deploy AI models, and APIs	Transfer and processing of large volumes of data required for AI processing	To store and process the vast and growing volumes of data consumed by AI	Safeguard against breaches, unauthorised access, and data loss

Key **organisational readiness** components for AI:

Strategy	Prioritisation	Knowledge/ Skills	Governance	Culture
Strategy for AI & Senior Sponsorship/ Champions	Identified and prioritised opportunities for value creation. Investment in the right areas	AI talent, competences (skills and experience), knowledge, including bespoke development	Governance structures that support responsible AI adoption	Innovation encouraged & embedded; workforce preparation & readiness; identified obstacles to AI adoption

AI: NHS context setting

A new 10-Year Health Plan for the NHS is under way and is expected to lean heavily on AI as an enabler for what is described as **once in generation opportunity** to set the NHS on a path for the future.

Lord Darzi's report on the state of the National Health Service in England (Sept 2024) outlines a 'tilt towards technology to unlock productivity' as one of the key emergent themes for how to repair the NHS. AI is a **cornerstone on the journey towards repair** and will be integral to the shift from 'analogue to digital', 'hospital to community' and 'sickness to prevention'.

> **"There must be a major tilt towards technology to unlock productivity. In particular, the hundreds of thousands of NHS staff working outside hospitals urgently need the benefits of digital systems. There is enormous potential in AI to transform care and for life sciences breakthroughs to create new treatments."**
> **Lord Darzi, Independent Investigation of the NHS in England, Sept 2024**

The NHS 2025/26 priorities and operational planning guidance does not provide clear guidance on expectations from AI; however, the Government's AI Opportunities Action Plan (2025) does provide an interim viewpoint, with some of the key themes expected to feature in the upcoming NHS 10-Year Plan.

Translating the Government's AI Opportunities Action Plan into NHS priorities may look like this:

Key themes	Sub-theme	NHS Priorities for AI Usage
Laying the Foundations to Enable AI	Building sufficient, secure and sustainable AI infrastructure	AI infrastructure should be **scalable and secure by design** to support the NHS 10-Year Plan (e.g. Frontline Digitisation, Networks and Cloud)
	Unlocking data assets	**Harnessing the power of NHS data** for AI application and innovation (e.g. FDP)
	Training, retaining, and attracting the next generation of AI professionals	**Building a world leading 'place' for AI talent**
	Enabling safe and trusted AI development and adoption through regulation, safety and assurance	**Well designed and regulated** NHS AI developments and applications
Changing Lives by Embracing AI	AI Adoption	At the core of delivering NHS priorities by adopting **high-quality, safe and trustworthy AI** at scale, helping shift the dial to a wellness model
	Adopt a "*Scan → Pilot → Scale*" approach	**A flexible and incremental approach**, to drive better patient experience and outcomes
	Enable public sector and private sector enterprise to reinforce each other in AI	**Collaboration at pace/ scale** with the private sector enterprise to increase AI adoption

Secure our future with homegrown AI	Having national champions at the frontier of AI capabilities	**NHS at the frontier** of the AI revolution by innovating, accelerating adoption, capability development and research

The NHS has all the ingredients to deliver against the AI Opportunities Action Plan, but those ingredients need a recipe or understood journey to help blend the different components and derive value and better patient outcomes. Time is of the essence, AI strategic thinking and **readiness starts right here, right now**, in preparation for the NHS 10-Year Plan.

AI: developing confidence through engagement & education

Artificial intelligence is a daunting concept, repeatedly used in science fiction, typically with negative connotations, with the general premise that robots will soon dominate the world. Think again, humans can think strategically, rationally, creatively, abstractly, use sentiment/ emotions, use tonality, and adapt swiftly to new situations whilst AI relies on the data provided by humans.

AI can be intimidating but it really shouldn't be. Think of AI as an overused 'bandwagon' term which both **excites and frightens** in equal measure, but when demystified a little, is more akin to a **manageable 'bolt-on'** to existing digital solutions.

The World Economic Forum describes the dual challenge of AI in health "*first, the inherently sensitive nature of health, where the protection of individuals is paramount, leads to a highly risk-averse environment. Second, societal scepticism towards AI, as highlighted by consumer sentiment surveys*".

The fear is that AI will replace human jobs, whereas right now it should be described as a 'partner' that can emulate parts of human intelligence and thinking, with the bonus that it can handle a range of complex tasks around the clock. AI should transform, not replace healthcare jobs.

A survey commissioned by the think tank The Health Foundation in June 2024, entitled *"AI in health care: what do the public and NHS staff think?"* provides a compelling insight into what the public and NHS staff think of AI. **There is support from both the public and NHS staff in using AI in healthcare settings**, however clear 'fears' remain present, with concerns around quality, dilution of patient/ clinical interactions, errors, lack of human oversight and disparity in the positive feeling (related to AI) across occupational groups.

