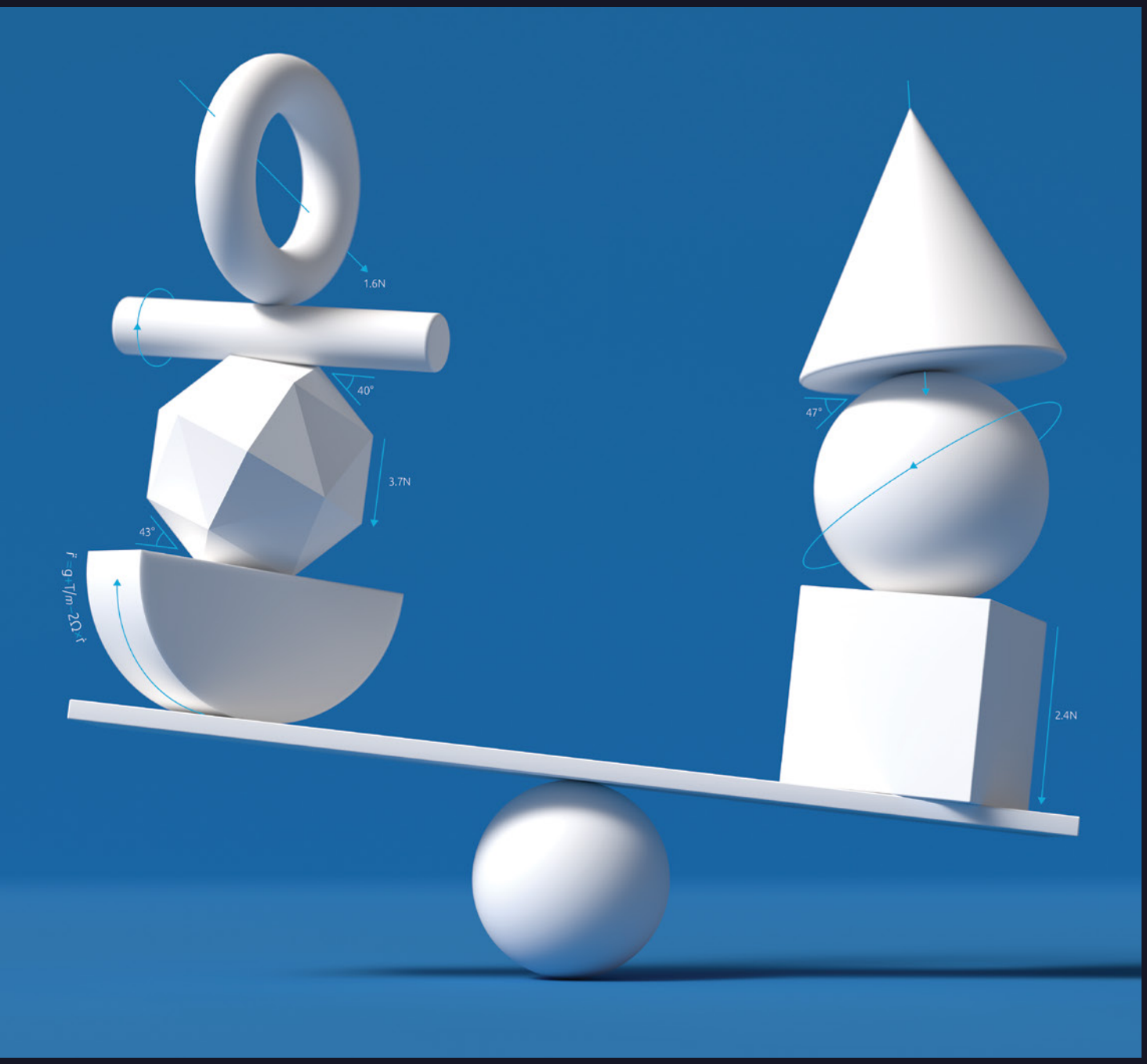
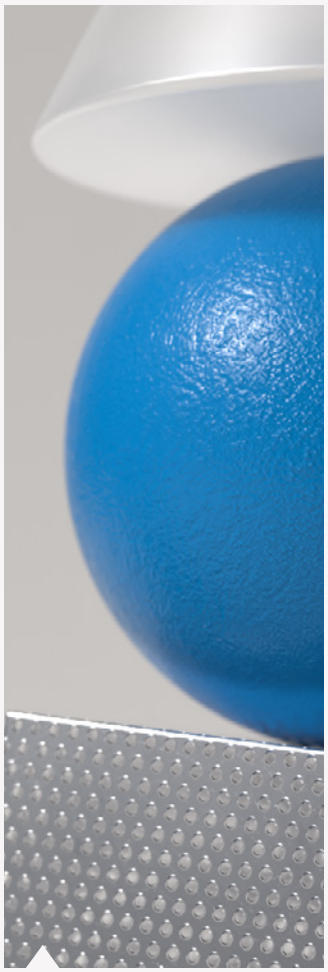


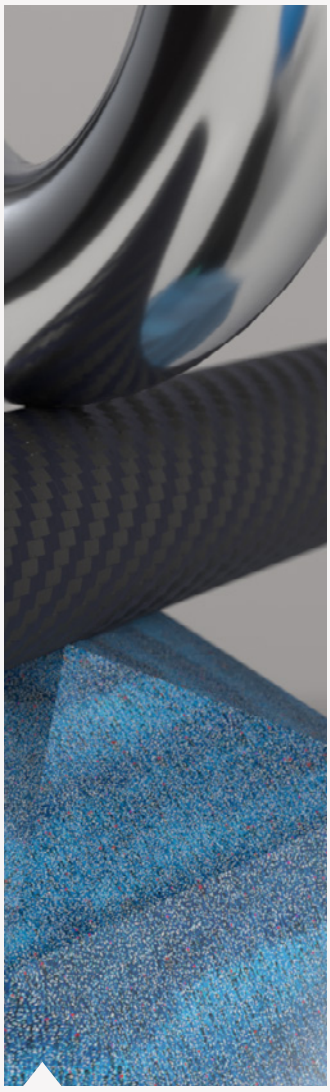
Techno Vision 2025

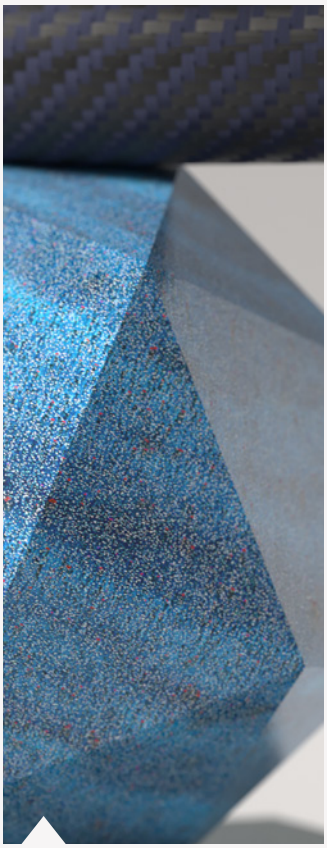
Aerospace and Defense

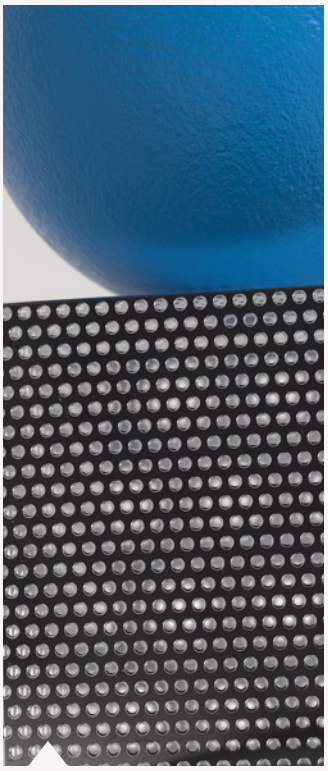
Capgemini

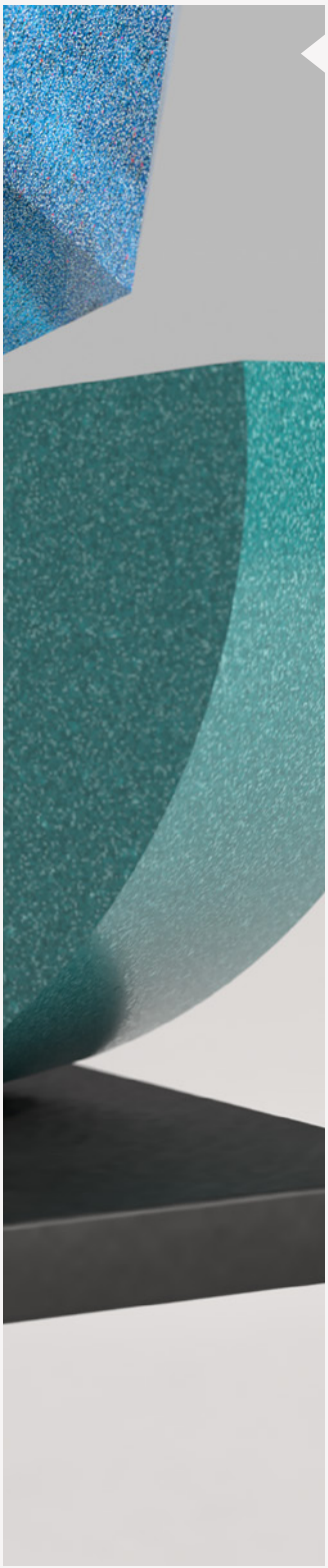
Table of Contents











Foreword

Patrice Duboé
CTIO, Aerospace and Defense

Artificial Intelligence (AI), generative AI, Quantum, Digital Twins, Virtual Reality, and many more technologies are making the headlines. But what does it mean for you, for your team, for your company and for your clients? We created TechnoVision 16 years ago to share our vision of technologies and identify their benefits for our clients. This vision is just the first step, technologies and innovation have to be applied in real projects and programs before being deployed at scale on the enterprise level. Moreover, the maturity and impact of technologies will be different depending on the industry.

I'm very pleased to present this updated TechnoVision 2025 report, dedicated to the Aerospace and Defense industry. With our expert teams, we have identified not only our vision for the coming years but also the best use cases deployed all over the world within the industry. I invite you to connect with our Aerospace and Defense Top Guns to see how you can implement some of these innovations within your context.

Civil aeronautics is embracing a radical shift to clean energies while transporting more and more passengers every year. Electrical aircraft, drones, and eVTOLs, we are seeing new ways of flying emerge. Space has become a mature industry delivering services to all other industries worldwide, mainly with New Space optimizing the Low Earth Orbit and providing services used by each of us every day at a very low cost. We use GPS/GNSS while driving, cycling or running. We can be connected from everywhere through thousands of satellites and can use data from Space to better monitor and save our planet. Last but not least, even more this year, geopolitics has given defense a brand-new role to protect countries and citizens, with digital playing a major role in exploring new innovations.

As you navigate through the report, you will discover in the You Experience container, how the Experience² trend is supporting digital continuity, a de facto standard in civil aeronautics. Next, you will enter the Economy of Things trend, exploring how new satellite constellations in Low Earth Orbit are providing brand new services to improve the supply chain for worldwide industry leaders or armed forces deployed globally. Capgemini has been implementing a Digital Twin for an Aerospace and Defense OEM with an objective to optimize lead time and development cost. I invite you to discover the associated demonstrations available to you via a visit to one of our Applied Innovation Exchange spaces.

