



2025 TECH TRENDS REPORT • 18TH EDITION

# EXECUTIVE SUMMARY

FTSG



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# INTRODUCTION



**You're reading the 18th annual edition of what was previously known as the Future Today Institute's Tech Trends Report. Our name has changed—we're now Future Today Strategy Group (FTSG)—but our goal remains constant: connecting foresight to strategy to drive meaningful organizational transformation.**

**This year's analysis spans 1,000 pages divided into 15 comprehensive reports. To access the full report or individual sections, [visit ftsg.com/trends](https://ftsg.com/trends).**

**What follows is our executive summary—a strategic compass for navigating a landscape where the bleeding edge now changes by the hour, not the year.**

**Amy Webb**Chief Executive Officer  
FTSG

## Beyond the Rubicon: Navigating Humanity's Point of No Return

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. We've moved beyond our mental models, beyond biological constraints, beyond social norms—into territory we can neither fully explain nor comprehend. Just as the first telescopes revealed the vastness of space, today's science and tech advances are revealing how much we don't understand about our own potential.

Yes, AI has made daily headlines, but it's just one piece of a larger transformation. Two other areas of technology—advanced sensors and biotechnology—are quietly advancing and converging as they evolve. That convergence is creating what we call “living intelligence:” systems that sense, learn, adapt, and evolve. Living intelligence will drive an exponential cycle of innovation, acting as an accelerant for technologies that had previously stalled, from quantum computing to robotics.

For some organizations, this will unlock unprecedented opportunities in everything from drug discovery to energy production to financial services. For others, it will trigger overwhelming disorientation as they struggle to adapt to change occurring faster than their ability to process it. The gap between leaders and laggards will widen dramatically, not over decades, but months.

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 tech isn't just changing how we work or live; it's changing what it means to be human. We're building systems that can reprogram 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.

This report isn't designed to predict the future. Its purpose is to help you navigate it. While individual trends aren't useful in isolation, when combined with scenario planning and strategic foresight, they become powerful tools for decision-making.

In a world that has moved beyond traditional boundaries, the goal isn't to get the future right—it's to get your decisions right in the present.

Welcome to the beyond.

**Amy Webb**CEO  
Future Today Strategy Group



## 10 Key Takeaways from the FTSG 2025 Tech Trends Report.

1

Living intelligence merges AI, sensors, and biotech into systems that think, adapt, and evolve beyond our grasp.

2

Action models eclipse language models as AI shifts from talking to doing, reshaping automation's frontier.

3

Robots finally break free from factory floors as advanced technology enables real-world adaptability.

4

Agentic AI systems set their own goals and execute complex decisions, augmenting human expertise.

5

Metamaterials rewrite physical limits, as engineered substances transform how we build our world.

6

Tech giants forge unlikely alliances as AI's demands force former rivals to share computing power and data.

7

The climate crisis spurs rapid innovation as extreme weather events accelerate next-gen technology adoption.

8

Nuclear power resurges as AI's energy appetite drives tech giants to invest heavily in small modular reactors.

9

Quantum computing reaches its inflection point as error correction breakthroughs unlock practical use cases.

10

Private enterprise colonizes cislunar space, birthing an economy between Earth and the moon that reshapes commerce.



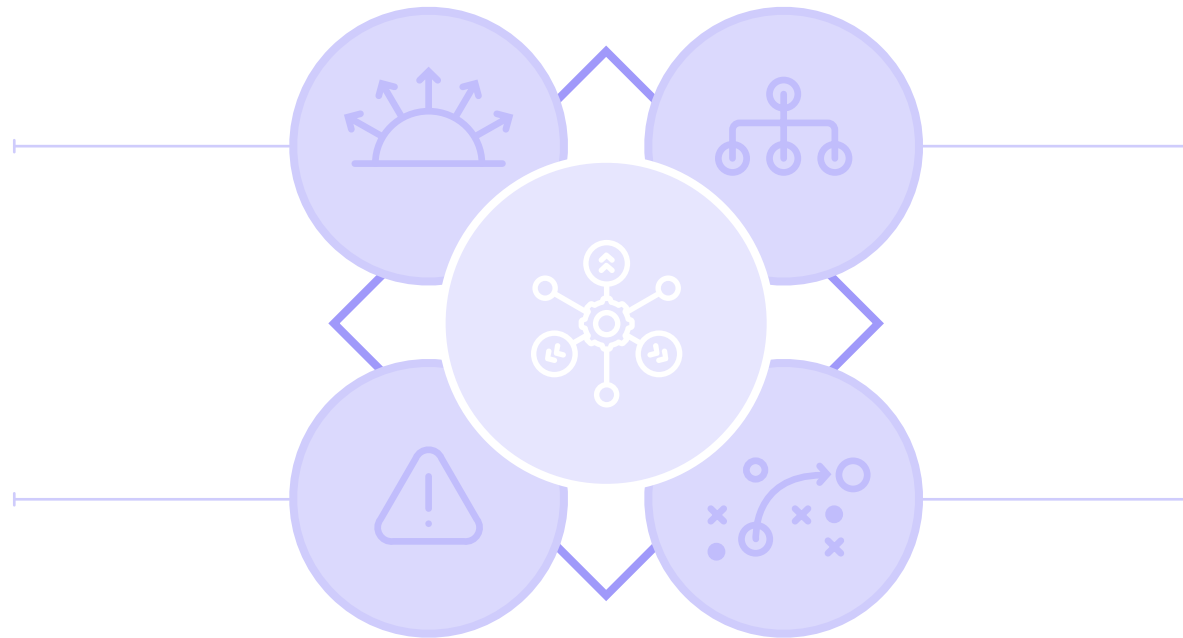
# This FTSG Framework helps leaders navigate complexity and make strategic decisions in a world of rapid change. Use our trends to shape your futures.