Where do I start?

✓	Plot out the journey, starting with clarity on the problem to be fixed and be clear on where to get the help you need.
✓	Demystify AI and involve users in the process prior to embarking on any deployment.
✓	The public and NHS staff need to have confidence and trust in AI, feel engaged, able to contribute and be given assurance that the necessary controls are in place for this type of technology application.
✓	User research – do the homework when it comes to user needs. It will provide key insights into user thinking, behaviour and feelings towards AI.
✓	Develop comprehensive education and training for NHS staff working with AI.
✓	AI needs to be explainable, making AI decision-making understandable and transparent to all.
✓	Communicate the use of AI to patients and the public.
✓	Communicate the benefits of applying AI.

➲ Spotlight on:

Developing AI training for NHS Staff and why patient and public involvement is important – NHS AI and Digital Regulations Service for health and social care

AI: organisational challenges in digital transformation

With NHS resources stretched more than ever before, AI can be pivotal in addressing key organisational challenges. However, AI Professionals and Leaders are commonly faced with the mounting pressure of hastily fixing problems using AI technology as part of their existing digital transformation plans.

Through research and consultation with NHS client organisations, ML's Digital Transformation team uncovered several (common) AI pain points for those looking to deploy AI technology:

Common Pain Points & Challenges	
Difficulty articulating the real problem to be fixed	Pressure to reduce costs &/or improve productivity (AI seen as the 'golden ticket')
Pressure from existing suppliers to 'buy' AI	Ethical and security concerns
Perceived complexity & lack of visibility: technology, use case, market options	"I don't know what I don't know"
Limited proven case studies & blueprints	Mixing up the problem and the benefits
Process to procure/ route to market	Lack of investment funding

Given the current challenging financial and headcount pressures on NHS organisations many are asking the question "**how can I save money by using AI?".** Of course that is a valid question, but to succeed further depth is needed around what activity or process can be transformed in order to release time and/or cost.

The team then sought to understand what client organisations hoped for when attempting to 'fix the problem' using AI:

Common Gains & Expectations from partnering in Digitial Transformation	
Effective identification of suitable technologies	Safe & ethical deployment
Benefits realised	Central source of AI information/ knowledge
Streamlined procurement experience	High-quality data/ evidence of AI applications
Trusted advice	Access to expert knowledge and professionals

AI: benefits of deploying in NHS settings

The potential of AI is so wide ranging in healthcare that NHS organisations can find it difficult to encapsulate 'the benefits of applying AI'. Despite the experimental and iterative nature of AI, being precise about benefits is possible by breaking down the component parts into 'Value Areas' and measurable 'Indicators' – in some cases these indicators could be monetised.

Value Areas	Indicators
Productivity & Cost Reduction	• Workforce productivity, operational efficiency, resource utilisation (administrative & clinical) • Enhanced workflows, patient flow (decisions, diagnosis, time to treatment)
Workforce	• Staff/ job satisfaction/ increased morale • Reducing repetitive tasks, cognitive load, and burnout • Enhanced OD/ CPD • Increased retention
Patient Access/ Experience	• Improved patient experience, e.g. improved response times • Enhanced patient engagement • Improved patient/ clinical interactions (clinical time with patients)

	• Increased patient empowerment
Patient Safety	• Improved clinical decision-making • Increased accuracy & consistency e.g. imaging, diagnosis, data, reduction in errors, etc
Quality of Care	• Increase and improvement in predictive and preventative care • Increase and improvement in (delivery of) personalised care • Increase and improvement in (delivery of) precision medicine • Clinical risk reduction (reduced errors) • Better patient outcomes
Service Availability	• 24/7/365 availability • Increased access to and provision of services • Increased patient throughput
Equality, Diversity & Inclusion	• Reduced inequalities • Increased access to health and care services • Improved inclusion through AI-powered tools
Information Security	• Real-time cybersecurity • Increased threat detection • Improved access to key data sets

AI: manging risk when deploying

The growth and adoption of AI raises new considerations regarding **ethics, data privacy, cybersecurity and clinical safety**. The NCSC states that "*for the opportunities of AI to be fully realised, it must be developed, deployed and operated in a secure and responsible way*". Furthermore, the ICO insists on the ability to "*demonstrate, on an ongoing basis, how you have addressed data protection by design and default obligations*".

The following quadrant provides an effective foundational risk management strategy for NHS organisations navigating AI deployments and adoption.