And finally, why not learn how to do more with less exploring the Do Good, Do Less, Do Well trend?

The aerospace industry has embraced the Net Zero target, but achieving sustainability requires new strategies, involving trade-offs between performance and carbon impact. NATO has been illustrating the Data Sharing is Caring trend to manage the massive volume and diversity of data within a complex international ecosystem to improve collaboration, standards, and extract data value. But of course, these are only four out of the 37 trends included in this report!

I hope you enjoy reading this report as much as we did writing it.

3,2,1 Ignition!

Introduction

Lee Annecchino
Global Industry Lead, Aerospace and Defense

Welcome to the second edition of TechnoVision for Aerospace and Defense! We launched the first-ever TechnoVision for the A&D industry in June 2024, and we are excited to bring you a fresh perspective based on the updated themes and insights from Capgemini's TechnoVision 2025 launched earlier this year. Our subject matter experts are excited to share with you their perspectives on how the report's insights apply specifically to the A&D industry. They have also included 37 A&D specific use cases throughout.

If you look at the cover of this year's TechnoVision, you'll see a pendulum. That swinging pendulum reflects the fluid balance required to achieve optimal results. With regards to technology, the pendulum signifies the ongoing struggle of advancement towards what's possible and the need to address today's realities.

Across industries we see innovation moving at a rapid pace. These new technologies enable us to address today's urgent business priorities more quickly and efficiently, setting the foundation for a stronger future. AI and Gen AI are accelerating innovation across the aerospace and defense industry at a pace few anticipated. From predictive maintenance and autonomous systems to mission planning and threat detection, AI is enhancing operational efficiency and decision-making. Gen AI, in particular, is emerging as a powerful tool for simulating complex scenarios and assisting in the design of next-generation aircraft and defense systems. As these technologies mature, they are poised to redefine the boundaries of what's possible throughout aerospace and defense.

Every industry has their challenges, and A&D is no exception. Production demand continues to grow while manufacturing capacity, along with a fragile supply chain, continues to plague, threatening time to market, customer deliveries and financial results. Geopolitical issues continue causing further uncertainty impeding strategies for growth. The challenge of sustainability is omnipresent as the industry moves closer to looming deadlines for restricting CO2 emissions and building a more circular economy throughout the ecosystem. And the human element cannot be lost in the speed of innovation. Behind the drive and implementation of innovation are the humans creating ideas and implementing the solutions. While we have seen some changes since the publication of the first A&D report, the industry continues to grapple with many of the same business priorities as it did a year ago. So, our approach to this year's report was to provide a fresh update on how these trends continue to impact A&D. We included:

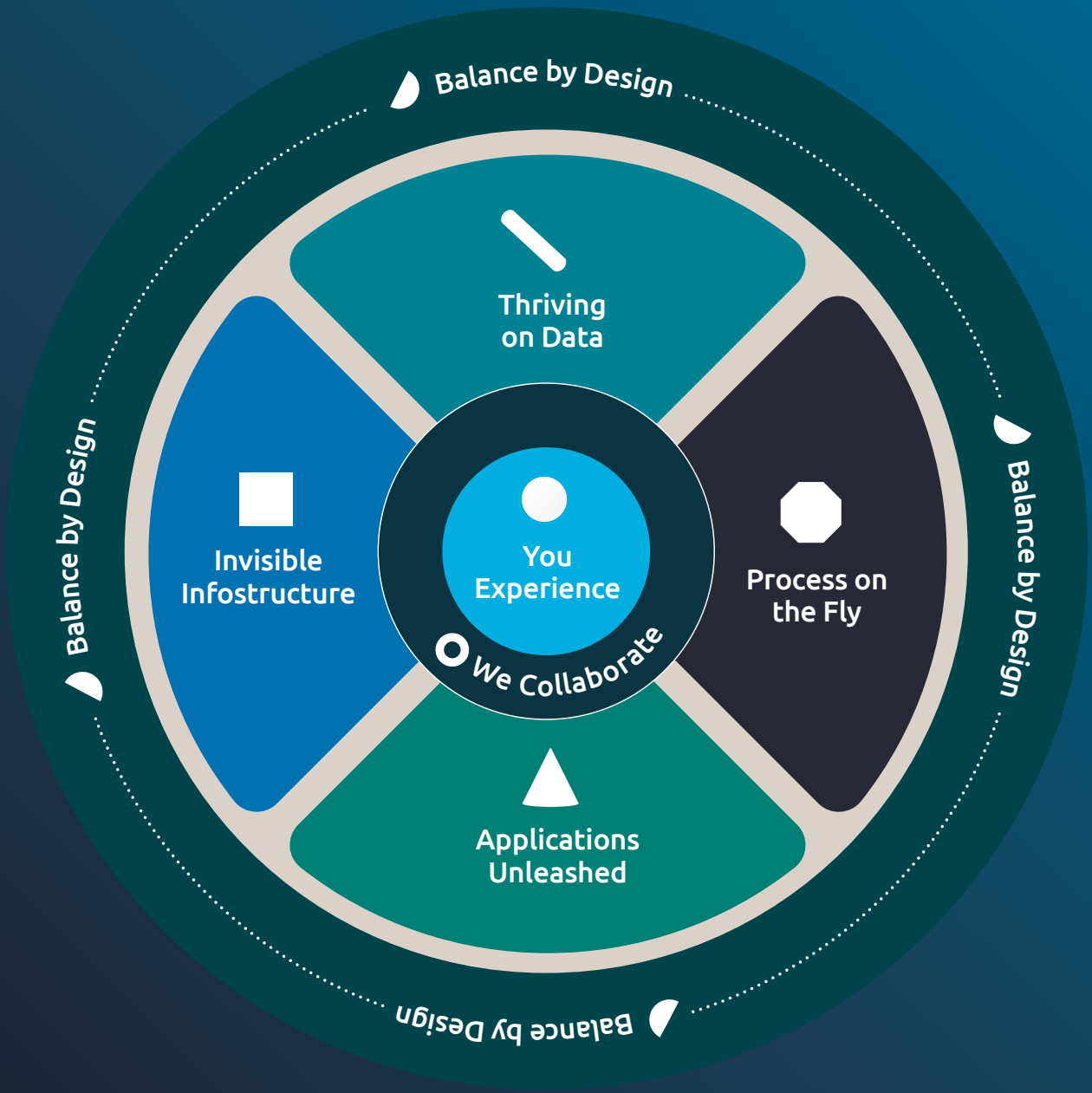
- 13 new chapters
  - We re-examined the 37 trends outlined in last year's TechnoVision report, including 13 new trends for 2025.
- A use case per trend to illustrate how the trend is being implemented today.
- "A few more things…" for civil aeronautics, defense, and space.
  - We are closing this year's report with an expert point of view for each of the industry sectors, each analyzing the impact of innovation within their sector and looking forward to what may lie ahead.

TechnoVision challenges us to think about technology as a pendulum… a balance between what is and what can be. So, join us again this year to explore this industry-specific guide to the emerging trends impacting the strategic decisions of today, and what that means for planning ahead for tomorrow.

Overview of TechnoVision

TechnoVision categorizes technology trends into seven 'containers', the first six providing a snapshot of innovation from different perspectives: the 'what' — ranging from user experience and collaboration, via data and process automation, all the way to infrastructure and applications. A seventh container captures a series of overarching design principles to successfully apply the trends and create transformational impact: the 'how'.

These principles help to build a sharp mindset, ready to apply to any portfolio, program, project, architecture, innovation initiative, or idea.



You Experience or trends in user experience and We Collaborate or trends in collaboration are at the very heart of technology-powered change. This core foundation is surrounded by four enabling containers: Thriving on Data or trends in data and AI Process on the Fly or trends in process automation and management, Applications Unleashed or trends in applications, and Invisible Infostructure or trends in infrastructure. The collection of trends is all wrapped up with Balance by Design or trends in design principles, as the overarching container to always be considered while working with the others.

Containers

While trends change over the course of the years — some of them are newly introduced in a year, others disappear, yet others stay — we find the containers make up a stable, dependable foundation to discuss and assess a digital landscape. The names of the containers are aspirational. They suggest a desirable yet always evolving state to be strived for; in a way, they are self-explanatory. The user experience becomes a true You Experience, when it is optimally tuned to the expectations, objectives and context of its users. When collaboration is jointly owned and embraced by all stakeholders in a teaming effort, it's where we want to be with the trends in We Collaborate.

These days, it's not so difficult to point out the transformative power of data and AI, but only when true data mastery is achieved in all parts of the organization, it's Thriving on Data. When a process is a Process on the Fly, it is not only easy to configure and modify, it also perfectly enables the needs and flows of the organization. Liberating applications in Applications Unleashed has two sides: freeing organizations of the burden of inflexible, outdated applications, but also benefiting from a new generation of agile, smart application services.

Within Invisible Infostructure (IT), there is always the quest of turning infrastructure into a more seamless, trouble-free utility, while capturing and providing more data and connectivity from more diverse places. Finally, the principles of Balance by Design, stimulate a perpetual effort to balance the different success and fail factors of change, not as an afterthought but integrated into all strategic, architectural, design and solutions development efforts. Every container kicks off with an overview page, consisting of four sections: the Where We Are, more or less an expression of the state of the nation of the container, Balancing Act, building on TechnoVision's main theme of this year, it explores the different dynamics within the container, New Trends, which introduces this year's new trends in the container, and finally 3 Steps To Take, suggestions for actionable follow-up.

Trends

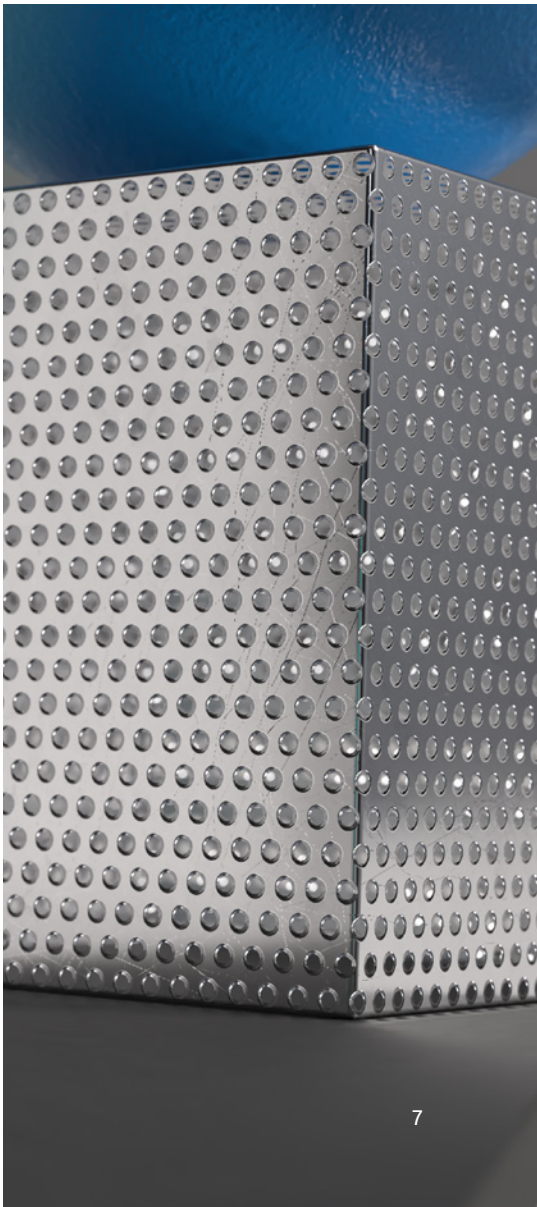
Within each container, five key trends are presented as one-page summaries, designed to be crisp and to-the-point, yet appetizing enough to warrant further study. They all feature a What section that describes the trend, a Use section with best practices and use cases, an Impact section that exemplifies the change potential of the trend, and a Tech section that provides links to key technologies and standards. Each trend also mentions an Expert in Residence with whom anyone can connect if they want to know more about the topic.