## Strategic Horizon Scanning

Identify which emerging technologies and trends will directly impact your organization's growth and evolution in the next 12-36 months.

## Risk & Disruption Mapping

Plot potential disruptions from both expected and unlikely sources. Rather than traditional risk assessment, focus on how technological convergence could create unexpected competitive threats or market opportunities.

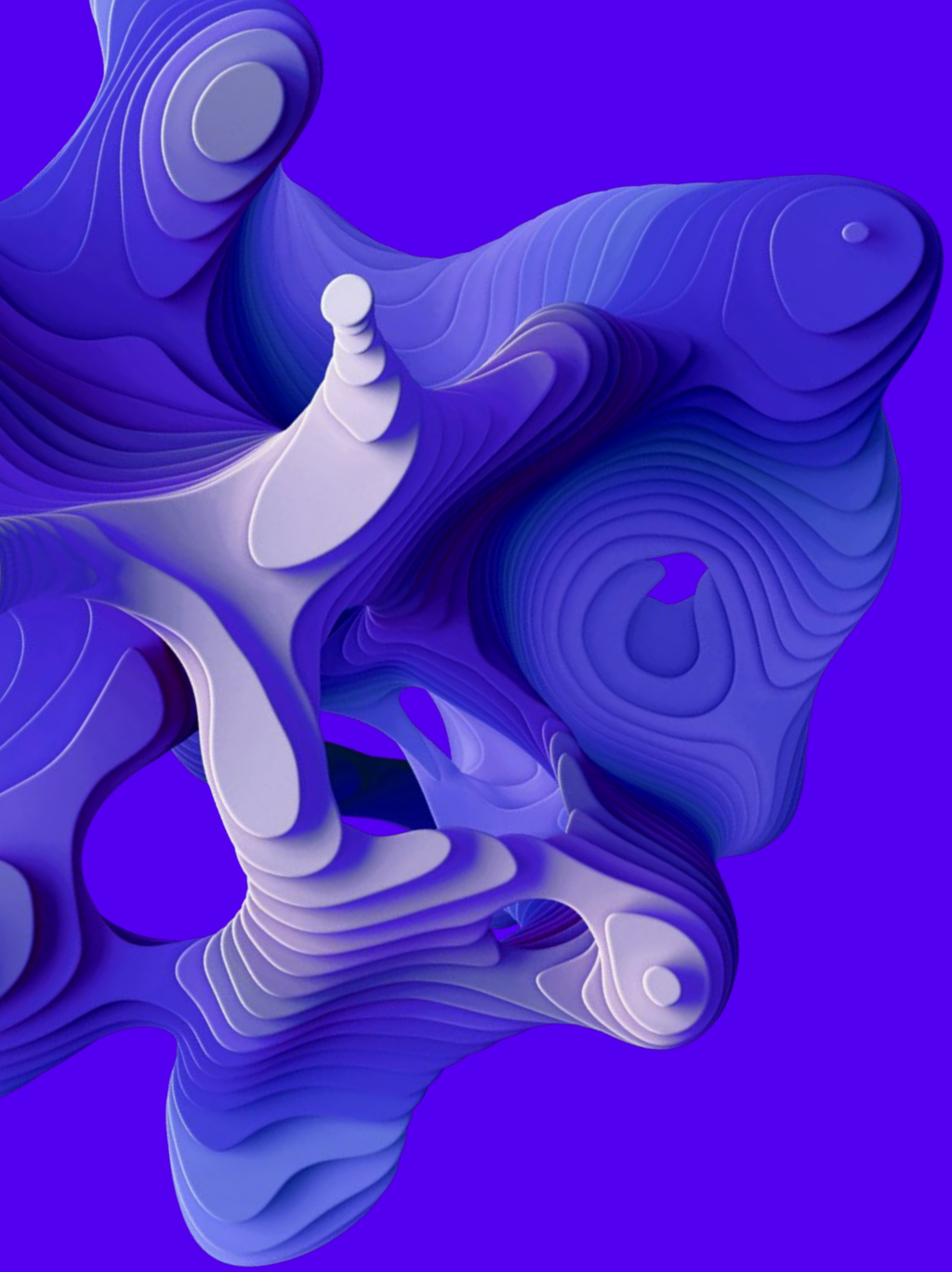


## Organizational Readiness

Evaluate your current capabilities against future requirements. This isn't just about technology adoption — it's about assessing if your culture, talent, and processes can adapt to and thrive in rapidly evolving market conditions.

## Action Planning

Transform insights into executable strategies. Move beyond traditional strategic planning to create dynamic response frameworks that allow your organization to pivot quickly as technological changes accelerate or decelerate.



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# KEY TAKEAWAYS IN DETAIL





# Living intelligence—the convergence of AI, sensors, and biotech—will create intelligent systems that can perceive, learn, and evolve beyond human programming.

## The Great Tech Convergence is Already Here

AI's integration with advanced sensors and biotechnology 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.

## Why Organizations Keep Missing the Signals

Most companies 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.

“The interaction and intersection of these technologies will create compounding effects, pushing the world into a new phase of technological disruption.”

- Amy Webb, “The Era of Living Intelligence”

### LIVING INTELLIGENCE

Artificial Intelligence

Advanced Sensors

Bioengineering



# Organizations that fail to understand and prepare for living intelligence systems risk being blindsided by competitors who harness this convergence to create unbeatable advantages.

## How this shift will reshape business & society through 2030

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 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.

## How leaders are being influenced by this shift today

Our clients are already experiencing the implications of living intelligence. While most started with narrow AI initiatives, leaders are now racing to integrate sensor networks and biological interfaces into their operations. We're seeing health care 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 behavior in real-time.

**200 million**  
**protein structures**  
**— the number of proteins**  
**in AlphaFold Server's**  
**free database.**



# Action models are eclipsing language models as AI shifts from text generation to real-world behavior prediction, fundamentally changing how machines learn.