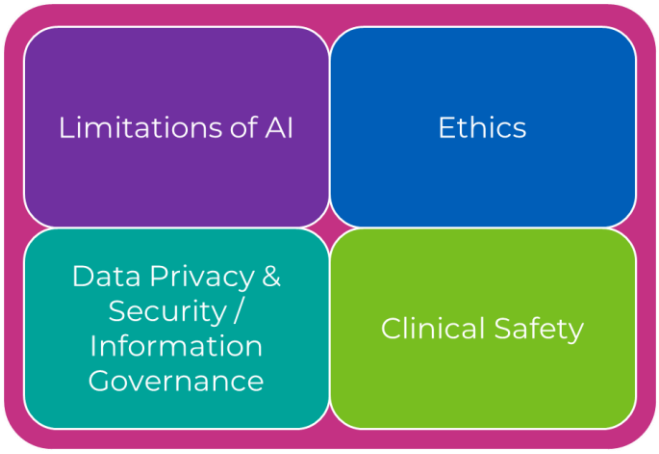

Figure 2: four 4 quadrants of managing risk in AI deployment

Limitations

Principle 1 of the Government's AI Playbook is *"You know what AI is and what its limitations are"* – AI systems currently lack contextual awareness and reasoning, and the limitations vary from one setting to another. AI does not provide a solution to every problem, but AI systems are evolving at an exponential rate.

Limitation	Description
Bias & Fairness	AI systems lack consciousness, and their outputs tend to replicate the bias present in the data they were trained on. This can lead to systematic inequality in outcome from a model.
Data quantity and quality	AI heavily relies on the quality and quantity of data to drive accuracy. Insufficient, poor or biased quality data can lead to issues.
Accuracy	Developing an AI system that's 100% accurate in all scenarios is difficult to achieve.
Transparency and explainability	AI models such as deep learning are so complex and sophisticated that it's difficult to track what inputs lead to what outputs.
Cost and sustainability	AI implementation can be complex, time consuming and have considerable compute costs. This will have an impact on organisation's sustainability agenda.
Generative AI also has further specific limitations:	
Hallucination (confabulation)	Large language models that perceive patterns or objects that are non-existent, creating nonsensical or inaccurate outputs.
Lack of critical thinking, personal experience and judgement	The appearance of reasoning but in no way sentient.
Sensitive or inappropriate context	Generating offensive or inappropriate content if not properly guided.
Domain expertise	Large language models are often generalist, lacking domain expertise, and are not a substitute for professional advice, especially in healthcare.
Dynamic real-time information retrieval	Many models do not have real-time access to the internet or data outside their training datasets.

Ethics

AI has the potential to transform healthcare and our NHS, but it also raises several concerns related to fairness, transparency and accountability. AI in the NHS should augment human decision-making, not replace it. Ensuring human control over AI is fundamental to the success of this digital transformation.

Key Challenge	How to overcome the challenge?
AI Bias & Fairness The risks of bias in decision-making, leading to inequalities in patient treatment. AI systems should not discriminate based on race, gender, socioeconomic status, or other factors unrelated to clinical outcomes.	**Bias & Fairness Testing** Ongoing bias audits and fairness testing can help identify and mitigate biases in AI systems. Using diverse, representative datasets in training AI to ensure that it performs equitably for all patients/ populations.
Transparency	**Explainability**

AI functioning as a 'black box', with decision-making processes not easily understandable by humans.	Where the AI decision-making process can be understood by healthcare providers. This helps build trust with healthcare professionals, allowing clinicians to clearly interpret AI-driven recommendations.
Accountability Who's accountable if an AI system makes an incorrect diagnosis, treatment or decision?	**Being Accountable** Defining roles and responsibilities around AI development, implementation and management (incl. decision-making) ensures that healthcare organisations retain clear accountability.

Data Privacy/ Security & Information Governance

AI systems rely on vast amounts of healthcare data (patient/ medical records), which makes data privacy and security a prime consideration. The Data (Use and Access) Bill will likely have transformative impact on data interoperability and so it is incumbent on us to understand the likely impact once it gains Royal Assent.

Protection of sensitive patient information and compliance with data protection regulations (e.g. UK GDPR) are critical aspects in using AI in healthcare. AI systems need to be **fully compliant** with legislation, regulatory requirements and policies. This is non-negotiable.