Balance by Design follows a slightly different setup from the other six, presenting views of how to balance within an organization using seven clear design principles — including anti-principles that are remarkably often easier to detect than the principles themselves.

Playful

As will be obvious from some of the trends above, our authors have stayed true to the playful nature of TechnoVision by using references to rock, pop, movies, and other cultural and societal phenomena. It turns out this playfulness makes the trends more accessible, more compelling, and easier to remember. Also, as our authors will testify, it's good, clean fun creating these headings. Although we acknowledge that the understanding of references and wordplay will differ — depending on age and country of residence — readers are challenged to find as many of these 'Easter Eggs' as possible. The TechnoVision Expert in Residence community caters to a variety of detailed posts and articles about your favorite 37 building blocks.

We encourage you to read the accompanying report Applying TechnoVision for various means of using and playing with TechnoVision in a unique and entertaining way. Finally, to dive even deeper into the TechnoVision universe, watch out for the industry playbooks: released throughout the year as they provide numerous sector cases and best practices, positioned within the TechnoVision framework.



You Experience

- Face to Interface
- I Feel for You
- Internet of Twins
- No Experience
- You're Something Spatial

Alexandre Embry

We need more natural interfaces and better human-machine understanding. Technology should adapt to users, not the other way around.

Face to Interface

What

Face to Interface is about adding a human touch to digital content - making digital interactions feel more personal by using human-like features. It's most relevant in business-to-business (B2B) and business-to-consumer (B2C) contexts to improve customer experiences and interactions. With the introduction of agentic systems, there is a need for new ways to interact with digital content, such as digital twins and immersive experiences. The closer these interactions are to human-like experiences, the more likely users will adopt and use them.

A simple example is a chatbot. If we add a human face to these interfaces, it becomes harder to tell if it's AI or a human, making the interaction more natural and powerful. In civil aeronautics, this trend can improve in-flight experiences for travelers, who could interact with entertainment systems via a conversational and human-like interface. In defense, agents could prompt signal processing personnel about a subtle but important sequence they may have missed.

AI is everywhere and represents significant technological progress. Fostering adoption of these new technologies is key as it helps people interact more naturally, bringing in balance to businesses. Enabled by multi-model AI, chatbots and agents can work with us, nudging us in the right direction via newfound interactions. No longer are we bound by the keyboard and mouse, clicking for results.

Impacts

In the short term, the focus is on adoption by making technology usable and bringing value to users' everyday jobs. In the long term, technology will continue to evolve, leading to more advanced interactions.

It's crucial to put humans at the center of this digital landscape, with increasingly natural interfaces and human-machine understanding, to avoid a lack of traction. Technology should adapt to users, not the other way around. The goal is to ensure interactions are frictionless and frustration-free.

One of the biggest challenges this trend faces is building trust. Creating trust in AI interactions is crucial, and adding a human face and emotional connection can help address this. However, users may still feel they are interacting with a machine, as nothing comes quite as close to real human interactions. Overcoming these challenges involves proving that the system's responses are correct and accurate. This depends on how well the AI model is trained and the quality of the data used. Agentic systems can help by focusing each agent on a specific sub-domain, reducing the risk of using unnecessary data and ensuring accurate results.

Use case

The conversational AI use case goes a step further when tied into smart devices. Tools like AI avatars on smartphones or wearable glasses are already surfacing—able to scan the environment, recall contextual information, and offer timely reminders. In Aerospace and Defense (A&D), this could translate into AI agents reminding crew members of task updates, suggesting rescheduling based on mission timelines, or surfacing relevant instructions before a maintenance check. It's all happening quickly and quietly, changing the face of the standard toolkit—just as long as it's implemented securely and ethically.

Alexandre Embry

Enabling and supporting both the individual and corporate EQ, by creating a more effective, meaningful, and satisfying symbiosis between people and their technology enablers.

I Feel For You

What

The emotional aspect of the experience layer is paramount, drawing from insights into Customer Experience (CX). And in today's world, as the pendulum swings across geopolitical, economic and global efforts, now more than ever, it's evident that empathy and emotional connection are vital for user engagement. Even as we consider these global shifts in tandem with the virtual environments and immersive technologies we work in, maintaining this emotional connection remains crucial. Creating this human-like interaction within virtual environments is essential for enhancing user experience and driving adoption.

Users should feel a genuine sense of connection and empathy, akin to interacting with a human colleague, as far as possible. This emotional dimension is what bridges the gap between virtual and physical interaction, making the user experience more immersive and fulfilling.

Impact

As AI continues to advance, it will inevitably impact various aspects of user interaction and engagement. One significant application is the concept of virtual advisors, particularly relevant in manufacturing activities within Aerospace and Defense. To leverage the guidance and support offered by virtual agents effectively, establishing an emotional connection is key. Virtual advisors can be designed to recognize and respond to user emotions through the use of sophisticated algorithms and machine learning techniques. By analyzing facial expressions, tone of voice, and choice of words, these AI-driven entities can provide empathetic responses, mirroring the emotional intelligence of a human advisor.

Additionally, virtual advisors can be programmed to offer personalized interactions, remembering user preferences and past interactions to build a rapport over time. This personalized touch not only fosters a sense of familiarity and trust but also ensures that users feel understood and valued. Through continuous learning and adaptation, virtual advisors can refine their emotional engagement strategies, increasing their effectiveness in creating meaningful and satisfying user experiences.

Use Case

Capgemini supports OEM, in its Flight Operations & Air Traffic Management Digital Solutions dedicated to airlines, airports, and Air Navigation Service Providers (ANSPs). The objective is to bring Digital, Product Owners functional expertise to support the OEM in developing its solutions dedicated to airlines, airports, and Air Navigation Service Providers and lay down a roadmap for the deployment of solutions for their clients. Capgemini works to support key resources through four main work packages:

- **Project Managers:** Lead deployment projects to ensure on time, on cost and on quality implementation of the products within their customers ecosystems and the ebbs and flows which occur.
- **Business Analysts:** Perform the technical tasks required to ensure the proper implementation of the products within the OEM's customer global ecosystems.
- **Product Owners:** Turn the business/ operational needs collected with Product Management into user stories and work closely with the development team to get these user stories properly implemented.
- **Product Application Specialists:** Provide expertise and technical support on the products, specifically providing accurate answers to the customer

The target outcomes are improved customer experience, clarity on the solutions and deployment plans for the OEM's clients, easing customer operations and increasing customer visibility. All of this in the plains that our global pendulum swings.

Pierre-André Vandelle

Digital Twins — virtual representations of real-world entities and processes — deliver better mastery of real-world challenges, with less strain on resources and energy.

Internet of Twins

What

The Internet of Twins is recognized as a significant game changer and a powerful facilitator of decision-making processes at all levels of an enterprise. By leveraging Digital Twin technology and Internet of Things capabilities, organizations gain a clear understanding of current situations, evaluate potential scenarios, and receive guidance on the best course of action. This is especially true in the current uncertain times, where key decisions must be taken based on facts to provide competitive positioning in a more challenging market than ever.

For example, Digital Twins help qualify market changes and ensure early design of new generation products meet top-level requirements more swiftly, particularly relevant in defense when reacting to ongoing global conflicts. In aerospace, Digital Twins can facilitate the integration of engineering and manufacturing processes through complex simulations enriched with real parameters coming from the field. This integration allows for more efficient production planning right from the design stage, significantly speeding up the manufacturing of complex products like an aircraft.

Additionally, advancements such as optimization techniques and AI contribute to the evolution of Digital Twins into intelligent systems, capable of effectively managing complexity and providing valuable insights for decision-makers. With the emergence of agentic AI, engineers designing via 2D or 3D modeling can use agentic AI to provide real-time conformity status of the modelled design. Limiting lead time between a possible defect introduction in design and the defect detection time that can come very late in the process.

Furthermore, the integration of cloud hosting and secure data analytics enhances collaboration among stakeholders and enables a comprehensive, model-based approach to decision-making, starting from the early stages of product development.

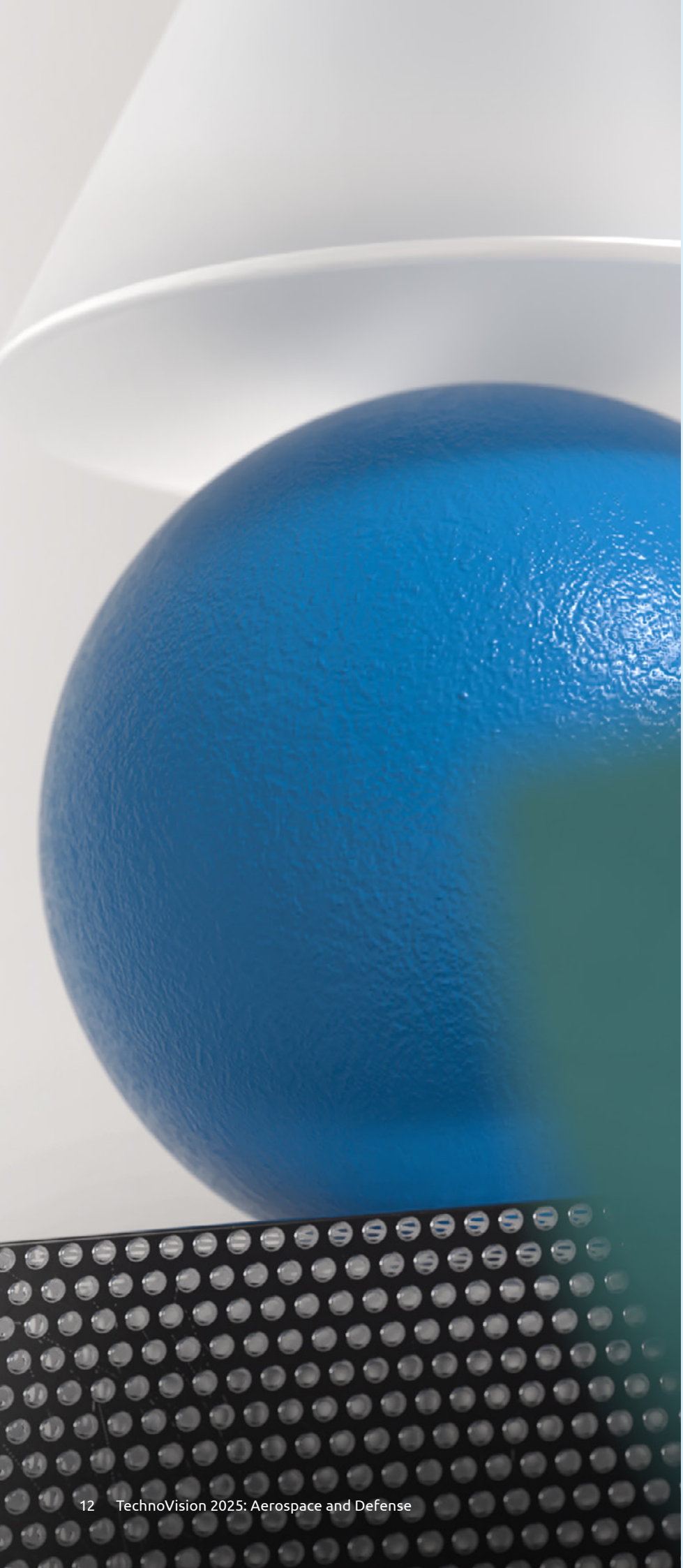
In recent years, we observed a major shift in the consumption of Digital Twins. They are not only used to reproduce behaviors of complex systems by reinjecting real data into specification models, but also as a temporary solution able to secure specific architecture or design points by coupling models, simulation and real data. We can consider Digital Twin as a Service as a new way of digital twin consumption by players in Aerospace and Defense.