## From Words to Actions

While language models excel at processing text, action models learn from behavioral 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.

## The Rise of Personal Action Models

As action models evolve, they'll become increasingly personalized, learning from individual behavioral patterns. We believe that PLAMs (Personal Large Action Models) 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 comprised of 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.

## How this shift will reshape business & society through 2030

Action models represent a fundamental shift in how AI systems operate in the real world. Unlike language models that operate primarily in the realm of text and content generation, action models will enable AI to understand and predict physical behaviors, movements, and decision-making patterns. 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.

## How leaders are being influenced by this shift today

While many of our clients were early to invest in 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  
behavioral data, fueling  
LAMs' ability to learn and  
act autonomously.



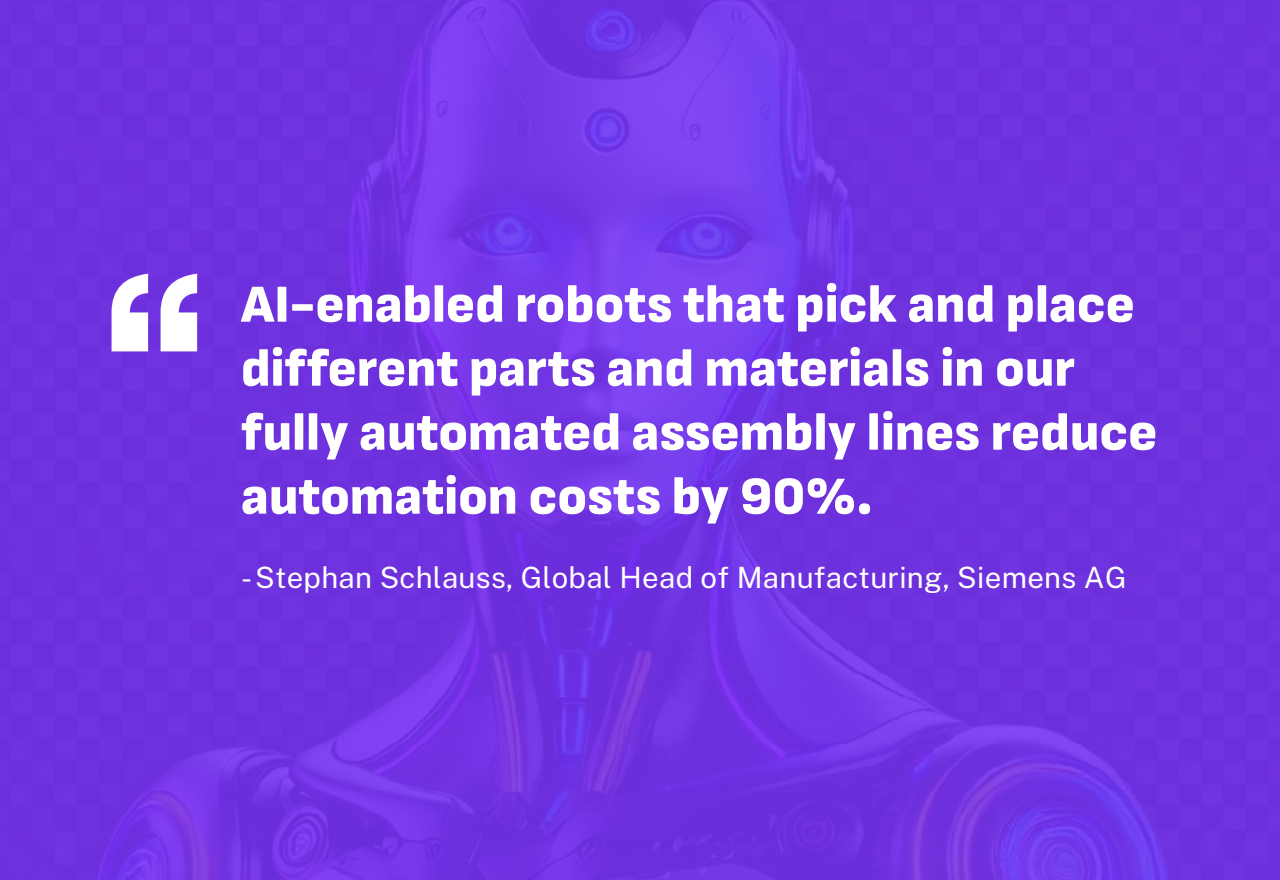
# Robotics will hit an inflection point as AI and advanced sensors enable machines to adapt to unstructured environments and learn complex tasks in real time.

## 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.

## Why Scale is Finally Possible

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



“ AI-enabled robots that pick and place different parts and materials in our fully automated assembly lines reduce automation costs by 90%.

-Stephan Schlauss, Global Head of Manufacturing, Siemens AG



# Adaptive robotics will transform industries far beyond manufacturing, creating new operational paradigms in health care, agriculture, and construction.

## How this shift will reshape business & society through 2030

Robotics will expand beyond traditional industrial applications into more complex, human-centric environments. In health care, 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 augment them, creating new roles focused on robot supervision and strategic decision-making.

## How leaders are being influenced by this shift today

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

The convergence of advanced sensors and AI will increase robotic autonomy by more than **60%.**

(Boston Dynamics)



# Agentic AI marks the transition from passive tools to autonomous systems that can set goals, make decisions, and execute complex strategies independently.

## The Rise of AI That Acts

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.

## Multi-Agent Collaboration Changes Everything

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

**72%**  
of enterprises using AI agents  
achieve business process  
efficiency gains.

(Stanford HAI Survey, 2024)



# Organizations must prepare for a world where AI systems make and execute decisions autonomously, fundamentally altering business operations.

## How this shift will reshape business & society through 2030

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.