Key **considerations and actions**
Data Anonymisation: AI systems should use anonymisation techniques to ensure personal identifiers are removed from datasets before they are processed. Sensitive information is therefore not exposed but the AI system can still learn from the data.
Encryption: applying encryption to secure medical/ patient data. Ensuring unauthorised users cannot access sensitive healthcare information, even if data is intercepted or breached.
Access Controls: Implementing robust access controls ensures that only authorized personnel have access to. AI system should use MFA, role-based access, and audit trails to track who accesses the data and when.
Automated Monitoring – AI can be used to monitor networks and systems for suspicious activity, helping detect and respond to potential data breaches or security threats in real time.
Privacy Preserving AI – techniques like federated learning allow AI systems to learn from data across multiple locations without transferring patient data, enhancing privacy while still benefiting from diverse datasets.
Involve the relevant data protection and information governance specialists to ensure data protection by design principles.
Complete a data protection impact assessment (DPIA) • Article 35(3)(a) of the UK GDPR requires you to undertake a DPIA if you use AI (criteria applies) • The Information Commissioner's Office (ICO) also requires a DPIA if the processing of personal data involves the use of innovative technologies such as AI.

Clinical Safety

AI systems in the NHS must be developed and implemented in ways that align to clinical safety so as not to introduce risks leading to patient harm - this is mission critical.

"You need to monitor the AI's behaviour and have plans in place to prevent any harmful effects on users. This includes ensuring that humans validate any high-risk decisions influenced by AI and that you have strategies for meaningful intervention"
Government's AI Playbook, Principle 4

Key considerations and actions
Provide a **compelling body of evidence** which provides assurance that AI system are compliant with Clinical Safety Standards
Be compliant with DCB0129 and DCB0160 clinical safety standards. Any clinical use of AI in the NHS (like any other Digital/ IT system) requires this.
Public sector organisations are encouraged in using and being compliant with standards such as the **Algorithmic Transparency Recording Standard** (ATRS, part of the Government's National Data Strategy)
Embed **ongoing monitoring to investigate and mitigate new risks**, ensuring AI can only improve patient safety

➲ Spotlight on:
NHS AI and Digital Regulations Service for health and social care

AI: a model for technology selection

To help NHS organisations address the unique opportunities and challenges of AI, ML's Digital Transformation team developed a **three-pillar model** for contextualising AI, which can be used to help understand, categorise and identify potential solutions.

There's a constellation of **technologies, use-cases** and **market options** out there and it can be difficult to comprehend without extensive research and discovery. An Artificial Intelligence sector study 2023 by the UK Government noted more than 3,000 AI companies in the UK, generating more than £10 billion in revenues, employing more than 60,000 people in AI related roles.

The model demands that the specific problem (or problem statement) is understood before heading into deployment planning and technology selection. Clearly the solution being deployed should address the needs of users and service users.

"Provide a clear problem statement, rather than detailed specifications for a solution" Government Guidelines for AI Procurement: Establish the right route to market and focus on the challenge rather than a specific solution.