Impact

The current trend emphasizes the need for a continuous interplay between the operating model, skills, leadership, and digital enablers. This approach isn't just about adopting new tools or infrastructures; it involves fostering more collaborative processes that allow personnel from various functions to work together effectively. It also requires equipping people with the necessary skills to operate in a data-driven, digital context and to find the right digital solutions that can support complex engineering environments. It's crucial to employ a dual-level approach: demonstrating tangible benefits at the operational level through targeted use cases that address specific pain points, and simultaneously developing a long-term strategy that fundamentally reshapes organizational practices by integrating people, processes, and digital tools.

This dual-level approach ensures that substantial investments in these technologies are made in areas where they can deliver the most value. Furthermore, these technologies play a crucial role in attracting young talent by creating attractive, digital, and dynamic work environments that appeal to skilled engineers. This shift is becoming essential, as attracting top talent is now seen as a critical component to maintaining competitive advantage and operational excellence.

Digital Twins must be further systematically integrated into the development plan to secure complex systems architecture, design, manufacturing and operations.



Major digital transformation programs over the last 10 years did not focus enough on the way integration, verification and validation stages can be optimized: it can nonetheless represent up to 60% of engineering lead time in some cases. Digital twins, here again, must be considered as a tangible option to pre-validate complex designs and act as a pre-verification means to avoid costly late defect detection.

Use Case

Capgemini implemented a Digital Twin for an Aerospace and Defense OEM with an objective to optimize lead time and development cost. The solution included a two-tiered approach:

- **Co-development:** The product and its industrial system include operations and services modelled in a virtual environment, until best-in-class is achieved.
- **Analytics, execution and services:** Collecting real time data helped to tie back the physical twin to its digital avatar enabling improved products, manufacturing and services through anticipation and preventive actions.
- **Market qualification:** Model company environment, new and future technological trends, impacting parameters evolution to identify key performance items to fulfill in the future.
- **Innovation factory accelerator:** Model innovating technology integration into products to anticipate their future performance while evaluating the ability of the organization and supply chain to support development of a technological breakthrough.

Observed results:

- Set of specific industrial Digital Twin use cases defined and capitalized.
- Prioritized use cases according to the defined strategic product program roadmap.
- Direct reduction of Recurring Costs (RC) and Non-Recurring Costs (NRC) per factory.
- Reduced development lead time contribution.

Alexandre Embry

Generative AI and immersive technologies bring controller-less interactions and the merger of the physical and virtual worlds, leading to a natural, intuitive, and stress-free experience of technology; like there is no experience at all.

No Experience

What

One significant aspect is the emergence of advisors, a novel trend that will significantly impact the You Experience container. This entails incorporating visualization and collaborative interaction layers into the overall experience mix, catering to employees, engineers, customers, and industrial processes. The focus is on enhancing and preparing for the User Interface (UI) of the future, shifting towards natural interaction.

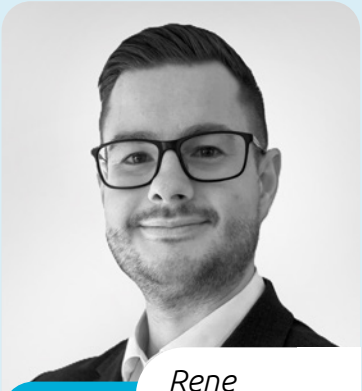
Impact

This trend is largely facilitated by devices like Apple Vision Pro or Meta Quest. These devices seamlessly blend virtual reality and augmented reality, allowing users to experience immersive content while remaining connected to reality. This innovation is poised to have a profound impact on experiences, particularly in training and learning scenarios.

Traditionally, immersive training sessions using purely virtual headsets have been limited, as users often find it challenging to remain fully engaged for extended periods. However, with these new devices, we're seeing improvements that address this issue, enhancing the overall training experience. Additionally, the integration of AI and Gen AI into this trend introduces the concept of spatial AI, where users interact not only with human colleagues but also with virtual agents or advisors. Newer devices like the Orion prototype from Meta give a sense of how this space is evolving from video passthrough to pure augmented reality.

Use Case

Jeh Aerospace, an Indian startup specializing in precision aerospace manufacturing, is integrating GridRaster's spatial AI and AR/VR technologies to enhance training, inspection, and productivity in aerospace manufacturing.



Rene Schlepphorst

The convergence of spatial computing, digital twins, and real-time 3D is transforming industries with immersive, personalized, and sustainable experiences.

You're Something Spatial

What

The evolution of spatial technologies in defense is driven by the need to modernize data access, decision-making, and readiness. While early use focused on virtual training, advances in spatial computing, digital twins, large vision models, and real-time 3D now support damage assessment, predictive warfare, and autonomous reconnaissance.

Russia's invasion of Ukraine marked a turning point, accelerating AI adoption in military planning. The U.S. Army's Integrated Visual Augmentation System (IVAS) integrates AR with night vision and target recognition. These kinds of innovations reflect a broader geopolitical shift—even in traditionally cautious nations like Germany, modern technologies like AI are now seen as essential for maintaining strategic parity.

Impact

Spatial computing evolves from static Virtual Reality/Augmented Reality (VR/AR) applications to dynamic systems that analyze physical environments in real time and adapt digital overlays contextually.

These technologies are reshaping military operations across three dimensions:

1. **Predictive Warfare:** Digital twins of military assets (e.g. tanks, drones, etc.) simulate not only individual components but entire operational scenarios, factoring in enemy actions and supply bottlenecks.
2. **Autonomous Reconnaissance:** Large vision models (LVMs) enable zero-shot recognition, identifying camouflaged targets in satellite imagery with 92% accuracy. Drones with multimodal sensors detect underground caches, reducing analyst risk.
3. **Collaborative Command:** Holographic sand tables and virtual war rooms let multinational forces coordinate using shared 3D terrain. Officers are able to interact with virtual units, test attack strategies, and assess risks in seconds.

Besides that, AI chatbots, digital twins, and immersive systems are poised to play a key role in military operations. In frontline scenarios with disrupted communication, these technologies can accelerate equipment readiness and enhance operational efficiency. Over time, concepts like software-defined defense—where military hardware receives secure software updates like apps—could revolutionize adaptability to evolving threats.

However, the current AI hype may lead to inflated expectations. As with many tech trends, early enthusiasm can give way to disillusionment when limitations surface. This may cause frustration, especially if initial implementations fall short. Yet, this phase is essential; it encourages a shift toward practical, value-driven applications rather than adopting technology for its own sake.

The fusion of spatial computing and agentic AI platforms is transitioning militaries from reactive to predictive operations. While immersive tech enhances tactical precision, success hinges on overcoming latency, interoperability, and ethical hurdles. As defense enters the hyperwar era—defined by AI-driven mobility and real-time adaptation—investment in cybersecurity, allied collaboration, and adaptive doctrines will determine strategic dominance.

Use Case

Capgemini developed an immersive VR-based damage assessment system using drones and unmanned ground vehicles to safely capture video from conflict zones, reducing human risk. The footage is processed with techniques like Gaussian Splatting to reconstruct realistic 3D environments. These are explored in virtual reality, allowing assessors to analyze damage without entering hazardous areas. Generative AI and object detection further enhance the experience by identifying and classifying objects such as damaged buildings and vehicles. This makes the solution highly effective for post-conflict analysis, evidence collection, and legal documentation. The technology is applicable in both active and post-conflict zones.

We Collaborate

- My Identity, My Business
- Your Business is a Mesh
- Economy of Things
- Autonomous Agent Alliance
- Synergy²

Lucy Mason

The rise of decentralized identity management, powered by next-gen technologies, will empower individuals to reassert control over their own data in an ever more complex, digital network.

My Identity My Business

What

The next year will see the push-pull of centralization and decentralization seriously challenge current approaches to identity management. Governments want a more secure, controlled approach to Web3, with more responsibility taken by providers for content and identity management – for example checking the ages of users to prevent underage children from accessing unsuitable content, with measures such as photo ID verification, or facial age estimation. At the same time, AI deepfake technologies make it trivial for anyone to create a fake ID document or upload an aged-up photograph of themselves. Working out who someone really is, and finding ways for them to authenticate themselves, is more difficult now than ever before. People want privacy and to be in control of their data, giving out only what's needed and only for as long as it's needed. Globally, 85% of adults want to do more to protect their online privacy, and two-thirds of global consumers feel that tech companies have too much control over their data. The links between digital and physical identity are being broken, with huge ramifications for the Aerospace and Defense industry.

Impact

Criminals are quick to adopt technologies and have not been slow to explore the potential for deepfake fraud: fraud attempts with deepfakes have increased by 2,137% over the last three years and have caused over $200 million in financial losses in 2025. Types of deepfake fraud have included exploiting personally identifiable information (PII) taken from open-source intelligence such as social media, or from data breaches, and creating synthetic identities which can be extremely convincing when deployed in spear-phishing or scams, including voice clones, and hyper-realistic video clones.

Wise organizations already consider identity verification and authentication solutions as unreliable on their own due to the rise of AI-generated deepfakes, but other than educating people to be wary, the challenge to find the right solution remains.

Fortunately, there are some great examples of privacy-enhancing technologies being used to protect and verify people's identities. Federated learning enables AI to work across a distributed network by sharing models instead of data. Secure multiparty computation shares encrypted data between an agreed set of people within a network and allows them to work on a dataset made up of all parties' private data, without ever seeing the raw data. Differential privacy stops others from identifying data points by carefully adding noise. Homomorphic encryption enables computations on encrypted data while the data is still encrypted. Trusted execution environments create secure areas on devices: our smartphones already use these for biometric authentication.

However, current digital identity verification practices – even cutting-edge ones – are already outdated and cannot withstand current AI deepfake technologies. Even deepfake detection technologies are losing an 'arms race' against advanced AI. We need new and better ways to authenticate identity, and fast.