## How leaders are being influenced by this shift today

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.

AI-powered agents could automate **80%** of coding tasks by 2030.

(MIT CSAIL)





# Metamaterials are revolutionizing construction and manufacturing, creating substances with properties that transcend natural limitations.

## Nature's Rules Are Being Rewritten

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

## From Theory to Commercial Reality

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.

**“ In metamaterials, we go beyond natural arrangements to a new level of organization. We design our own collection of tiny structures using multiple materials (such as gold and glass). Like regular materials, the electromagnetic properties of metamaterials depends on how we shape and arrange these structures. The difference is, we can create new properties that are not found in nature. And that's what metamaterials are all about.**

- Dr. Nader Engheta, H. Nedwill Ramsey Professor,  
School of Engineering and Applied Science at University  
of Pennsylvania School of Arts and Sciences



# Metamaterials will transform the built environment, enabling self-cooling buildings, ultra-resilient infrastructure, and adaptive structures.

## How this shift will reshape business & society through 2030

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.

## How leaders are being influenced by this shift today

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 startups 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.

Acoustic metamaterials can reduce sound transmission by up to **94%**, enabling quieter buildings, aircraft, and industrial environments.

(Boston University)



# Tech giants are forming unprecedented partnerships as AI's massive computational demands force former competitors to share resources and infrastructure.

## Competition Gives Way to Coopetition

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.

## The Cloud Becomes the New Battleground

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.

**Tech giants and sector leaders have a synergistic relationship: industry expertise helps make technology advancements actionable, and industry leaders can't advance without new computational and AI capabilities.**



# The era of tech companies operating in isolation is ending, as AI's demands create complex networks of interdependent partnerships.

## How this shift will reshape business & society through 2030

These strategic alliances will fundamentally alter how technology is developed and deployed. 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.

## How leaders are being influenced by this shift today

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.

Amazon committed up to **\$4 billion** to support Anthropic's AI research, embedding its Claude models into AWS infrastructure.



# Extreme weather events are accelerating technological innovation as climate adaptation becomes an urgent business imperative across every industry.

## Crisis Drives Commercial Breakthroughs

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.

## Smart Systems Reshape Climate Response

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.



**82%**  
of investors believe that  
publicly held financial services  
companies that better anticipate  
environmental risks are more  
likely to succeed financially.

(Harvard Business Review)



# Organizations must integrate climate adaptation into their core strategy as extreme weather reshapes markets and creates new business imperatives.

## How this shift will reshape business & society through 2030

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.

## How leaders are being influenced by this shift today

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 modeling, 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.

(IMF)



# **Nuclear power's revival will reshape energy markets and corporate strategy as tech companies become major players in power generation.**

## **Big Tech Drives Nuclear Renaissance**

Tech companies are bypassing traditional utilities to invest directly in nuclear power. The push for reliable, carbon-free energy to power AI systems is making nuclear innovation a Silicon Valley priority.

## **SMRs Change the Nuclear Equation**

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.



**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 centers.**



# Small modular reactors emerge as tech giants' answer to AI's massive energy demands, marking nuclear power's transformation from pariah to savior.

## How this shift will reshape business & society through 2030

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.

## How leaders are being influenced by this shift today

Energy-intensive industries are closely watching tech companies' nuclear initiatives. Many are reevaluating 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.

Small modular reactors can be manufactured in factories and deployed within **3-5 years**, accelerating nuclear adoption.





# Quantum computing reaches its inflection point as error correction breakthroughs and hybrid systems bring practical applications within reach for the first time.

## Error Correction Changes Everything

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.

## Hybrid Systems Bridge the Gap

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' 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.

## How this shift will reshape business & society through 2030

Quantum computing will revolutionize fields requiring complex simulations and optimization, from drug discovery to financial modeling. 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.

## How leaders are being influenced by this shift today

While most executives acknowledge quantum's long-term opportunity, they struggle with 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.

Quantum algorithms could cut energy grid inefficiencies by **20%,** saving billions annually.

(Siemens Quantum Energy)



# Private enterprise is colonizing the space between Earth and the moon, creating a new economic frontier that will reshape commerce and resource extraction.

## Space Infrastructure Goes Commercial

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

## New Resources Drive New Markets

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.

**\$1.8 billion**  
Estimated size of the space  
economy by 2035

(World Economic Forum)



# The cislunar economy will create new industry leaders as space capabilities become critical for competitive advantage across sectors.

## How this shift will reshape business & society through 2030

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.

## How leaders are being influenced by this shift today

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 startups to gain early access to these capabilities.

More than  
**\$100 billion**  
is being invested by  
private companies  
and national space  
agencies in cislunar  
infrastructure.