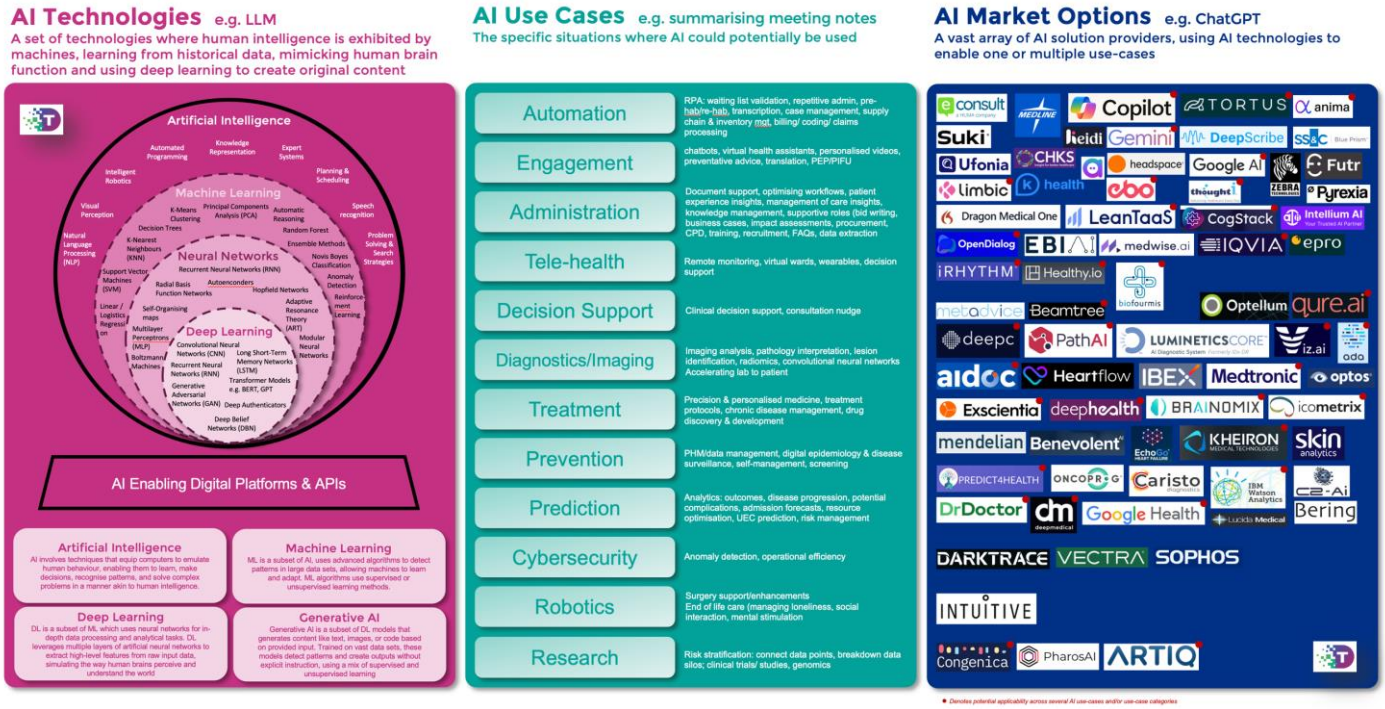

Figure 3: ML's Digital Transformation three pillar model for AI in Healthcare

There are several schools of thought in the healthcare arena as to where AI will deliver the most impact. Some believe that the most immediate opportunity lies in optimising patient services (e.g. engagement/ pathways/ workflows) and corporate services (e.g. administration, processes) due to lower regulatory requirements and clinical risk. McKinsey & Company's 2023 report states that "generative AI is likely to have the biggest impact on knowledge work, particularly activities involving decision making and collaboration, which previously had the lowest potential for automation".

There is no one size fits all, from organisations looking at building AI credibility through small proof of concepts, to those wanting to deliver AI benefits at pace, as well as those focused on the groundbreaking potential of AI in diagnostics, imaging and personalised health.

The three-pillar model allows NHS professionals and leaders to see the big picture and decide what is most suited to their specific organisational needs.

AI: the digital transformation journey

Keeping the three-pillar model at the forefront of thinking, consider the journey ahead to deploy the solution(s).

Traditional digital transformation/ change management lifecycles are a good starting point when thinking about AI deployments. The below activity cycle provides a foundational and solution agnostic approach to managing AI deployment activity lifecycles:

Figure 4: a typical digital transformation journey

Checklist

Remember AI is a journey, not an overnight fix. While each stage of the activity cycle is likely to require a degree of effort and investment, there are key practical steps that need to be considered for success – the following 15-point checklist provides a useful starting point:

#	ü	Consideration
1	☐	Appoint an AI Lead (for each problem/ mission) with laser focus from the outset, preferably with technical horizon scanning competencies, deep AI market intelligence/ knowledge, with an understanding of AI capabilities/ use-case applications in healthcare and experience in digital transformation or change management.
2	☐	Define the problem (that could be solved using AI) and what you want to achieve (the goal) – focus on the challenge not the solution. Always start with the problem statement when considering AI.
3	☐	Understand the needs of your users and service users (and accessibility requirements) and engage them in the process, this will help you identify levels of trust and confidence with the proposed changes.
4	☐	Evaluate if 'traditional' digital solutions can handle the volume, complexity and real-time nature of your requirement.
5	☐	Assess the suitability of AI technologies for your problem (capabilities and limitations).
6	☐	Identify and select the possible situations or appropriate use-cases for your problem (application of AI that could benefit your organisation). This is about organisational and user needs, pain points, measurable benefits and not what the AI technology can do. Avoid fully automated decision making and high-risk applications.
7	☐	Perform a capability maturity assessment, including data quality and availability, infrastructure readiness, cyber security, technical/ change skill-sets, domain expertise, governance and assurance.
8	☐	Evaluate the potential impact of the proposed AI solutions using cost vs benefit analysis (use the value areas/ indicators found herein as a starter).

