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AI's future is powered by hardware

Why specialized AI chips are reshaping business & innovation

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The rapid evolution of technology is fueling a substantial shift where hardware is set to become the cornerstone of next-generation advancements, particularly in the realm of artificial intelligence (AI). Traditionally, the spotlight has been on software as the primary driver of innovation. However, as AI continues to develop, the emphasis is shifting towards specialized hardware as a critical resource.

Historically, Moore's Law, a prediction made by the engineer Gordon Moore in 1965, refers to as the doubling of transistors on a microchip every two years, thus exponentially increasing computing power. The Deloitte Tech Trends 2024 report previewed that as we edge closer to the physical limits of Moore's Law, alternate pathways such as specialized hardware are coming to the forefront. A prime example of this is NVIDIA, whose tailored chips have become indispensable for AI computation workloads. In the ever-competitive tech landscape, having the right hardware can be a game-changer for enterprises aiming to harness the full potential of AI.

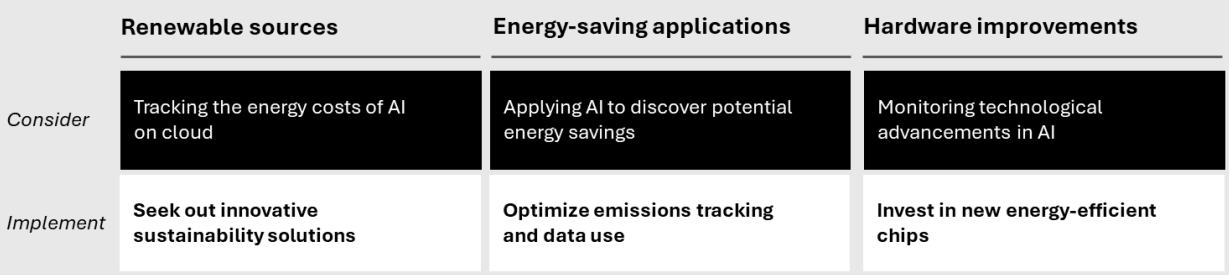
AI's advancements amplify the need for superior computing power and energy efficiency. From graphic processing units (GPUs), crucial for handling the high workloads of large language models (LLM) for AI model training to neural processing units (NPUs) in PCs, which mimic the brain's neural network, these chips are pivotal in the future of embedded AI.

Specialized hardware will likely be crucial to three significant areas of AI growth: AI-embedded devices and the Internet of Things, data centers and advances physical robotics, according to Deloitte Tech Trends 2025. For buying or renting specialized hardware, enterprises must re-evaluate and potentially overhaul their hardware strategies. This means considering factors like cost models, expected usage time frames and competitive pressures.

While organizations might be worried about getting their hands on AI chips like GPUs to run workloads, sustainability may well be a bigger issue, as AI requires unprecedented resources from data centers. Enterprises should take note of advancements in areas such as renewable resources, sustainability applications and hardware improvements over the next two years when considering data centers for AI.

Figure 2

Advancements in areas related to AI requirements



Source: Deloitte research.

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"AI becomes more entrenched in our daily lives and the decisive factor for enterprise success rests on the strategic deployment and continuous evolution of specialized hardware. As enterprises pivot toward leveraging the value of specialized hardware, they place themselves in an optimal position to unlock AI's full potential. This strategic choice not only enhances their competitive edge but also paves the way for a more sustainable and interconnected future" sais **Andrei Paraschiv, Consulting Partner, Deloitte Central Europe.**

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