Tech Trends *Every Leader* Needs to *Understand*

By tracking trends consistently and understanding their implications, leaders can develop stronger foresight capabilities and make better decisions.

by Amy Webb

IN THE PAST YEAR, humanity crossed multiple points of no return. This didn't happen gradually, but in sudden, irreversible leaps that have fundamentally altered the trajectory of civilization. Just as the first telescopes revealed the vastness of space, today's advances are revealing how much we don't understand about our own potential.

Let me be clear: The decisions we make in the next five years will determine the long-term fate of human civilization. This isn't hyperbole — it's the sobering conclusion drawn from our best available data. The convergence of technology isn't just changing how we work or live; it's changing what it means to be human.

As we show in the **Future Today Strategy Group**'s 2025 Tech Trends Report, we are now building systems that can re-program biology, reshape matter at the atomic level and process information in ways that defy classical physics. The implications extend far beyond quarterly earnings or market share.

In this article I will present 10 trends that leaders need to understand as they look to the future of their organizations. While individual trends aren't useful in isolation, when combined with scenario planning and strategic foresight, they become powerful tools for decision-making.

TREND 1: Living Intelligence

Living intelligence — the convergence of AI, sensors and biotech — isn't just another tech trend, it's the birth of systems that can truly interact with and adapt to the physical world. These technologies are combining to create feedback loops between digital and biological systems, enabling capabilities that would be impossible with any single technology alone.

Most organizations are hyperfocused on AI but are overlooking how sensors and biotechnology will amplify its impact. This myopic view means missing the bigger transformation: systems that not only process data but actively sense, interpret and modify their environment in real time. The next wave of innovation will come from this convergence. Leaders who fail to understand and prepare for living intelligence systems risk being blindsided by competitors who harness this convergence to create unbeatable advantages.

The rise of living intelligence will fundamentally reshape competitive dynamics across industries. Companies that grasp this convergence early will build systems that can sense market changes, adapt their operations and evolve their offerings in real time. This isn't just about automation or efficiency — it's about

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creating organizations that can perceive and respond to opportunities and threats with unprecedented speed and precision. Early movers will establish data and capability advantages that become nearly impossible for competitors to overcome.

Our clients are already experiencing the implications of living intelligence. While most started with narrow AI initiatives, the leaders are now racing to integrate sensor networks and biological interfaces into their operations. We're seeing healthcare companies combine AI diagnostics with continuous biometric monitoring, manufacturers deploying adaptive production systems that evolve their processes, and retailers creating environments that sense and respond to customer behaviour in real time.

TREND 2: Action Models

As AI shifts from text generation to real-world behaviour prediction, action models are eclipsing language models, fundamentally changing how machines learn. While language models excel at processing text, action models learn from behavioural data captured by ubiquitous sensors. These systems don't just predict what to say — they predict what to do, breaking complex tasks into executable steps and making real-time decisions based on environmental feedback.

As action models evolve, they'll become increasingly personalized, learning from individual behavioural patterns. We believe that personal Large Action Models (pLAMs) will seamlessly manage tasks, negotiate deals and make decisions based on deep understanding of user preferences, while maintaining privacy through edge computing. **Microsoft**'s work-in-progress LAM started with a training dataset comprising 76,000 task-plan pairs. Ultimately, 2,000 successful action sequences were used in the final training set.

The shift to action-based AI will create autonomous systems that can execute complex tasks without explicit programming, transforming automation across industries. This capability will revolutionize everything from robotics to personal assistance to business process automation. As these systems mature, they'll move beyond simple task execution to complex decision-making and strategic planning.

While many of our clients were early to invest in Large Language Models (LLMs) for content generation and customer service, the real transformations in the future will come from LAMs. Leading organizations are already exploring how LAMs could optimize supply chains, predict maintenance needs, and automate complex operational decisions. The most forward-thinking

companies in the future will develop hybrid systems that combine language and action models, creating AI that can both communicate and act.

By 2030, more than 125 billion connected devices will generate continuous behavioural data, fuelling LAMs' ability to learn and act autonomously. Robotics will hit an inflection point as AI and advanced sensors enable machines to adapt to unstructured environments and learn complex tasks in real time.

TREND 3: The End of Rigid Robotics

Traditional robots were confined to controlled environments, performing repetitive tasks. Now, AI-powered robots can perceive their surroundings, make decisions autonomously and adapt to changing conditions — marking the transition from programmed to intelligent automation.

The convergence of AI, advanced sensors, declining hardware costs and edge computing have removed historical barriers to robotic deployment. Combined with improving ROI metrics and labour shortages across industries, these advances are creating perfect conditions for widespread adoption.

Adaptive robotics will transform industries far beyond manufacturing, creating new operational paradigms in healthcare, agriculture and construction. In healthcare, surgical robots will enhance human capabilities; in agriculture, autonomous systems will enable precision farming; in construction, robots will perform dangerous or repetitive tasks. At least initially, this shift won't replace human workers but will augment them, creating new roles focused on robot supervision and strategic decision-making.