9	☐	Establish clear risk management and governance arrangements – ensure your proposed AI solution is lawful, ethical, secure and safe-by-design.
10	☐	Develop a communication strategy and plan to support AI adoption – be open from the outset, explain and demonstrate AI to the target audiences.
11	☐	Identify routes to market (e.g. frameworks, dynamic purchasing systems) and AI market options – continue to focus on the challenge not the solution. Think about interfacing/ integration requirements when considering options (remember, AI as a 'bolt-on' to your existing digital systems).
12	☐	Develop the business case for AI – this may be at outline level (see Annex B for one page AI business case template) for simpler business cases/ approvals or scaling up to using the Treasury's Green Book Five-Case Model for larger scale/ complex developments requiring significant investment (which will of course consider governance and assurance requirements).
13	☐	Get to know the ten guidelines for AI procurement in the public sector; consider build, buy or reuse (or combine these approaches); make sure your organisation gets a fair deal from the commercial use of its data resources and expertise.
14	☐	Consider adopting a "*Pilot → Scale*" approach as described in the Government's AI Opportunities Action Plan. Scale AI initiatives incrementally. Start with proofs of concept (PoC) or pilot projects, allowing the testing of AI capabilities on a small scale prior to 'at scale' (or full) implementation. Leverage human oversight and feedback for fine-tuning.
15	☐	Continuously monitor the use of AI, its performance, effectiveness, safety, equity and make the necessary adjustments. Continue using human oversight and feedback to optimise AI in business as usual.

AI: collaborate to succeed

Figure 5: collaborate on a typical digital transformation journey

Collaboration is fundamental to deploying effective AI solutions, scaling up and maintaining momentum. There's a pressing need for organisations to establish (AI) working relationships with NHS partners and networks but also extending this to the private sector where beneficial. The Government's AI Opportunities Action Plan advocates collaboration with private sector enterprise to help increase AI adoption and while this can be advantageous, there are several NHS 'in-house' opportunities, services and expertise to be considered first:

Internal & Local Collaboration ***'NHS AI deployment networks'***	• Collaborate with other teams in your organisation to address knowledge or capability gaps (e.g. Digital/ IT, IG, Workforce). • Collaborate with local organisations starting on the AI journey or those more advanced that you can learn from (e.g. organisations that have deployed AI and/or specific solutions) – identify common ground, establish shared goals, learn from experience and team-up for AI success where possible.

Support Organisations & Services ***'NHS AI deployment support, services & domain expertise'***	Work with specialists and consider professional services (where further gaps have been identified in the AI activity lifecycle) from NHS support organisations. Examples of where delivery partners e.g. NHS ML can help include: • Digital Platforms • Digital Transformation & Programme Management • Digital Innovation • Business Intelligence & Analytics • Better Business Cases • Strategy, Transformation and Improvement Consultancy • Data Science • Information Governance • Clinical Safety & AI Ethics • Procurement • Clinical Redesign • Workforce Redesign/ People Solutions • Training Services • Cybersecurity Advisory
Networks/ Communities of Practice ***'NHS/ Public Sector AI learning networks'***	Connect with NHS AI networks and communities of practice. E.g: NHS AI Lab, NHS AI Ambassador Network, Cross-Gov AI Community, AnalystX.

Conclusions

Artificial Intelligence can be a useful component of a digital transformation, and like any digital change there are opportunities and challenges along the way. What makes using AI different is the sheer scale of the opportunity ahead and the almost limitless potential.

Public sector organisations are being encouraged to acquire AI and digital transformation talent but that isn't always practical or feasible given the current pressures on systems. Carefully planned projects deploying AI, and well-equipped AI capable teams have a greater chance at success as demonstrated in this paper, but this requires a collaborative NHS effort and where beneficial involvement from the private sector.

The NHS needs to lead the AI revolution by accelerating adoption and capability development. This paper provides practical steps to achieve this ambition, and whilst it doesn't cater for every eventually in an ever-evolving AI landscape, it provides some of the basic stepping stones towards a successful AI adoption.

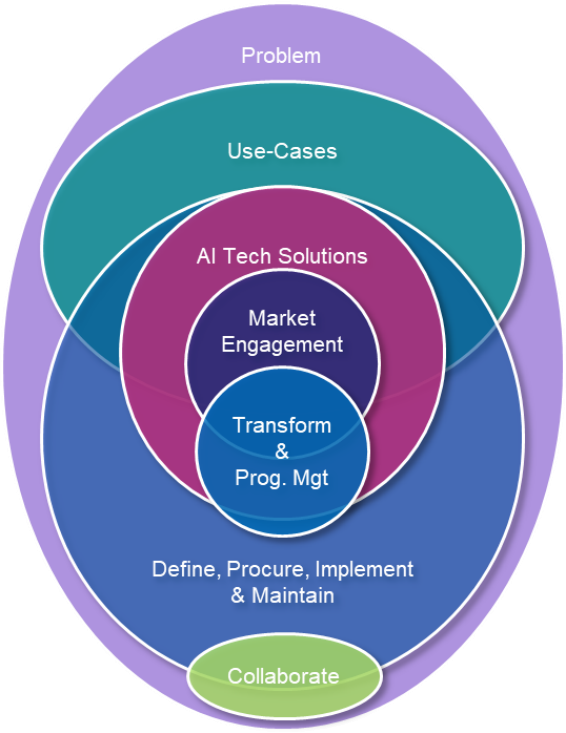

Figure 6: 10 Key Principles for AI Deployment as part of a digital transformation

