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TechnoVision: Top 5 Tech Trends to Watch in 2025

Paris, November 27, 2024 – Capgemini unveiled today its 'TechnoVision Top 5 Tech Trends to Watch in 2025', focused on the technologies that are expected to reach an inflection point in the next year. The focus on AI and generative AI (Gen AI) is shared both by executives around the world as well as by the venture capital professionals that were interviewed in a global survey to be published at CES in January 2025. It is anticipated to also have a significant impact on other key technologies which are likely to reach a stage of maturity or breakthrough in 2025.

"*Last year, Capgemini's Top 5 Tech Trends predicted the emergence of smaller Gen AI language models and AI agents, both of which came to fruition. We also signaled the importance of Post-Quantum Cryptography, confirmed by the publication of the National Institute of Standards and Technology's standards last summer. And as anticipated, semiconductors have been at the center of attention in 2024 with significant evolution driven by the massive use of AI and generative AI, as well as shifts in market dynamics,"* explains Pascal Brier, Chief Innovation Officer at Capgemini and Member of the Group Executive Committee. "*In 2025, we see AI and Gen AI having a major impact on companies' priorities and also on many adjacent technology domains, such as robotics, supply chains or tomorrow's energy mix.*"

Technologies to watch in 2025:

1) Generative AI: From copilots to reasoning AI agents

Generative AI is now entering the dawn of agentification where AI systems are evolving from isolated tasks to specialized, interconnected agents. In fact, according to a Capgemini Research Institute survey of 1,500 top executives globally, which will be published in January 2025, 32% of them place AI agents as the top technology trend in data & AI for 2025.[1] Thanks to the increasing capabilities of logical reasoning in Gen AI models, these will start operating more autonomously while providing more reliable, evidence-based outputs, and will be able to manage tasks such as supply chains and predictive maintenance without constant human oversight. AI systems can handle dynamic decision-making in more sensitive environments where correctness is paramount. The next step will be the rise of a superagent, an orchestrator of multiple AI systems, optimizing their interactions. In 2025, these advancements will enable new AI ecosystems across industries, allowing new levels of efficiency and innovation.

Why it matters: With the maturation of AI models, transformer models and other Gen AI architectures have reached new levels of sophistication and accuracy, making multi-agent systems viable for real-world, complex, dynamic decision-making, even in unpredictable situations. This is set to unlock greater potential in industries that rely on quick, flexible responses to unexpected challenges, such as healthcare, law, and financial services.

[1] Capgemini Research Institute, Top Tech Trends report 2025, to be released in January 2025. Survey of 1,500 senior executives and 500 VCs in 15 countries in Europe, Americas and APAC in September-October 2024.

2) Cybersecurity: New defenses, new threats

AI is transforming cybersecurity, enabling both more sophisticated Gen AI-enhanced cyberattacks and more advanced AI-driven defenses to the point where almost all organizations surveyed (97%) in the recently published Capgemini Research Institute's report say they have encountered breaches or security issues related to the use of Gen AI in the past year. In recent years, with remote work, companies now face a larger attack surface and greater vulnerability to these threats. In fact, 44% of top execs in the upcoming Capgemini Research Institute report place the impacts of Gen AI in cyber as the top technology topic in cybersecurity for 2025. To mitigate these risks, there has been renewed investments and innovations in endpoint and network security, increased efforts to automate threat detection, especially using AI-driven threat intelligence, as well as an effort to prepare for the future by reinforcing encryption algorithms, in particular the growing interest into Post-Quantum Cryptography to protect against the next expected disruption: quantum-computing threats. This shift marks a broader transformation in how businesses approach security and build trust in their increasingly autonomous systems.

Why it matters: In 2025, generative AI-powered cyberattacks will continue to be more sophisticated and widespread, increasing risks for organizations. In parallel, as AI plays a larger role in decision-making and operational control, ensuring that humans trust these systems will become crucial. But it's not just about being safe—it's about feeling safe. Cybersecurity must address both technical and psychological concerns, ensuring not only protection but confidence in the systems people rely on daily.

3) AI-driven robotics: Blurring the lines between humans and machines

Advancements in AI technology have accelerated the development of next-generation robots, building upon innovations in mechatronics and expanding beyond traditional industrial uses. While robotics used to be dominated by hard-coded, task-specific machines, the development of Gen AI is spurring the development of new products (including humanoid robots and collaborative robots - or cobots) that can adapt to diverse scenarios and learn continuously from their environment. According to the Capgemini Research Institute's upcoming report, 24% of top executives and 43% of Venture Capitalists see AI-driven automation and robotics as one of the top 3 tech trends in data and AI in 2025. With robots becoming more autonomous and AI taking on complex decision-making roles, the future of work may see a shift in the traditional structure of authority. The rise of AI-powered machines that mimic human behaviors challenges our understanding of leadership, responsibility, and collaboration, ultimately pushing us to reconsider the role of humans.