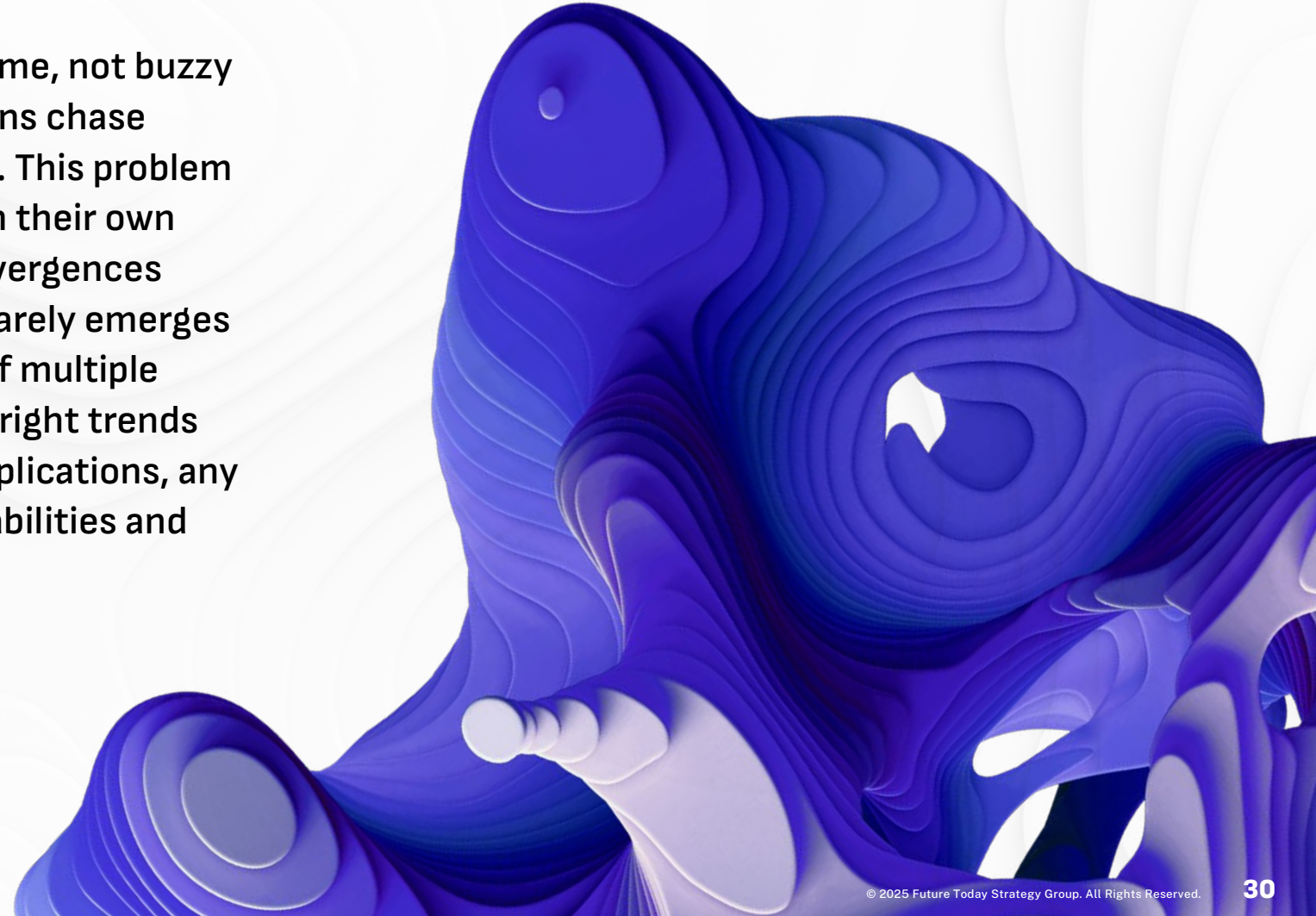
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# BEYOND TRENDS



## Many organizations confuse what's trendy with true strategic trends.

Trends are measurable changes occurring over time, not buzzy headlines or viral tech fads. Yet most organizations chase shiny objects while missing real strategic signals. This problem compounds when companies only track trends in their own industry, which blinds them to the powerful convergences happening at the intersections. 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.





## Understanding the difference between trends and uncertainties shapes better strategic decisions.

### Trends are what we *can* know

- ▼ Measurable changes occurring over time, backed by data and research.
- ▼ Observable patterns that show consistent movement in a specific direction.
- ▼ Developments that can be tracked, quantified, and validated through evidence.

### Uncertainties are what we *cannot* know

- ▼ Future conditions that defy precise prediction or measurement.
- ▼ Variables that could develop in multiple different directions.
- ▼ Events whose outcomes remain unknown despite careful analysis.



# Trends reveal transformative opportunities, but only if you ask, “What if?”

## Our research uncovers what others are missing, such as:

Topological qubits could finally solve quantum computing’s stability problem. Microsoft’s breakthrough shows a path to scalable quantum systems without the massive error correction overhead.

Spatial computing will transform workplace collaboration, enabling seamless integration of virtual and physical spaces. Early movers will reshape how teams interact and solve problems.

Generative AI is revolutionizing how robots learn, combining sensor data, human demonstrations, and internet-scale training. This breakthrough will finally make robots adaptable enough for real-world deployment.

Nanotech breakthroughs in materials science will enable self-healing infrastructure and smart surfaces. Researchers can develop products with unprecedented properties and capabilities.

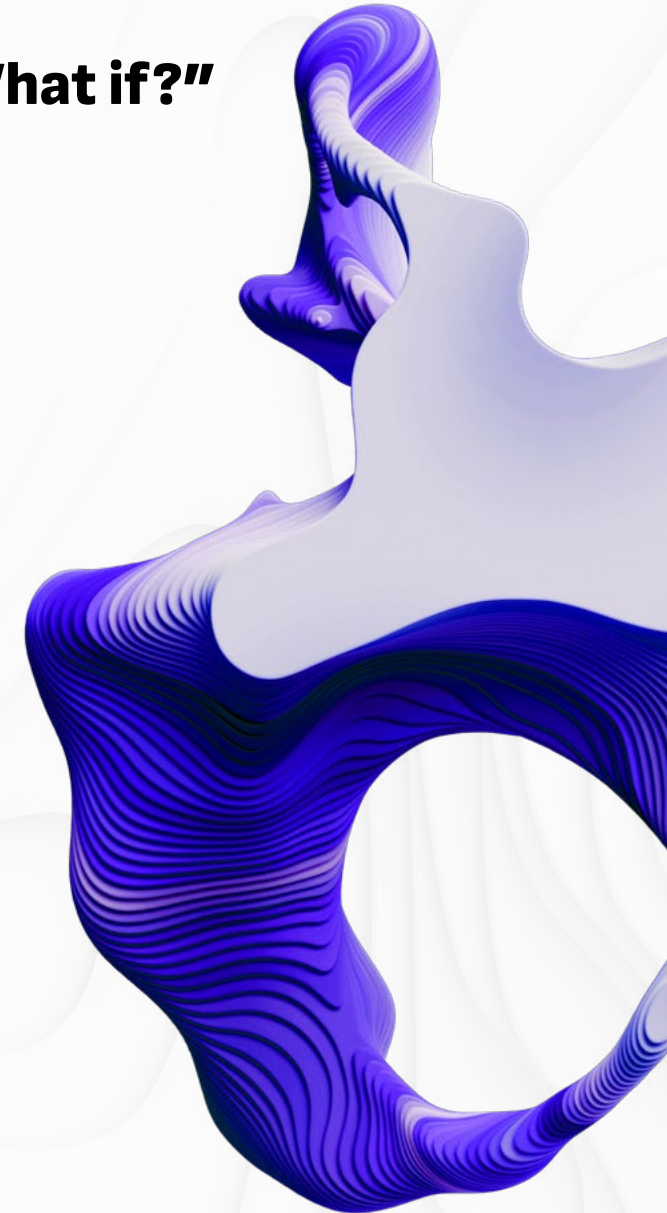
Edge computing combined with 5G will enable real-time processing at unprecedented scale. Organizations can deploy new solutions anywhere, creating truly distributed operations.