10 key principles from this paper:

1. Start with a problem (that could be solved with AI technology) and define a goal
2. Identify the needs of users and service users
3. Engage, communicate and educate at all times to increase confidence and trust in AI
4. Understand AI technology sets and their capabilities
5. Select specific AI use-cases and categorise expected benefits
6. Identify AI market options, market engagement strategies and procurement routes
7. Apply proven methodologies and approaches to defining, procuring, implementing and maintaining AI
8. Embed digital transformation, change and programme management at the core of AI initiatives
9. Evaluate readiness for AI and consider collaboration or internal (NHS) support services
10. Focus on risk management (limitations, ethics, data privacy, cybersecurity and clinical safety) throughout the AI activity lifecycle

Resources

This paper has been developed using several principles and best practice found in publicly available reports, guidance documents and strategies.

- AI Opportunities Action Plan (2025)
- AI Opportunities Action Plan: government response (2025)
- AI Playbook for the UK Government (2025)
- Developing Healthcare Workers Confidence in AI (2023)
- Guidelines for AI procurement (2020)
- HM Government National AI Strategy (2021)
- Independent investigation of the NHS in England (2024)
- NHS 2025/26 priorities and operational planning guidance
- NHS AI and Digital Regulations Service for health and social care

In addition, this paper references the following resources:

- Alan Turing Institute – AI Skills for Business Competency Framework
- Artificial Intelligence Coined at Dartmouth
- ICO – What are the accountability and governance implications of AI?
- McKinsey & Company's – The economic potential of generative AI (2023)
- NCSC – AI and cyber security: what you need to know (2024)
- NHS Impact
- Oxford Internet Institute – Thinking Critically about AI in Healthcare (2023)
- Press Release: Prime Minister: I will reshape the state to deliver security for working people (2025)
- The Health Foundation – AI in health care: what do the public and NHS staff think? (2024)
- The World Economic Forum – The Future of AI-Enabled Health: Leading the Way (2025)
- Treasury's Green Book Five-Case Model
- UK Government Artificial Intelligence sector study 2023 (2024)
- WHO – Leading the Future of Global Health with Responsible Artificial Intelligence (2024)
- NHS England » Guidance on the use of AI-enabled ambient scribing products in health and care settings

Annex A: ML Services to help in AI deployment

NHS Midlands and Lancashire Commissioning Support Unit (CSU) and the wider CSUs family has recognised the challenges NHS organisations need to address as they embark on an AI Journey. Where NHS colleague organisations may feel it necessary to bolster their own capability ML have a mix of supplier-agnostic capability and AI knowledge that can be selected and tailored to fill specific gaps as shown in this diagram