Why it matters: As Industry 4.0 progresses, AI-powered robots will drive efficiency, flexibility, and innovation, becoming key components of intelligent, connected systems that redefine industrial processes. By 2025, advances in natural language processing and machine vision will further enhance their capabilities, allowing robots in manufacturing, logistics, and agriculture to take on more complex roles within the modern workforce.

4) Nuclear: The surge of AI driving the clean tech agenda

The energy industry is in the midst of a transformative shift, with the energy transition accelerating at an unprecedented pace. This change is fueled by mounting pressure to fight climate change and supported by rapid innovations across various sectors, from renewables and biofuels to low carbon Hydrogen and beyond. Nuclear energy stands out as a focal point for 2025: nuclear is re-emerging at the top of the business agenda, propelled by the urgent need for clean, dependable and controllable power that can support the rising energy demands of AI and other high-energy technologies. Although in September/October 2024, very few top execs globally

identified Small Modular Reactors (SMRs) as a top 3 Sustainability technology for 2025, SMR technology development is expected to accelerate by 2025, and other key innovation priorities include strides toward limitless, clean power with nuclear fusion, or Advanced Modular Reactors that differ from light water reactors in the use of new types of fuels and a higher temperature and for some of them the promise to reduce the production of nuclear waste.

Why it matters: Driven by the massive energy demands of AI, major tech players are turning to nuclear energy to meet their growing computing needs. Large-scale investments are expected to further accelerate innovation in reactor technology and waste management, as the tech industry acknowledges that renewables alone cannot sustain its energy demands.

5) New generation supply chains: Agile, greener and AI-assisted

In the last few years, businesses have had to navigate increasingly complex, unpredictable market conditions. Key technologies including AI, data, blockchain, IoT and connectivity with Terrestrial Satellite Networks are now playing a strategic role in improving the cost efficiency, resilience, agility, circularity, and sustainability of supply chains. These technologies are allowing companies to enhance their predictive capacities and navigate an ever-changing ecosystem as they have now reached a sufficiently high level of maturity and therefore reliability. Meanwhile, progress in space techs such as low-earth orbit satellite constellations is particularly essential to increase coverage in white spots which is crucial for companies to be able to control their entire supply chains throughout the globe. In fact, according to the Capgemini Research Institute's upcoming report, 37% of top executives see these new-generation supply chains powered by technologies as the top tech trend in industry and engineering in 2025. Additional regulatory and environmental constraints will make this shift all the more critical to ensure competitiveness, agility and resilience.

Why it matters: In 2025, global supply chains will keep facing environmental disruptions, regulatory pressures, and geopolitical tensions which will impact the flow of goods and raw materials. New regulation like the European Union's Digital Product Passport will make it mandatory for companies to track and disclose the environmental footprint of their products, pushing them to adopt more sustainable practices.

Beyond 2025 - technologies shaping the next 5 years:

1) Engineering biology: biosolutions to today's most pressing challenges

While the potential of engineering biology and its ability to transform manufacturing, develop drugs and produce materials with novel properties has been widely discussed over the past years, this technology is yet to reach its scaling phase. According to the Capgemini Research Institute's upcoming report, 41% of top executives believe that molecular assembly will reach maturity and become commercially viable by 2030. Meanwhile, 37% of them envision the same for Genomic Therapies. In the coming years, we can look forward to new innovations in this diverse field, such as personalised mRNA vaccines and GenAI for protein design.

2) Quantum computing: on the verge of the quantum leap

According to the upcoming Capgemini Research Institute survey, 55% of top executives and 44% of VCs expect quantum computing to be one of the top 3 technologies within the 'Computing & Networking' space which will create a major impact in 2025. 41% of top executives expect to be experimenting with quantum computing Proofs of Concepts with limited use cases, and 27% of the top executives surveyed expect the technology to be

partially scaled in some parts of the organization in 2025. The key question is – when will the quantum leap happen, and who will master it?

3) Artificial General Intelligence: I think, therefore AI am?

AI reasoning capabilities have made spectacular progress over the past 5 years, and some predict an era of artificial general intelligence (AGI). As such, 60% of top executives and 60% of VCs surveyed by the Capgemini Research Institute believe this technology will reach maturity and become commercially viable by 2030. Would this technology basically be able to mimic human intelligence to the point of making it irrelevant? This topic leads to exaggerated predictions, and some now question whether the intelligence potential of the technology is really unlimited.

TechnoVision 2025

TechnoVision is a global program from Capgemini articulating a comprehensive view of the world of Technology to help leaders make technology-driven business transformation decisions. It is guiding decision-makers through the myriad of emerging technology trends, to focus on those which will make their organization more effective. Capgemini's Top 5 Tech Trends report and its CTIO TechnoVision playbook will be published in January 2025.
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