Use Case

The UK Government is creating Digital Wallets to allow people to save government-issued documents on their phones using an app to prove things such as your age, identity, or eligibility for services.

Mike Dwyer

Enabled by efficient decentral 'mesh' technology, organizations can join forces, even if it's only on the fly, just for one day, for one occasion, or for one customer.

Your Business is a Mesh

What

Everything we do in aerospace and defense is a mesh, internally and externally everything is connected everywhere, there's no such thing as a linear value stream! Pretty much every major program is a joint venture or multi-sided partnership that must deliver ever more complex products and services: with more speed, quality, affordability, and across more partners and regions. Enabled by efficient decentralized 'mesh' technology, it's easier than ever for organizations to join forces and rapidly collaborate, even if it is lightweight, just for one day, for one occasion, or for one customer.

The future, is now!

We are seeing an increasing need for and reliance on digital platforms that enhance collaborative efforts across global and cross-sector environments. Complex information and data sharing with real-time collaborative working across traditionally siloed sectors can increase delivery and operational performance. The key will be managing these technologies and services in ways that maintain security and trust while delivering innovation, inclusiveness and increasing business performance.

It's not need to know, it's need to collaborate, securely.

Addressing the common We Collaborate challenges effectively and securely can create huge value by sharing data, information and solutions across aerospace, defense and aligned manufacturing sectors – even in completely parallel sectors where dual use technologies may create new capabilities in new ways. Provided that we have the right security built in to trust that we are engaging with the person or system we think we are talking to and not a convincing deep-fake or malicious actor! Technology can both enable and incentivize cross-sector collaboration, making it easier to access and share information and promote new ways of working.

AI is changing everything

The transformative effects of generative frontier artificial intelligence and all other analytical technologies – as they develop further and have sufficient safety measures built in to ensure they are reliable and true – will help us parse and make sense of huge data sets in a way never before possible. Coupling AI at the Edge, in core nodes of the mesh and across the mesh, where appropriate, can drive delivery performance, product performance and service agility.

Impact

Real-time, detailed information and decision-making data about what is happening is becoming ever more available. This is accelerating the transformation in person and autonomous based decision-making, because the same information can be made available to many people and systems at the exact same time, in ways that allow them to have better informed discussions and a better sense of the evidence. Technology can also enable diversity, opening discussions to a much wider range of people in different geographies and time zones, through collaboration platforms and virtual networking.

The rapid development of next-generation autonomous marine, land and air vehicles and solutions is the proving ground for coupling advances in technology, with new business services and value for money. The mesh of customers, suppliers and other partners must move with speed and purpose to gain and maintain operational advantage.

Use Case

Ocean Infinity is a marine robotics company founded in 2017 that uses robots to capture ocean data and deliver maritime solutions. They are headquartered in Austin, Texas, and have offices in Southampton, UK, and other locations globally. Ocean Infinity aims to revolutionize maritime operations by deploying robotic technologies at scale, reducing environmental impact and improving safety.

Patrice Duboé

When physical assets and 'things' become part of business networks, entirely new economic models are on the horizon.

Economy of Things

What

The 'Internet of Things' (IoT) has been both emerging and with us already for a number of years now. Huge amounts of work have gone into exploring the privacy, ethics, trust, security, and risk implications as a highly interconnected world has emerged – that is, 'cyber-physical' connected devices, all sorts of assets with networked sensors embedded in them.

There is still huge potential in joining things together – it will develop smarter transport systems, smarter cities, smarter homes and buildings, and even extend into wearable devices that could revolutionize healthcare. That gives rise to all sorts of challenges too, from technical challenges in doing computational activities with low power at 'the edge' – making it faster and cheaper for the consumer – but also how to manage the cybersecurity challenges that arise from those kinds of hyperconnected networks.

And unlike a lot of computer viruses, the IoT is embedded in real world objects and can have real world effects. The space industry is a major enabler for these business cases by offering services available all over the planet, anytime at affordable prices.

Impact

There are huge advantages to everything being connected, providing an almost fully informed picture of everything that's happening in the moment and has happened. Particularly useful for monitoring people and assets anywhere on the planet at any time. However, there are challenges around the potentially exponential effects of something going wrong – accidentally or deliberately - that can infect the system and propagate everywhere very quickly.

When it comes to automated vehicles, or critical national infrastructure, or pacemakers, you must be very careful about 'secure by design' principles to ensure people are safe and protected from harm. Then there are more subtle inferences from IoT data, about patterns of life and activities. Who has access to that sort of data, and how do we manage it? How do we know if it has been manipulated in some way? We also need to think carefully about the potential for an inadvertent surveillance society emerging, in ways that could really infringe on people's liberties and freedoms.

Use-Case

The Capgemini Applied Innovation Exchange in Toulouse has been developing an IoT satellite-enabled tracking prototype based on different satellite providers like the Kinéis, Globalstar, Iridium or Astrocast technologies. This proof-of-concept showcases how IoT devices linked to Low Earth Orbit (LEO) satellite constellations provide sensor information for track and trace across the globe, even in remote environments. IoT devices equipped with humidity, temperature, or other sensors, alongside GPS location tracking, open cross-sector use cases in supply chain, transportation and agriculture.

Lucy Mason

Collaborative autonomous AI agents are taking over the heavy lifting in business operations, adapting and learning on the fly.

Autonomous Agent Alliance

What

Autonomous or semi-autonomous AI tools are increasingly able to 'reason,' learn and adapt in real time. Manus, a Chinese-Singaporean Agent released in March 2025, is seen as the first step toward general-purpose agents with a broad range of capabilities. Over the coming years, AI agents will handle increasingly complex multi-step workflows, from planning through execution, with minimal or no supervision, over longer periods. Groups of AI agents will co-operate to manage multilayered systems for a shared purpose – perhaps with one AI agent managing the rest. Entire businesses may consist of one human (in the loop for supervision) and multiple AI agents doing everything else. The alliance of humans and AI agents, and the alliances (or oppositions) between AI agents themselves, become a key issue for the future.

Taken further, AI agents may become optimized to interact with one another, using language efficient and precise for them to communicate, without the messiness and imprecision of human language, effectively excluding humans from 'the system'.

Impact

Despite the flexibility of AI agents, they won't be one-size-fits-all: different AI agents will be optimized for different purposes, and some people may just like the style (or personality) of one more than another. The problem is that, as more agents act on our behalf, a 'responsibility gap' grows where a person sets the agent an end goal and then steps back. How responsible are they for what it does in pursuit of that goal? What if the goal is poorly worded and has unintended consequences, or the AI agent makes a serious mistake with real-world consequences? The more such agents are given capabilities to act in the real world (much of it online, including financial services, shopping, education, paying taxes), the more potential there is of 'terror or error': either deliberate harm caused by co-opting agents to an alternative agenda; or well-meant but poorly executed catastrophes. We simply don't know what multiple AI agents constantly interacting with one another in millions of ways, 24/7, will do. How will they learn from each other, and what if poor behaviors propagate? What happens when AI agents are in conflict, pitted against others? Until agents become more sophisticated and are safely harnessed to human purpose, we need to treat AI agents as a group of smart children: give them a clear goal, don't let them cause harm, and supervise them to stop them doing something reckless.

In defense, we see simple AI systems, well controlled and understood, used to manage systems, sometimes in multi-step processes. However, the use of an AI 'agent' (not clearly defined) gives rise to additional challenges needing careful consideration from a risk and operational perspective.

Use Case

The Imperial War Museum (IWM), London, has a huge collection of old audio recordings of World War I and II veterans, mostly in analog formats. These were impossible for researchers to search, analyze, and interpret. Transcribing over 20,000 hours of interviews would take a full-time transcriber 22 years, and understanding their context requires extensive research. To address this, Capgemini Invent developed an AI-powered pipeline in Google Cloud using the latest Gemini models to transcribe 44,000 audio files. We also created summaries, timelines, and extracted entities, achieving 97% coverage across 15 languages and 8,000 interviewees. A client-hosted app, built with React on a GCP environment, enables users to search and explore recordings, AI-generated transcripts, and insights. BigQuery stores metadata for scalable search, transforming archives into accessible, engaging resources—adding value by generating individual timelines. IWM researchers can now easily query digitized records, and IWM may offer a portal for visitors to explore the collection, including mini-podcasts and audio-description.

Mike Dwyer

The new workplace combines human creativity and insight with technology, balancing virtual and physical means into a powerful mix.

Synergy²

What

This evolution enables us to do more with less. The future of A&D lies in rapid, robust, accurate innovation—driven by engineers, empowered by AI.

Everything in aerospace and defense is powered by human creativity. Engineers continue to push boundaries, solving complex problems across A&D products and services. However, the vast design space demands augmentation. Today, the synergy between human ingenuity and machine intelligence is exponential. With generative AI and hybrid methodologies grounded in trusted physics-based models, we can explore more design variants, accelerate mission performance, and enhance engineering and manufacturing processes. This evolution enables optimization of aircraft weight, understanding of lifecycle usage, and extraction of insights from massive datasets. The future of A&D lies in rapid, robust, accurate innovation—driven by engineers, empowered by AI.

At the heart of AI adoption in A&D is a cultural shift—learning to trust augmented technologies. In this industry, we begin with a "zero trust" mindset. It's cautious, and necessary. But as we validate AI's performance, understand its boundaries, and see where it adds value, trust builds. Employees may feel threatened, fearing automation or AI will replace them. But their roles are evolving—not disappearing. The goal is to shift focus from repetitive tasks to meaningful, problem-solving work that adds real value. Their roles can become more dynamic, productive, and fulfilling.

Impact

In the short term, we're seeing a wave of proof-of-value pilots across A&D. Teams are experimenting with generative platforms and agentic systems in focused, limited use cases—measuring their impact on daily workflows, speed, and productivity. In an industry where every hour counts, the goal is clear: maximize time spent on high-value tasks like engineering, manufacturing, and creative problem-solving, while minimizing time lost to admin and information retrieval. Early successes—like using metahumans for training—are helping organizations recognize the value of these technologies. As confidence grows, the conversation is shifting from experimentation to scaling.