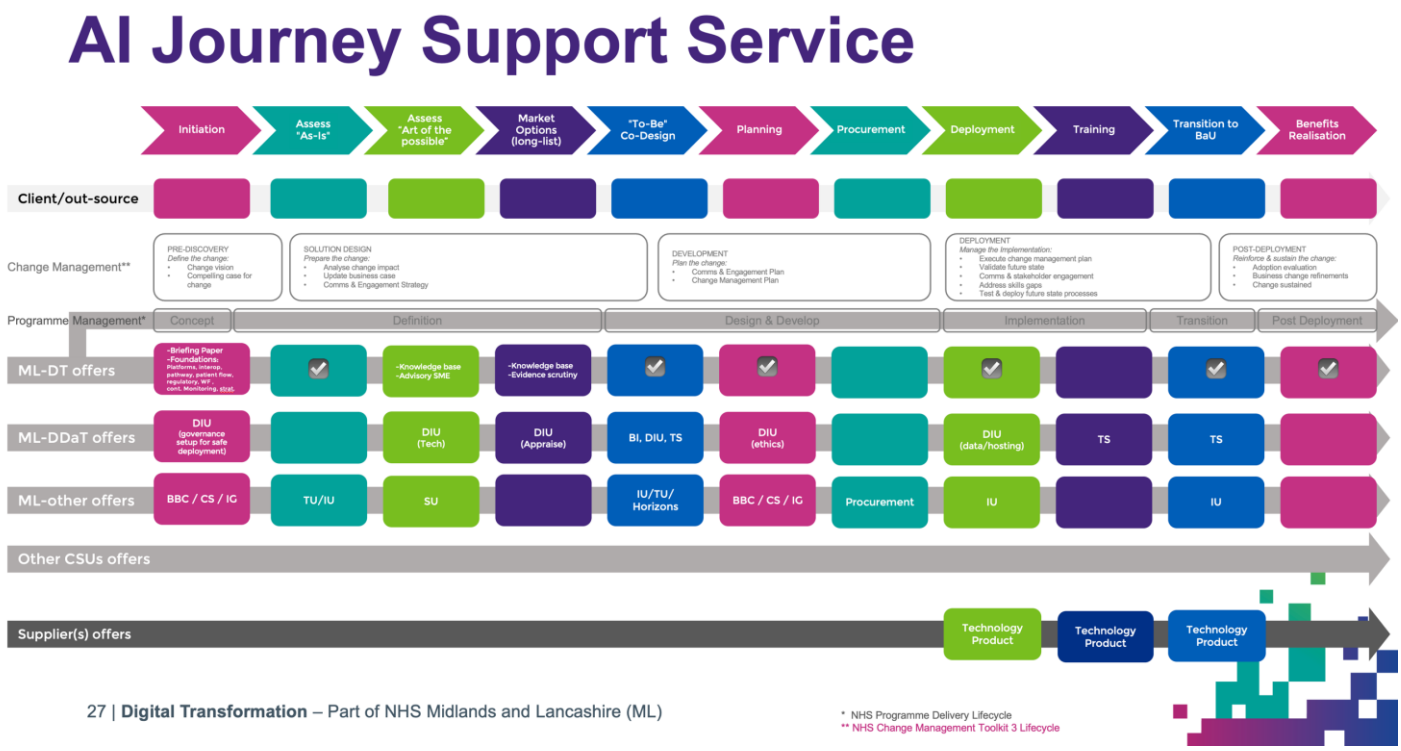

Figure 7: ML's AI journey support service options

Annex B: Simple Business Case Template

Where to start? Problem definition and outline business case for AI – a one page template for NHS organisations, can be really helpful in articulating the why, the what and the how before jumping into action.

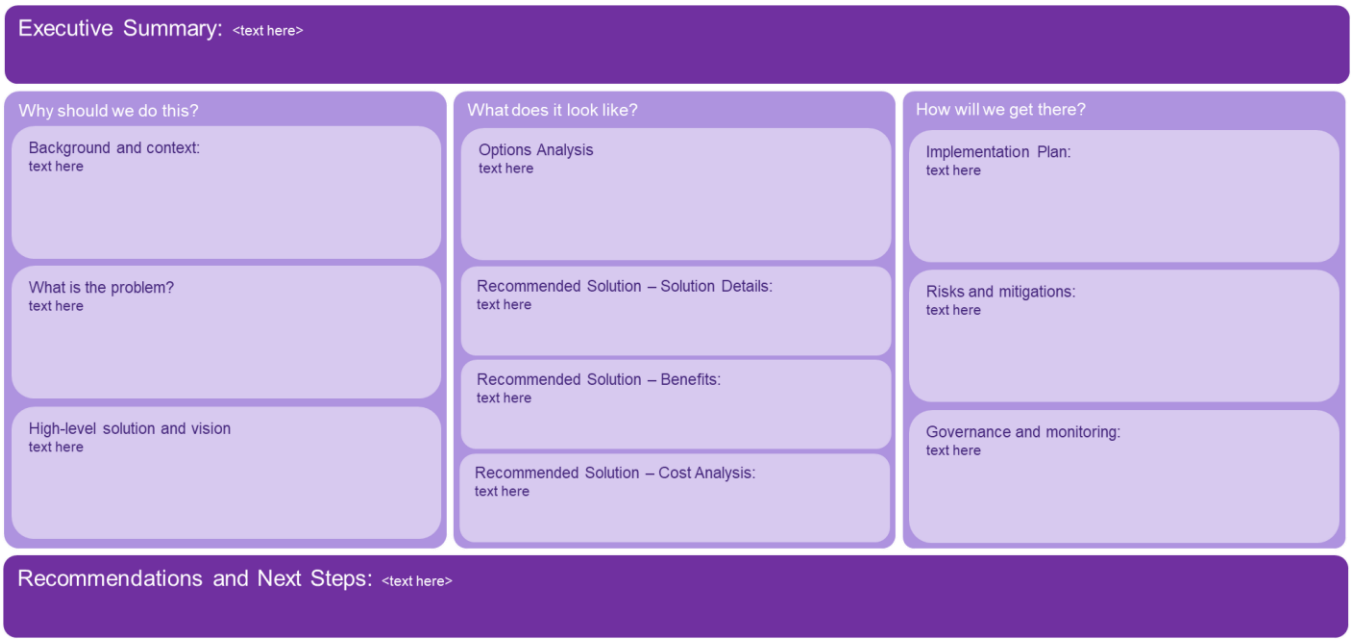

Figure 8: a simple 1-page business case template