Manufacturing leaders we advise are rapidly reevaluating their automation strategies as adaptive robots become more viable. We're seeing healthcare executives explore robotic surgical assistants that could triple procedure efficiency, while construction firms are piloting autonomous equipment for site preparation and basic assembly. The most successful deployments focus on augmenting human capabilities rather than replacing workers.

TREND 4: Agentic AI

Beyond pattern recognition and prediction, agentic AI systems can understand context, formulate strategies and take independent action. These systems don't just respond to commands — they identify opportunities, set objectives and orchestrate resources to achieve them.

The real power emerges when multiple AI agents work together, each specializing in different tasks while coordinating towards common goals. This creates networks of AI systems that can handle complex, interconnected challenges that would overwhelm single agents.

Agentic AI will transform how organizations operate, moving from human-directed automation to AI-orchestrated autonomy. These systems will manage supply chains, optimize resource allocation and coordinate complex business processes with minimal human oversight. The shift will be gradual but profound — starting with discrete business functions before expanding to cross-functional operations. Success will depend on building trust, establishing clear governance and creating new frameworks for human-AI collaboration.

While executives recognize Agentic AI's potential, most struggle with implementation challenges. Leading organizations are starting small, deploying autonomous agents in controlled environments like inventory management or predictive maintenance. We're seeing increased concern about security, compliance and control as these systems become more autonomous. The most successful companies are investing heavily in training, governance frameworks and change management to prepare their organizations for this transition.

TREND 5: Metamaterials

Metamaterials, designed at the microscopic level using advanced tech, can manipulate light, sound, heat and mechanical stress in ways that were previously impossible. These engineered substances represent a fundamental shift from simply discovering materials to designing their properties from scratch.

AI has accelerated metamaterial development from theoretical models to practical applications. What required decades of research can now be simulated and optimized in hours, enabling rapid prototyping and commercialization of materials with unprecedented capabilities.

Metamaterials will revolutionize industries from construction to energy to telecommunications. Buildings will regulate their own temperature, infrastructure will adapt to environmental stresses and communication systems will achieve unprecedented efficiency. The technology will be crucial for climate resilience, enabling structures that can withstand extreme weather while dramatically reducing energy consumption. This shift will create new design paradigms and force industries to rethink traditional approaches.

Construction and engineering executives are scrambling to understand metamaterials' implications for their industries. While some view the technology as distant, leading firms are already forming partnerships with metamaterial start-ups and research institutions. We're seeing increased investment in R&D and pilot projects, particularly in energy efficiency and structural resilience. However, most organizations still lack the expertise to evaluate and implement these new materials.

TREND 6: Unlikely Alliances

The sheer scale of AI development — from computing power to specialized hardware — has made 'going it alone' impossible. Even the largest tech companies are finding they must collaborate with rivals to remain competitive and innovative. As AI workloads grow exponentially, control of cloud infrastructure becomes crucial. Strategic alliances between cloud providers, chip manufacturers and AI companies are creating new power dynamics that will reshape the tech landscape.

Cross-company collaboration will become the norm, with shared infrastructure, data and research accelerating innovation. However, this consolidation raises concerns about market concentration and competition. Organizations will need to navigate complex partnership networks while maintaining their competitive advantage.

We've observed that business leaders are challenged by a transformed vendor landscape where traditional competition lines blur. Many are finding their strategic planning complicated by uncertain alliances and shifting partnerships. While some embrace multi-vendor strategies to maintain flexibility, others are forming deeper partnerships with specific tech ecosystems. The most sophisticated organizations are creating partnership strategies that balance access to innovation with vendor lock-in risks.

TREND 7: Climate Innovation

Climate disasters are forcing rapid advancement in resilience technologies. What began as defensive measures is evolving into new markets for climate adaptation, spanning infrastructure, agriculture and emergency response systems.

The convergence of AI, sensors and biotechnology is enabling unprecedented capabilities in climate prediction, response and adaptation. These technologies are creating early warning systems and resilient solutions previously thought impossible.

Organizations must integrate climate adaptation into their core strategy as extreme weather reshapes markets and creates

Understanding the Difference Between Trends and Uncertainties Shapes Better Decisions	
Trends Are What We *Can* Know	**Uncertainties Are What We *Cannot* Know**
• Measurable changes occurring over time, backed by data and research.	• Future conditions that defy precise prediction or measurement.
• Observable patterns that show consistent movement in a specific direction.	• Variables that could develop in multiple different directions.
• Developments that can be tracked, quantified and validated through evidence.	• Events whose outcomes remain unknown despite careful analysis.

FIGURE ONE

new business imperatives. Climate adaptation technologies will become central to business operations and infrastructure development. Advanced materials will protect against extreme conditions, while emerging tech will optimize resource usage and predict environmental risks. Biotechnology breakthroughs will create climate-resistant agriculture and carbon-capture solutions. Organizations that fail to adapt will face increasing operational disruptions and market disadvantages.

Corporate leaders are shifting from viewing climate technology as a compliance issue to seeing it as a strategic necessity. We're seeing increased investment in resilient infrastructure, AI-powered climate modelling and a host of other solutions. Leading organizations are integrating climate adaptation into their core business strategies, while others struggle to balance short-term pressures with long-term climate resilience needs. By 2050, climate change could put $26 trillion in global financial assets at risk, forcing central banks to integrate climate risk into monetary policy.