Synthetic biology will create new possibilities for sustainable manufacturing and carbon capture. Teams can redesign supply chains and create innovative climate solutions.

GenAI-powered search is evolving from link lists to conversational answers. Marketers can transform how they reach customers by optimizing for this new paradigm of discovery and engagement.

Augmented reality will transform customer experiences and worker training. HR leaders can create immersive interfaces that blend digital and physical worlds.

Smart materials will enable adaptive infrastructure and self-optimizing systems. Designers can create buildings and products that respond to environmental changes.







## These trends also create new vulnerabilities.

### Here's where your organization might be most exposed

Small language models make AI deployment easier and cheaper, creating security blind spots as departments bypass IT to implement their own solutions without proper oversight.

Synthetic biology democratizes biotech capabilities, but also creates new risks. Safety protocols designed for traditional threats can't handle these emerging biological hazards.

Privacy regulations can't keep pace with AI's data analysis capabilities. Legal teams using traditional compliance frameworks will leave organizations exposed to new forms of liability.

Spatial computing creates new attack surfaces in physical spaces. Facility managers and security teams lack protocols for securing augmented and mixed-reality environments.

Decentralized systems challenge traditional governance structures. Risk managers using centralized control models will struggle as operations become more distributed.

Computer vision advances enable unprecedented surveillance capabilities. Ethics boards lack frameworks to address the responsible use of these powerful monitoring tools.

Deep learning models can make critical decisions without clear audit trails. Compliance teams can't explain AI decisions using traditional accountability frameworks.

Cross-platform data flows create new vulnerabilities. IT teams focused on securing individual systems miss risks in the interconnections between emerging technologies.

Fast-learning robots could make entire skill sets obsolete overnight, forcing rapid workforce transitions. HR teams aren't prepared for this pace of role displacement and retraining.





# Time of impact of trends will vary by industry.



	LIVING INTELLIGENCE	AI	BIO-ENGINEERING	ADVANCED SENSORS	COMPUTING ARCHITECTURE	META-MATERIALS	AR/ VR/ XR	WEB3 INFRASTRUCTURE	MOBILITY	ROBOTICS	CLIMATE & GREEN TECH	QUANTUM	SPACE TECH
Agriculture	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	LOW RELEVANCE	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	1-3 YRS
Architecture, Built Environment	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS
Automotive	1-3 YRS	1-3 YRS	3-5 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	3-5 YRS	3-5 YRS
Aviation, Travel	3-5 YRS	1-3 YRS	3-5 YRS	1-3 YRS	1-3 YRS	3-5 YRS	3-5 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	3-5 YRS	3-5 YRS
Construction, Engineering	3-5 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	3-5 YRS	1-3 YRS	1-3 YRS	3-5 YRS	3-5 YRS
Consumer Packaged Goods	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	3-5 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	1-3 YRS
Financial Services, Banking	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS
Government, Policy	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	3-5 YRS	1-3 YRS
Health Care Systems & Services	1-3 YRS	1-3 YRS	3-5 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	3-5 YRS	1-3 YRS	1-3 YRS	3-5 YRS	5-7 YRS
Hospitality	3-5 YRS	1-3 YRS	3-5 YRS	1-3 YRS	3-5 YRS	3-5 YRS	1-3 YRS	5-7 YRS	3-5 YRS	1-3 YRS	1-3 YRS	5-7 YRS	3-5 YRS
Insurance (P&C)	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS
Insurance (Health & Life)	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	3-5 YRS	3-5 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS
Media	LOW RELEVANCE	1-3 YRS	LOW RELEVANCE	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	LOW RELEVANCE	3-5 YRS	1-3 YRS	5-7 YRS	3-5 YRS
Media (News)	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	LOW RELEVANCE	1-3 YRS	1-3 YRS	5-7 YRS	3-5 YRS
Pharmaceuticals, Medical Products	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	LOW RELEVANCE	5-7 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS
Retail	3-5 YRS	1-3 YRS	3-5 YRS	1-3 YRS	3-5 YRS	3-5 YRS	1-3 YRS	5-7 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	3-5 YRS
Space, Aerospace Defense	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	5-7 YRS	3-5 YRS	1-3 YRS	1-3 YRS	5-7 YRS	1-3 YRS
Supply Chain, Logistics	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS
Telecommunications	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS	1-3 YRS



# To thrive in a world of rapid change, organizations must be agile, resilient, and future-ready.

## We recommend that every organization do the following now.

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



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# AUTHORS & CONTRIBUTORS



## Amy Webb

### Chief Executive Officer

Recognized as the global leader in strategic foresight, Amy Webb advises leaders through disruptive change, enabling them to navigate an unpredictable future with confidence and take actions that address global challenges, create sustainable value, and ensure a company's long term growth.

