# AI Factories mark next frontier in UK digital infrastructure



As AI reshapes industries and public services, the question facing UK digital leaders is no longer whether AI will transform their organisations, but how quickly they can adapt. Generative AI, large language models and machine learning are redefining competitive advantage, with infrastructure emerging as the decisive factor.

Traditional data centres—built for email and websites—cannot support AI’s extreme power and cooling needs. GPU-heavy racks now draw up to 600kW each, far exceeding the 5 to 15kW limits of older systems. This leap in energy demand produces vast heat, rendering standard air cooling obsolete. Liquid cooling and immersion technologies are no longer niche—they are vital tools for performance and sustainability.

Connectivity is equally essential. AI model training requires ultra-fast, low-latency connections across thousands of processors, while the sheer weight of GPU racks—sometimes topping 1,500kg—exceeds the load-bearing capabilities of legacy floors. These challenges extend to resiliency, orchestration, and ESG compliance, none of which traditional environments were designed to meet.

In response, a new class of AI Factories has emerged. These next-generation data centres are optimised to “manufacture intelligence” at scale, offering power density, cooling innovation and operational agility that older systems cannot match. The gap between AI-native and legacy-reliant organisations is widening—fast.

Three key trends are driving this transformation. First, new silicon architectures like NVIDIA’s Blackwell and Hopper GPUs require custom-built facilities with dense layouts and high-speed interconnects. Second, energy distribution systems must now accommodate racks drawing over 600kW. Third, cooling is an ESG priority—liquid-to-chip and immersion systems are helping cut carbon while boosting efficiency.

Data centres already consume up to 2% of global electricity—a figure set to climb sharply as AI workloads grow. Leading firms are responding. CoreWeave has deployed NVIDIA’s Blackwell Ultra GPUs using liquid cooling to manage power and heat demands. Its acquisition of Core Scientific expands high-performance capacity and signals the pace of infrastructure consolidation.

Governments are acting too. President Biden’s recent executive order calls for AI data centres powered by clean energy, highlighting infrastructure as a matter of national interest. In the UK, similar urgency will be needed to remain competitive and secure.

Companies like NEXTDC illustrate what AI-ready infrastructure looks like. With facilities across Australia, it offers rack densities up to 130kW today, designs for 600kW-plus, and features such as sovereign compliance, carrier-neutral access and subsea cable links. Validated by NVIDIA, its approach reflects the robust platforms required to support AI at scale.

The message is clear: legacy infrastructure is no longer fit for purpose. For the UK to lead in responsible AI, investment in power-dense, resilient, and sustainable data centres is essential. This shift not only ensures future competitiveness—it lays the foundation for a secure, efficient and carbon-conscious AI ecosystem.

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## Bibliography

1. <https://www.cio.com/article/4017280/why-ai-factories-matter-now-infrastructure-for-the-new-intelligence-era.html> - Please view link - unable to able to access data
2. <https://www.cio.com/article/4017280/why-ai-factories-matter-now-infrastructure-for-the-new-intelligence-era.html> - This article discusses the critical role of AI factories in the modern intelligence era. It highlights how traditional data centres are ill-equipped to handle the demands of AI workloads, which require substantial power, advanced cooling solutions, and high-speed connectivity. The piece emphasizes the need for purpose-built infrastructure to support AI's exponential growth and the importance of adapting to these new requirements to maintain a competitive edge.
3. <https://www.techradar.com/pro/ai-workloads-are-reshaping-infrastructure-heres-what-data-centers-need-to-know> - This article examines how AI workloads are transforming data centre infrastructure. It highlights the challenges posed by AI applications, such as high power consumption and significant heat generation, which are overwhelming existing systems. The piece discusses the shift towards liquid cooling solutions and the adoption of smart power management to meet the evolving demands of AI technologies.
4. <https://www.techradar.com/pro/how-can-we-create-a-sustainable-ai-future> - This article addresses the environmental impact of AI and data centres, noting that they currently consume 1-2% of global electricity, a figure projected to rise significantly by 2030. It explores innovations in hardware efficiency, such as improved GPUs and liquid cooling technologies, and discusses strategies like immersion cooling and direct liquid-to-chip cooling to enhance sustainability in AI infrastructures.
5. <https://www.pcgamer.com/hardware/racks-packing-nvidias-newst-and-shiniest-ai-supercomputer-blackwell-ultra-cards-have-just-been-deployed-by-coreweave/> - This article reports on CoreWeave's deployment of advanced AI supercomputing hardware featuring NVIDIA's latest Blackwell Ultra GPUs. The system requires extensive liquid cooling to manage the high power consumption of the GPUs, highlighting the need for specialized infrastructure to support cutting-edge AI workloads.
6. <https://www.tomshardware.com/tech-industry/artificial-intelligence/ai-hyperscaler-buys-its-cryptomining-partner-for-its-ai-gpus-and-data-center-infrastructure-coreweave-acquires-core-scientific-in-long-awaited-move> - This article details CoreWeave's acquisition of Core Scientific, marking a significant move in the AI market. The acquisition increases CoreWeave's capacity and simplifies future upgrades for deploying advanced NVIDIA HPC technologies, underscoring the importance of robust infrastructure in scaling AI operations.
7. <https://apnews.com/article/7458d9d1bb537929c5dcfb5192695223> - This article covers President Joe Biden's executive order aimed at enhancing energy resources for AI data centres in the U.S. The order seeks to expedite the development of large-scale AI infrastructure and clean energy facilities, addressing the rising energy demands of AI technologies and emphasizing national security concerns.