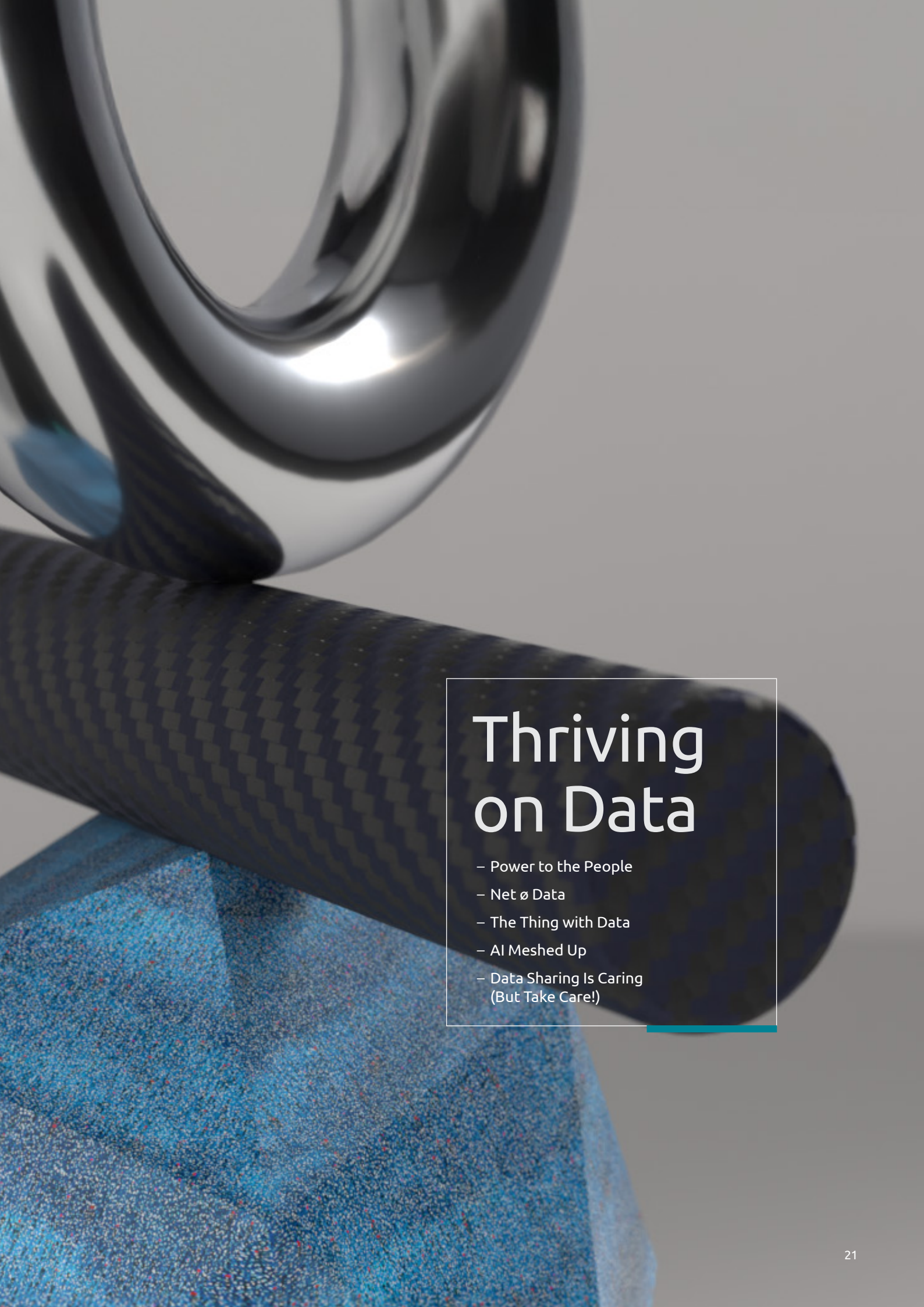
Long term, this transformation has the potential to redefine the A&D workforce experience. By integrating cutting-edge tools into meaningful missions, we make the industry more attractive to new talent—offering purpose-driven work augmented by powerful technology. Moreover, AI will play a critical role in tackling complex challenges like sustainability and net zero. Whether it's reducing CO_2 emissions, improving ethical sourcing, or minimizing waste, AI enables multi-dimensional decision-making across design, manufacturing, and supply chains. Ultimately, this journey is about empowering people, helping them understand their roles, making better decisions, and contributing meaningfully to the mission.

Use Case

A compelling example of how artificial intelligence is transforming the Aerospace and Defense industry is its application in visual inspection. Traditional methods—often manual—are prone to fatigue, errors, and delays, risking costly rework and safety issues.

Capgemini's AI-powered Visual Inspection (AVI) systems are changing this landscape. They can instantly detect cracks, dents, and corrosion by analyzing images. These systems also map the identified defects to the geometry of the component and correlate recurring defect patterns with likely root causes by leveraging process data.

The results of implementing such systems are impressive. Detection accuracy reaches between 85% and 90%, which helps ensure compliance with industry standards. Rework and scrap costs can be reduced by up to 30%. Additionally, there is a 40% reduction in critical defect-related failures, which significantly enhances safety and reliability.



Thriving on Data

- Power to the People
- Net ø Data
- The Thing with Data
- AI Meshed Up
- Data Sharing Is Caring (But Take Care!)

Santosh Soni

A growing scarcity of specialized skills, the need to activate data as close to the business as possible, plus powerful AI and automation tools, are all driving the unstoppable self-service data revolution.

Power to the People

What

Modern aircraft are generating huge volumes of data, making data a strategic asset for Aerospace and Defense (A&D) organizations. There is a significant focus on unlocking the hidden treasures and insights to be found, through tools and platforms, and empowering the workforce in proactive and faster decision making across the enterprise. Continued advances in IoT and sensor technologies, where numerous sources of data are integrated, bring continuous streams of data being generated and consumed during the design, manufacturing and supply chain and services of the aircraft.

Previously, data was limited, and decision-making was slower, but now, with real-time data being collected through advanced technologies, the entire system is becoming more responsive and informed. We can now look through the multiple aspects of operations and extract value from them. The trend reflects the shift in control and decision-making powered by better data availability, smarter systems, and connected technologies.

Impact

The trend is impacting the entire A&D industry value chain including extended enterprise in leveraging the power of data analytics across the design and development, manufacturing and supply chain, aftersales support and sustainability.

A&D organizations can empower their workforce with generative AI and agentic AI across the value chain to:

- Increase productivity in managing their activities in product design & development
- Improve the manufacturing and supply chain operation through visibility, traceability and proactive risk management
- Reduce operational cost by leveraging data driven insights and action recommendations
- Improve sustainability performance through better visibility and proactive actions to stay on track
- Improve customer service and satisfaction through predictive aircraft performance, maintenance requirement and ensuring the spare parts availability

Use Case

GE Aerospace has launched a company-wide generative AI platform called AI Wingmate, developed in collaboration with Microsoft, to empower its 52,000 employees with secure, AI-driven productivity tools. Built on Microsoft Azure's AI infrastructure, AI Wingmate enables employees to engage in natural, conversational interactions with AI to enhance innovation, streamline tasks, and support decision-making. The platform is designed to operate within GE Aerospace's secure network, ensuring data privacy and compliance. Since its launch, it has processed over 500,000 employee interactions and 200,000+ pages of content.

Philip Harker

Data is key to delivering net-zero ambitions. But data itself needs to be sustainable, too: the battle against data waste is on.

Net Ø Data

What

Let's start with the obvious, the Aerospace and Defense industry can change the face of the planet; it is responsible for making, using, maintaining, and decommissioning the most complex machinery ever made, and with a constant rate of innovation and engineering evolution. The industry recognizes this, and although regulation and legislation around Environmental, Social, and Governance (ESG) are not new to an already regulated industry, it is not a simple fix. Indeed, the International Aerospace Environmental Group along with other International Air Transport Association (IATA) members, plan Net-Zero carbon emissions by 2050 for civil aviation travel.

Digital and data initiatives have gained momentum across the lifecycle to tackle the challenges ahead. From early prototypes and proof of concepts to mainstream adoption, harnessing organizational data and embracing new AI concepts like generative AI and Large Language Models (LLMs) will provide deeper insights and enhanced analytic capabilities. For instance, using LLMs to interrogate the supply chain can help remodel a less carbon-intensive logistics plan, while recalibrating performance to optimize mean time between failures based on actual performance, rather than supplier estimates, will increase efficiency and reduce waste. Technologies like Digital Twins and 3D visualization are providing ways to overcome ESG challenges. These visualization technologies, when layered over Product Lifecycle Management (PLM) or asset data, are not only more cost-effective in terms of compute power and affordability but also, when combined with LLMs, can illustrate the opportunity to drive a more holistic ESG impact, beyond just financial or operational efficiencies. However, the use of AI, particularly generative AI and LLMs, incurs computing costs. While these are reduced with increased efficiencies, their impact should be considered when setting modeling objectives. AI alone won't solve ESG, but it can help and will evolve to target ESG.

Impact

In terms of the immediate effect of Net Zero Data on businesses, industries, and societies, many organizations have initially been hesitant to embrace the opportunity, viewing it as another burdensome task to comply with additional regulations. However, those that address ESG challenges through the People-Process-Technology perspective can reap immediate 'green adoption' benefits or avoid being associated with not contributing to the resolution of a much bigger problem. Engaging with shareholders, employees, and the broader market about the magnitude and approach of the organization, and sharing authentic, meaningful actions, is more likely to attract investors and talent. Early adopters may face challenges due to a lack of knowledge about regulations and legislation, as well as a deficit in the data needed to comply. It's not just about the lack of readily available trusted data for reporting; there is often a need to gather additional data to complete the picture. The available data is typically inconsistent, raw, incomplete, and inaccurate, so there is a business need to ensure reporting is accurate and timely. The trend creates opportunities for innovation and competitive advantage by treating carbon as a cost and assigning a monetary value to it. Game changers have developed an end-to-end approach to carbon accounting, leading to comprehensive business oversight centered around an Environmental Profit and Loss (EP&L) metric. This approach represents true leadership, and organizations that adopt it are among the most pioneering and transparent in understanding how their products and services impact the planet.

Use case

Many organizations are exploring ways to understand and address ESG regulations. In manufacturing, this follows a similar evolution to health and safety standards. For example, Personal Protection Equipment (PPE) for welding monitors and protects the welder and also tracks gases and emissions to protect the atmosphere. This requires knowledge of regulation, processes, and accurate data for valid reporting.

Christophe Gaube

An abundance of data going around the Internet of Things — at the edge — turns mundane objects into hyper-intelligent, connected assets around us.

The Thing with Data

What

In the scenario of multiple Internet of Things (IoT) sensors (from different vendors) communicating in diverse languages, a robust data management strategy is essential to perform meaningful data analysis to add value. The NATO Generic Vehicle Architecture (NGVA) plays a pivotal role in standardizing vehicle data protocols, thus facilitating the extraction of valuable insights from the collected data. NGVA is an approach developed by NATO partners and related industries to standardize the interfaces and protocols for military vehicle systems integration. Managing data flow is not just about broadcasting all the data; it's about understanding who has what information and who needs which pieces of information.

Similar to how the internet works with search engines, there needs to be a system in place for requesting and providing information in a connected defense scenario. This data management system must be high-performing, with low latency and real-time capabilities, especially for tasks like tracking enemy positions or following coordinates. The goal is to enable soldiers while reducing their cognitive load. It's not about having massive amounts of data, but about having the right information at the speed of relevance. This requires collaboration between technology experts who can provide the data and clients who just need the information, finding a balance that meets both sides' needs. This makes cascaded services essential.

While a laboratory can provide a wide range of high-quality data and services, the real challenge lies in cascading these services down to the edge, where resources are more limited. This means defining data clearly, using the right protocols and language, and implementing the right algorithms. Additionally, it's crucial to generate dummy or synthetic data, especially for training AI models. Using classified data for training is often not feasible due to security concerns, so having synthetic data allows for effective learning and improvement of services, software, and algorithms. Overall, unclassified data is key to leveraging its full potential for enhancing services and technologies.

Impact

The impact of The Thing with Data trend is significant, especially in the context of a connected battlespace or defense systems. Effective data management ensures that relevant data is available where and when it is needed, without overwhelming the system or causing performance issues. To avoid overwhelming everyone with a lot of data and causing a denial of service, it's crucial to speak the right language and define protocols and interfaces with global standards or API standards for coalition partners. This ensures interoperability and modularity, allowing sensors to provide microservices that can be used in various solutions, leading to an increase in flexibility by assembling solutions from these microservices.