TREND 8: Nuclear

Tech companies are bypassing traditional utilities to invest directly in nuclear power. Indeed, the push for reliable, carbon-free energy to power AI systems is making nuclear innovation a Silicon Valley priority. Small modular reactors offer a new paradigm: scalable, safer and faster to deploy than traditional nuclear plants. Their standardized design and reduced complexity are transforming nuclear power's risk-reward profile.

Small modular reactors (SMRs) are emerging as tech giants' answer to AI's massive energy demands, marking nuclear power's transformation from pariah to saviour. SMRs can be manufactured in factories and deployed within three to five years, accelerating nuclear adoption. Microsoft's new nuclear plant at Three Mile Island is expected to open in 2028 and will be renamed the Crane Clean Energy Center. The plant will power Microsoft's data centres.

The rise of SMRs could democratize nuclear power, enabling new deployment models beyond traditional utility structures. Tech companies will emerge as major energy producers, potentially disrupting traditional utility markets. This shift will accelerate the transition to carbon-free energy while raising new questions about power generation control and infrastructure security.

Energy-intensive industries are closely watching tech companies' nuclear initiatives. Many are re-evaluating their power strategies, considering direct investment in SMRs or partnerships with nuclear developers. Some organizations are now developing comprehensive energy strategies that include nuclear as part of their sustainability and operational resilience plans. However, concerns about public perception and regulatory uncertainty remain.

TREND 9: Quantum

After decades of theoretical promise, quantum error correction breakthroughs are finally enabling stable qubit operations. This fundamental advance removes the key barrier that has held quantum computing back from practical applications. Quantum algorithms could cut energy grid inefficiencies by 20 per cent, saving billions annually.

The integration of quantum and classical computing systems is creating immediate value, even before full quantum advantage. Organizations can begin capturing benefits while the technology continues to mature. From **AWS**'s Ocelot to Microsoft's Majorana 1, the focus is quickly shifting from AI chips to quantum computing chips, indicating another step closer to commercial viability. Organizations must prepare for quantum's impact on encryption, optimization and simulation as the technology moves from research labs to real-world deployment.

Quantum computing will revolutionize fields requiring complex simulations and optimization, from drug discovery to financial modelling. Early applications will focus on specific use cases

where quantum offers clear advantages, gradually expanding as the technology matures.

Organizations must balance preparation for quantum's transformative potential with realistic expectations about implementation timelines. While most executives acknowledge quantum's long-term opportunity, they struggle with discerning strategic importance and timing their investments. Some organizations are building quantum literacy, identifying potential use cases and developing quantum-safe security protocols. The most sophisticated companies are already experimenting with hybrid quantum-classical systems, gaining practical experience while preparing for quantum's broader impact.

TREND 10: Cislunar

The privatization of space is moving beyond launches to include orbital manufacturing, refuelling stations and maintenance services. This emerging infrastructure network will enable sustainable operations throughout cislunar space.

The discovery of lunar water ice and rare minerals, combined with zero-gravity manufacturing capabilities, is creating unprecedented economic opportunities. Space resources will transform industries from pharmaceuticals to semiconductors.

The commercialization of cislunar space will extend Earth's economic sphere to lunar orbit. In-space manufacturing will enable the production of materials impossible to create under gravity, while lunar resources will reduce dependence on terrestrial mining. This expansion will create new logistics networks, insurance markets and financial instruments. Organizations that establish early positions in this economy will gain significant advantages.

While space remains a frontier market, forward-thinking executives are already developing cislunar strategies. Manufacturing companies are exploring zero-gravity production possibilities, while logistics firms plan for orbital supply chains. However, most organizations struggle to evaluate space opportunities against terrestrial investments. Leading companies are forming partnerships with space start-ups to gain early access to these capabilities.

A To-Do List for Leaders

- Embed foresight into strategy by regularly assessing tech disruptions and aligning long-term vision with emerging trends.
- Require tech literacy at the board level to ensure informed decision-making on disruptive innovations.
- Allocate capital for innovation, balancing short-term returns with long-term investments in emerging technologies.
- Integrate scenario planning and strategic foresight into annual planning to anticipate volatility and new opportunities.
- Monitor weak signals and track emerging tech, geopolitical shifts, and societal trends to anticipate disruptions early.

Do the following now:

1. Strengthen infrastructure by upgrading networks, cloud systems and cybersecurity to handle rapid shifts in technology.
2. Develop cross-industry partnerships and collaborate beyond traditional sectors to drive innovation and expand market reach.
3. Expand global intelligence capabilities to track geopolitical, economic and tech shifts to anticipate disruptions and opportunities.
4. Adopt agile governance and implement flexible policies that can evolve with emerging technologies and global uncertainties.
5. Develop experimental sandboxes to test emerging tech, fostering a culture of rapid prototyping and iteration.

In closing

True disruption rarely emerges from a single trend. It comes from the collision of multiple forces across different domains. By tracking the right trends consistently and understanding their broader implications, any organization can develop stronger foresight capabilities and make better strategic decisions. *RM*

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