As Founder and CEO of the Future Today Strategy Group (FTSG), Amy pioneered a unique quantitative modeling approach and data-driven foresight methodology that identifies signals of change and emerging patterns very early. Using that information, Amy and her colleagues identify white spaces, opportunities and threats early enough for action. They develop predictive scenarios, along with executable strategy, for their global client base.

In 2023, Amy was recognized as the #4 most influential management thinker in the world by Thinkers50, a biannual ranking of global business thinkers. She was also featured on the 2021 Thinkers 50 list, was shortlisted for the 2021 Digital Thinking Award, and received the 2017 Thinkers50 Radar Award. Forbes called Amy “one of the five women changing the world” and she was honored as one of the BBC’s 100 Women of 2020.

Amy is regularly asked to advise policymakers in the White House, Congress, US regulatory agencies, the European Union and United Nations. She is an inaugural member of the World Economic Forum’s Strategic Foresight Advisory Board, a member of the WEF’s Global Risks Board, and is an AI Governance Alliance partner. Amy was elected a life member of the Council on Foreign Relations and is a member of the Bretton Woods Committee. She served as a Delegate in the former U.S.-Russia Bilateral Presidential Commission, where she advised on the future of technology and international diplomacy.

For the past decade, Amy has served as a professor at New York University’s Stern School of Business, where she developed and teaches the MBA-level strategic foresight course with live case studies. She is a Visiting Fellow at Oxford University’s Saïd School of Business, a former Visiting Nieman Fellow at Harvard University, a Fellow in the United States-Japan Leadership Program and a Foresight Fellow in the U.S. Government Accountability Office Center for Strategic Foresight.

Regarded as one of the most important voices on the futures of technology (with specializations in both AI and biotechnology), Amy is the author of four award-winning books, including international bestseller *The Big Nine*, a sobering analysis of the future of AI, and *The Genesis Machine*, a detailed look at the future of bioengineering. To date, her books have been translated into 23 languages.

A widely published and quoted thought leader, Amy has appeared in publications and broadcasts including The New York Times, Fortune, Wired, The Atlantic, The Wall Street Journal, Harvard Business Review, MIT Sloan Management Review, the BBC, CNN, NBC and NPR, among others.

Amy attended the Jacobs School of Music to study classical clarinet. She holds a B.A. in political science, game theory and economics from Indiana University and an M.S. from the Columbia University Graduate School of Journalism. She is a competitive endurance cyclist.



**Melanie Subin**  
Managing Director

Melanie Subin is Managing Director at Future Today Strategy Group, serving on our management committee and leading our consulting division. Renowned for her pragmatic, forward-thinking approach, Melanie has successfully steered numerous clients toward future-ready strategies, harnessing emerging trends and technologies to identify risk and opportunity early enough for action. Her leadership has significantly impacted how industries envision and execute their long-term strategies.

Melanie specializes in strategic transformation, quantitative and qualitative research, and scenario development. With deep expertise in the development and establishment of foresight capabilities within large organizations, Melanie regularly counsels C-staff on strategy and execution. Melanie is also a recognized expert in fostering psychological safety within teams, a crucial element for operationalizing strategic foresight effectively.

Melanie serves in the World Economic Forum's Metaverse Working Group and is a founding member of the Dubai Future Forum's advisory group. She serves as a coach in the strategic foresight MBA course at the NYU Stern School of Business. Melanie holds a BS in Finance from Central Connecticut State University and a Fintech Certification from the Massachusetts Institute of Technology.



**Victoria Chaitoff**  
Marketing & Communications Director

Victoria joined FTSG with nearly a decade of professional experience in the media and entertainment industries. She most recently worked in public relations at Warner Music Group, shaping earned media strategy for a roster of award-winning artists and spearheading corporate communications for the Nashville division. Victoria also established WMG's annual company-wide day of service, an initiative that resulted in hundreds of volunteer hours dedicated to nonprofit organizations across North America. She holds a degree in English Literature from the College of William and Mary and a Master of Business Administration from New York University's Stern School of Business.



### **Nick Bartlett**

#### **Lead for Financial Services, Insurance, Transportation, and Manufacturing**

Nick Bartlett is a Director at the Future Today Strategy Group and leads our Financial Services & Insurance and Transportation & Manufacturing practice areas.

Prior to FTSG, he held positions in corporate strategy and insights generation roles, serving as a partner to senior leadership at multiple Fortune 100 financial services companies. Throughout his career, he has specialized in framework design, corporate innovation, strategic management, and insurance.

Nick has an extensive background in developing strategic insights across a variety of industries (e.g., manufacturing, transportation, construction, energy) and subject matter areas (e.g., small business, mobility, robotics, platforms & ecosystems), in addition to the shifting nature of business and consumer preferences. He has deep experience in developing and implementing both trend sensing, as well as signal identification for large organizations. Nick has also led the design and establishment of internal foresight and scenario development capabilities across multiple institutions.

He serves as a coach in the strategic foresight MBA course at the NYU Stern School of Business. Nick holds both an MBA and a Bachelor of Arts in Public Relations from Quinnipiac University.



### **Sam Jordan**

#### **Lead for Technology & Computing and Space**

Sam Jordan is a Senior Manager and the Technology and Computing Lead at FTSG. Her research focuses on the future of computing, spanning large-scale systems, personal devices, AI, and telecommunications. She also covers the space industry, analyzing advancements in satellite technology, communications infrastructure, and emerging aerospace innovations. She has worked with some of the world's largest technology companies to advance human-computer interaction, develop AI strategies, and drive innovation in device evolution.