This approach enables high-performance use of sensor data. In practice, adapting sensors to the NGVA is essential to understand their performance. Time stamping is important for data accuracy, as delayed data can lead to incorrect information. This becomes especially critical when using screens for real-time monitoring, as delayed data can distort the picture. Therefore, it's important to assess sensor performance upfront, especially for AI development and decision support, as data synchronization and fusion are key. In a connected world, time synchronization is fundamental, as unsynchronized data and information lack coherence. To handle such huge data, we need software. It not only emphasizes the importance of software for managing data but also presents opportunities to reduce lead times and maximize resource utilization end-to-end.

Use Case

Northrop Grumman Corporation, a US-based aerospace and defense company, showcased its Combat Edge software, enabling critical situational awareness data sharing on handheld devices without cloud connectivity. This technology enhances resilience and supports Joint All-Domain Command and Control for war fighters.

Philip Harker

A diverse mesh of different AI components, all with their own unique capabilities, provides better solution options while boosting confidence level.

AI Meshed Up

Operational Enablers	Staff Development, incl. AI/Data Literacy	AI/ML Capabilities	AI-enabled Operational Capabilities
Technical Enablers	IOT, Sensor, and Other Edge Capabilities	Knowledge Graph(s)	Digital Twin(s)
Data Enablers	High Quality Data Products	Data Fabric and Catalog	Data Governance and Stewardship

What

For AI to reach its full potential, it will need to be visioned through three distinct and interconnected enablement levers: Data, Technical, Operational.

The basics remain the same as in any analytic inquisition, garbage-in = garbage-out, but even more so, it is the necessity to have significant trust in the quality of the underlying data. Hence, data trust prevails as the underlying mandate.

From trust in the data, how can you ensure that the trust is not eroded with the exploitation of the data through AI? The importance of understanding the opportunities for AI needs to be tempered with the understanding of the implications, intended or otherwise, of AI. With the effort to develop and embed AI into processes and solutions, consideration for how AI functions and interoperates with policy and operations and indeed humans should be understood, else, trust will likely be eroded. For example, when embedding AI into a decisioning process, there will need to be robust, dependable and stable guardrails to meet safety and compliance requirements.

With Data enablement as the underpinning empowerment of AI, and Operational enablement as the guiderails, the middle component is the Technical enablement; an exciting and market-challenging blend of innovation and science. It is an art to assemble the components to complete the solution. For example, to avoid falling into the pitfall of implementation of technology for the sake of technology, the use of knowledge graphs is useful for exposing information relating to the data and, therefore, tracking its value.

Impact

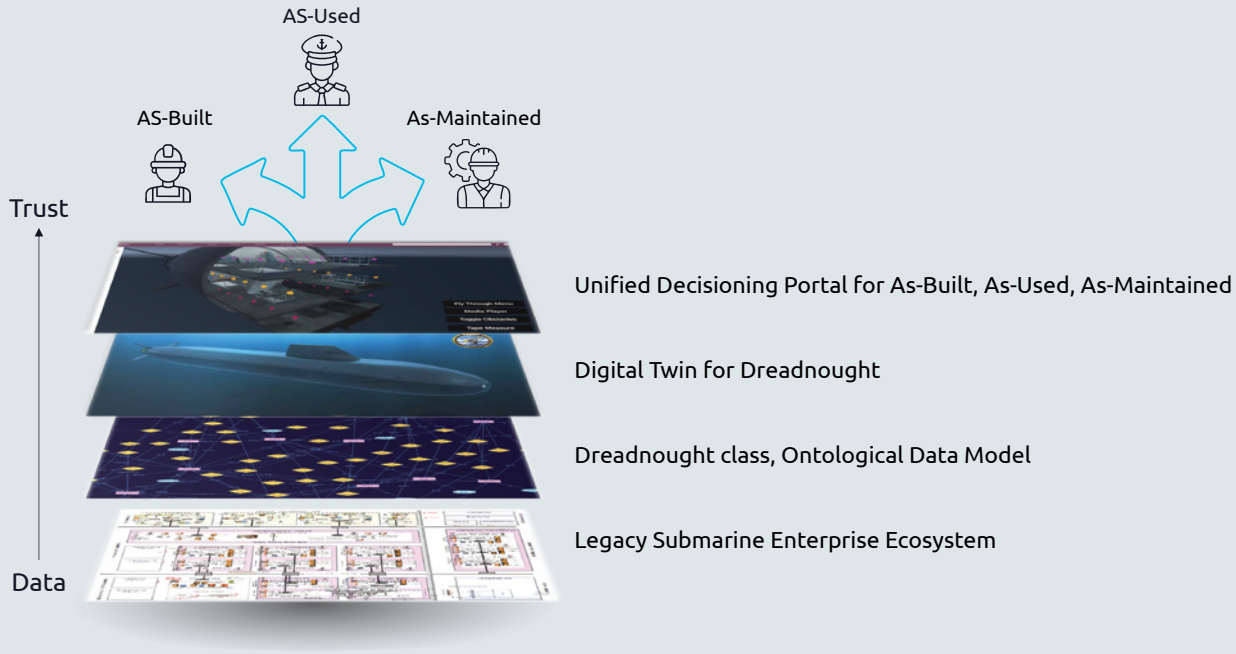
The Aerospace and Defense industry is no stranger to complex products with a generational lifetime. Concorde's iconic image and sound over 40 years of flying service was a historic feat of innovation, a pioneering airplane of its time. But its commercial demise taught us that pure innovation alone cannot outweigh expensive and escalating maintenance costs. The expected cost of the program in 1962 was £70m (~£1.5B in 2025 value), but these escalated ten-fold over the lifetime. Today, many in the industry are facing lifetime product value beyond 50 years, and as such it's a real and considerable planning consideration to address the enduring aspects of these often technically advanced products for

their systems of use. With the digital and data footprints of these leading-edge technology components, there is a mesh of data, standards, intellectual property, responsibilities and very sophisticated integration to master.

With these significant challenges to face, the industry is more than ever a fertile ground for innovation and rapid technological advancement, especially in the use of general Artificial Intelligence and generative AI.

Indeed, it is an AI mesh opportunity for many, that, if applied correctly, could bring future innovations for generations to come.

Digital Submarine example



Use case

The Digital Submarine project delivered by Capgemini for the UK Ministry of Defence (MOD) illustrates just how these enablement levers can be implemented in a mission-critical environment for enduring capability across decades.

First, an ontological data model that will present the data in a cataloged and governed environment that represents the ecosystem of partners, (the builders, the power systems, the weapons, the maintainer, the submarines). From the data layer, digital twin representation of the boat is derived, mastered by the 'As-Built' community. As the boat is deployed at sea, the 'As-Used' community will use the digital twin to record and maintain operations while afloat. Post-mission, the boat will return ashore for regular maintenance and refit where the 'As-Maintained' persona uses the digital twin as the record of use, where service records are captured in a unified system. The top layer of the functional solution is the Large-Language-Model to query the knowledge library across the As-Built, As-Used, As-Maintained communities, empowering each persona with consistent information and in turn, feeding the knowledge library through their experience and a constant optimization of digital Standard-Operating-Procedures (SOP).

The enduring data and digital twin will ensure transparency and consistency are maintained through the lifetime of the aligned physical and digital boat.

Martijn van de Ridder

The journey should begin with foundational learning, followed by the gradual integration of multimodal chat interfaces, and eventually, the ability to supervise and validate AI-generated outputs.

Data Sharing is Caring (But Take Care!)

What

The Data Sharing is Caring trend originates from a fundamental truth: collaboration is only possible when data is shared. When this idea is transposed to the defense value chain, it becomes clear that data sharing is essential at every stage. In the R&D phase, experiments and validations generate valuable insights, often within closed environments. But once a product transitions from development to operational use, especially by public defense organizations, it enters a new context where technical and operational data is generated. This data becomes crucial for monitoring performance and feeding insights back into the development cycle.

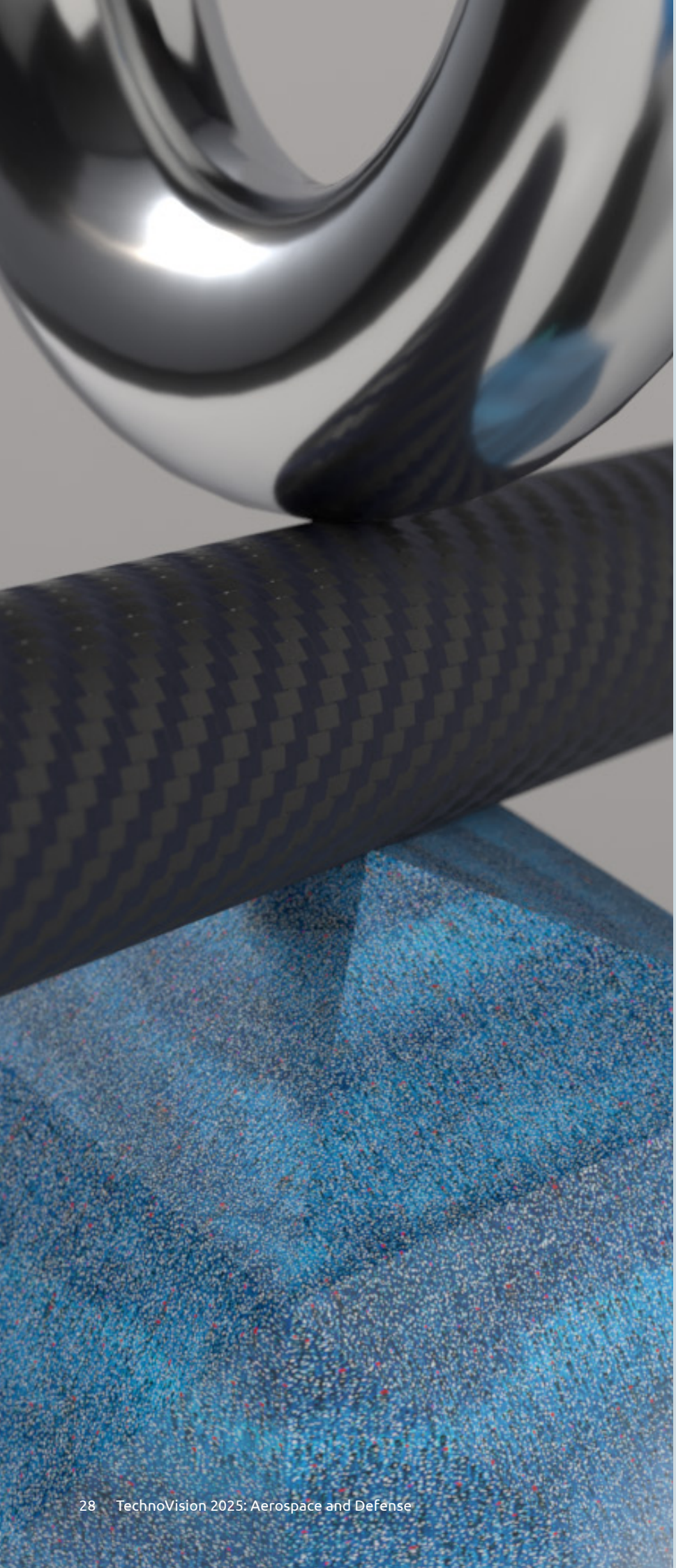
In the defense context specifically, collaboration is not limited to a single domain. Missions often involve multiple disciplines—space, air, cyber, and more—each contributing a piece of the puzzle. To form a complete picture of what is happening or what needs to happen, these pieces must be shared and integrated. That, at its core, is what this trend is about: enabling effective collaboration through meaningful and secure data exchange.