Before joining FTSG, Sam was the CEO and co-founder of TrovBase, a secure platform for data discovery and analysis sharing. She also worked at IBM, where she helped large enterprises modernize their IT infrastructure, specializing in mainframes and integrating modern software and methodologies into legacy systems.

Sam currently serves as a coach in the Strategic Foresight MBA Course at NYU Stern School of Business and is an Emergent Ventures Fellow at the Mercatus Center. She holds a B.S. in Economics and Data Analysis from George Mason University and an MBA from NYU's Stern School of Business.



## Mark Bryan

### Lead for Built Environment, Hospitality, and Supply Chain

Mark Bryan is a Senior Foresight Manager at Future Today Strategy Group, leading the Built Environment, Hospitality, Retail, Supply Chain, Restaurants & CPG practices. Mark's portfolio of clients includes national foundations, global CPG companies, international associations, product manufacturers, international retail brands, higher education institutions, nonprofits, multi-family developers, supply chain organizations, healthcare systems, senior living facilities, restaurants, and large corporate clients.

In his work at FTSG, Mark has explored the future of communities, housing in urban settings, certifications and testing, product development cycles, parent and children's needs, digital interactions, supply chain and logistics, geographic cities, the workplace, immersive experiences, hotels and restaurants, design, manufacturing, urban planning, engineering, and artificial intelligence's impact on various industries and sectors. He has researched and developed hundreds of evidence-based trends, scenarios, and strategic insights for FTSG's global clientele.



## Sam Guzik

### Lead for News and Information

Sam Guzik is a Senior Expert Advisor specializing in the future of news, content, distribution and strategy. His career includes a broad range of experience that includes product management, strategic foresight, scenario forecasting, audience engagement and leadership in legacy news organizations.

Sam leads the product strategy for New York Public Radio. Passionate about building a sustainable future for local news, Guzik has demonstrated results creating innovative, engaging and impactful journalism — and thinking about the business model to support that work. His career includes a broad range of experience, with specific focus on product management, strategic foresight, scenario writing, audience engagement and leadership in legacy news organizations.

Sam is a graduate of Washington University in St. Louis, Columbia University Graduate School of Journalism and the NYU Stern School of Business.



**Marc Palatucci****External Relations Director**

Marc Palatucci is Director External Relations. He leads our Council of Forward Thinkers, which is our invitation-only community of experts, and our Associates Program. He also serves as lead coach in the strategic foresight MBA course at NYU Stern. He holds an MBA in Emerging Technology from New York University's Stern School of Business and a BA in Linguistics and Languages from NYU's Gallatin School of Individualized Study.

Marc is a published writer and serves as editor-at-large for an arts, fashion, and culture magazine.

**Andrew McDermott****Business Process Manager**

Andrew McDermott is a seasoned IT leader with over a decade of experience driving large-scale projects and fostering innovation through strategic initiatives. As a Manager of Business Process at Future Today Strategy Group, Andrew leverages his expertise in agile transformation, team leadership, and process optimization to help organizations streamline operations and implement cutting-edge solutions. His leadership spans the legal, energy, and financial services industries, where he has consistently delivered complex projects on time and fostered strong cross-functional collaboration. Andrew holds an MBA with a concentration in Leadership and Change from Queens University of Charlotte, and a Bachelor's degree in Computer Information Systems from Quinnipiac University. He is deeply committed to continuous improvement and regularly mentors emerging leaders in business and technology.



**Andrew Hornstra**  
AI Solutions Architect

Andrew is an AI Solutions Architect at Future Today Strategy Group. Prior to joining FTSG, he was the CTO for pinplanet, a travel-focused scrapbooking and social media app. He designed and built the platform’s backend and infrastructure.

Andrew has a background in software engineering and design, anti-money laundering, and fraud defense. He was the CTO and co-founder of TrovBase, a platform for secure data discovery and sharing analyses, where he designed and built the platform’s core software and infrastructure. Before TrovBase, Andrew was a Data Analyst at Capital One as an anti-money laundering model developer and an analyst working on bank fraud defense.

He holds a BS from George Mason University in Physics and Mathematics.



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# ABOUT FTSG



ABOUT US

Future Today Strategy Group is a consulting firm specializing in strategic foresight, a data-driven practice for developing plausible future scenarios to inform today’s decisions. As organizations across the globe grapple with an increasingly volatile and uncertain business climate, FTSG provides clarity through long-term strategic planning. Its team of subject matter experts combines best-in-class trends and technology research with actionable strategies to generate business impact. In the two decades since its founding, FTSG has become the preeminent foresight advisory to Fortune 500 companies, world governments, and other major organizations—empowering leaders to make better decisions about the future, today.

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Future Today Strategy Group employs a rigorous, research-driven methodology to identify and assess emerging trends. Our approach integrates qualitative and quantitative analysis, drawing from a diverse set of data sources, including patent and trademark filings, scientific literature, investment flows, macroeconomic indicators, regulatory developments, media discourse, and digital engagement patterns. We leverage our proprietary system to detect and map weak and strong signals, clustering them into thematic nodes and evaluating them against standardized criteria. Once trends are qualified, each trend is further assessed for trajectory, momentum, and timing, ensuring a structured and forward-looking perspective.

To enhance analytical depth, we engage a network of subject matter experts, industry leaders, and researchers, refining insights that provide actionable intelligence.

Since 2007, FTSG's annual report has provided a structured lens on industry and technology trends, offering executives a strategic view of how emerging developments are reshaping sectors and value chains. Industry trends explore systemic shifts impacting businesses and markets, while technology trends focus on the evolution of specific innovations. Our research spans multiple industries, ensuring a holistic view of transformation and disruption.

We systematically track and update these trends to help organizations anticipate risks, seize opportunities, and develop resilient strategies. By providing clarity amid uncertainty, we equip leaders with the foresight necessary to navigate an era of accelerating change.



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