This year, we're seeing the emergence of several promising technologies that could help overcome some of the persistent challenges in data sharing—particularly the issue of trust. Sharing data requires a strong foundation of trust, and that's not always present. However, new privacy-enhancing technologies are beginning to address this. These are often based on cryptographic methods that allow data to remain encrypted while still enabling certain types of analysis. Simply put, these technologies make it possible for one party to perform specific computations—like calculating an average—on another party's encrypted data, without ever accessing the raw data itself. This approach gives the data owner precise control over what can be done with their data, which is a significant shift from the current norm where full datasets are often requested without clear justification.

When it comes to both agentic and autonomous systems, data sharing plays a critical role. These systems operate in a loop—data is used to train the model, the model takes actions, those actions generate new data, and that data feeds back into the system. The more data you can feed into this loop, the stronger and more accurate feedback becomes, ultimately enhancing the system's capabilities. To make an AI agent truly useful and relevant, it needs to be trained not only on internal company data but also on information from the broader ecosystem in which the company operates. The richer and more specific the data, the better the agent can perform. In the defense industry, where organizations are often cautious about using open internet sources due to security concerns, having access to internally shared, high-quality data becomes even more crucial.

Impact

From a defense perspective—and increasingly visible in aerospace as well—organizations are becoming more embedded in ecosystems where collaboration with both suppliers and buyers is essential. In such tightly connected environments, the emergence of privacy-enhancing technologies is proving to be a game changer. This approach enables secure, controlled data exchange, giving the data owner full authority over what can be accessed and how it can be used. As a result, more data can be shared across the ecosystem, which directly supports the vision of a connected defense. For instance, a fighter jet in operation generates data that, when shared securely with the manufacturer, can be used to improve predictive maintenance and asset performance. This kind of data sharing not only enhances the efficiency of the supply chain and product lifecycle but also significantly improves mission planning and command-and-control processes.



To achieve goals like circularity and net-zero aviation, data sharing becomes essential. You need to understand how systems and technologies are being used in real-world, day-to-day operations. This includes knowing the impact of certain actions or interventions and being able to measure their outcomes in a data-driven way. Without access to that data, it's nearly impossible to make informed decisions or track progress effectively. In this context, no company operates in isolation; it's always part of a broader ecosystem. That means collaboration and data sharing across partners are critical to drive sustainability forward.

The overall impact of this trend is substantial—it fosters greater connectivity, enables smarter collaboration, and ultimately leads to more agile and effective defense operations.

Use case

Roseman Labs offers an innovative solution for organizations that want to collaborate on data analytics without the need to share sensitive data. Using their advanced Multi-Party Computation (MPC) platform, companies can jointly gain valuable insights from their data while meeting strict privacy and compliance requirements. This enables secure and efficient collaboration, regardless of the sensitivity of the information.

Process on the Fly

- Autonomous Enterprise
- Can't Touch This
- CTRL-ALT-Human
- Micro Process Magic
- Whole Lotta Fusion

Caroline Ball

Harnessing AI, the autonomous and unattended 'lights-out' enterprise continually optimizes itself, bringing harmony and blending capabilities between humans and technology.

Autonomous Enterprise

What

Autonomous Enterprise harnesses the blend of human and technological capabilities to provide optimized processes, putting the emphasis on automation with the human-in-the-loop for specialized tasks. By placing the human in the loop only where necessary, and where they bring the most value, regular processes requiring little expertise can be autonomized. Not only does this bring optimization, but a better blend of capabilities between humans and technology. Reflecting on this year's TechnoVision theme, the AI swing continues from last year and pushes further towards agentic AI; 'agentification' bringing a powerful new leap towards autonomous, self-driving businesses.

We continue to see satellite launches in their thousands, building the mega constellations required for global coverage, but it is heavy launches that have reached the headlines recently. The first commercial flight for Ariane-6 in March 2025 is a noteworthy European success but comes four years after the originally intended launch date in 2021. While the delays result from a number of contributing factors, not all related to operational readiness, Europe's heavy launch capabilities depend on the ability to keep Ariane-6 in operation. A continuing reminder that the pace industry must adopt smart manufacturing processes, including automation, advanced robotics and now agentic-AI. This means enhancing and streamlining processes to enable production ramp-up, and keep up with the increasing demand and keep existing assets in operation.

Impact

The use of smart manufacturing processes, particularly AI-enhanced automation, is pushing industry to innovate in a rapid manner. There are more start-ups offering new and innovative manufacturing processes for satellites, launchers, and other space structures. While we are still far from a 'lights-out' enterprise seen in other sectors, the trend is pushing private actors to innovate, to break into and stay in the market. But this also means that keeping up with the pace is vital to remain competitive and stay ahead of the curve. Launchers, in particular, represent a potential bottleneck or point of vulnerability, as they are the gateway to services in orbit that can be rocked by even the slightest delays. A positive impact of this trend is the increased focus on sustainability in space manufacturing. Greater private investment has brought a critical eye on sustainability, in a sector not traditionally known for its green virtues, but again is pushing private actors to innovate, change the as-is and rethink ways of doing things that have been in place for generations.

Use Case

Helsing, a leading European defense technology company, and Loft Orbital, known for satellite infrastructure, announced their partnership in February 2025 to develop a multi-sensor satellite constellation. This system will use AI capabilities for real-time intelligence and situational awareness for European defense missions like border surveillance, troop tracking, and infrastructure protection. The constellation, comprising various Loft satellites with advanced cameras and RF sensors, will utilize Helsing's on-orbit AI processing to detect and classify military assets globally. It features high reactivity, short revisit periods, and low-latency data processing for tactical decision-making and rapid response.

Gary James

A process seamlessly adapting to its environment, delivering optimal performance — all without human intervention on the spot, all remotely managed.

Can’t Touch This

What

It is a cliché to say, “the Aerospace and Defense industry is highly dynamic”, because the current geopolitical situation seems to develop on a daily basis. The pendulum swing is impacted by forces that are both sporadic in their frequency and chaotic in their direction. When looking to explain how to deliver autonomous processes within an ever-changing environment in a controlled and swift fashion, the Eurofighter Typhoon provides an elegant analogy. The Typhoon aircraft is highly agile, able to react to changes swiftly to successfully deliver expected outcomes. This is achieved through speed, responsiveness and an acceptance of inherent instability, delivered through a combination of human and non-human interaction.

Like the Typhoon, in the face of swings, organizations must continue to ensure stability and efficiency to thrive in this evolving landscape. This means stable and efficient business processes, supported by reliable applications. An organization’s process platform must be able to adapt, following the Can’t Touch This trend as closely as possible. As organizations become more complex, and markets more dynamic, touchless “fly-by-wire” systems must increasingly be in place to enable organizations to become autonomous at the core, thereby enabling human creativity, innovation and responsiveness at the edge. Established technologies such as workflow and business process management tools, combined with the latest innovations from generative and agentic AI, are crucial for delivering touchless operations.

Another similarity to the modern jet fighter is the integration of automatic control mechanisms; in our Can’t Touch This trend we mean embedded quality engineering (QE) and service reliability engineering (SRE). These capabilities ensure that processes are stable and resilient, preventing failures when processes run autonomously. Finally, looking to the future, generative and agentic AI will continue to transform the landscape with their impact only set to accelerate. With these technologies, we have more dynamic partners that not only help to establish a touchless environment but also evolves it, enhancing efficiency and adaptability – and this at different levels of the organization – process, application, platform, device, etc.

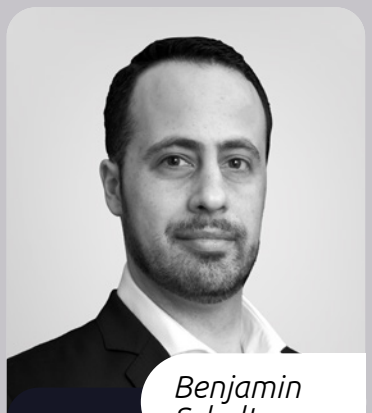
Impact

The continued swing towards touchless operations is reshaping organizations by freeing up employees' time for more valuable tasks. Automating routine processes enables tactical continuous improvement as well as more strategic contributions. However, this trend requires a deep understanding of business processes and data to avoid chaos. This change means that organizations must become more data-centric, requiring accurate data and insights for effective implementation – a business “heads-up” display. Traditionally, responding to business process issues involves many people on standby. However, with a business “heads-up” display, robotic monitoring systems can be used to predict and prevent incidents. These robots and agents will further free up time, enhancing efficiency.

One significant immediate impact is increased supply chain responsiveness. Additionally, applying touchless processes to the development lifecycle can shorten the delivery time of products, which often span several years in the defense industry. In the longer term, this trend will abstract complexity for people, letting them focus on finding new ways to improve processes and innovate, enabling not only the generation of more ideas but also their faster implementation. We can expect to see touchless networks expanding into various areas such as supply chains and networks.

Use Case

While Gen AI is still a nascent technology there are some exciting developments taking place. For example, one aircraft equipment manufacturer has shown, via Minimum Viable Product (MVP) tests of a Man-Machine Teaming module, the significant productivity potential for aircraft monitoring and inspection. Not only were productivity gains observed, but the increase in accuracy of inspection was also benefited.



Benjamin Schulte

Automation amplifies human potential, blending human intuition with machine efficiency to drive ethical, creative, and innovative outcomes.

CTRL-ALT-Human

What

AI and automation are becoming increasingly pervasive in defense, automating whole workflows and processes with agentic capabilities or equipping unmanned systems with unparalleled levels of autonomy. These technologies augment human capabilities, allowing for operations that minimize direct human involvement, thus enhancing efficiency and safety. This includes the use of AI-driven systems that support humans in various tasks, from frontline operations and military logistics to recruitment and training of new recruits. Moreover, the integration of generative AI (Gen-AI) with human expertise has the potential to tackle complex problems in the military domain. By combining Gen AI's rapid data processing and pattern recognition with human strategic insight, military design thinking can move beyond linear planning processes, enabling more adaptive, creative, and innovative solutions to a wide range of operational and strategic challenges. This approach can unlock novel capabilities in mission planning, threat analysis, and operational decision-making, pushing the boundaries of what is possible in modern defense strategies.

Impact

Given the increased automation, there is a balance to be found between autonomy and human oversight by maintaining the human in-the-loop or on-the-loop, depending on the system. Particularly in critical applications like targeting, maintaining human control and oversight remains essential. Military operations must operate within strict ethical and legal frameworks, including rules of engagement, which must be explicitly integrated into any AI-driven solution to ensure responsible and lawful use. As the pendulum swings towards more automation, we must remember the Human in Ctrl-Alt-Human to drive creative but ethically sound innovation in defense.

Use Case

Capgemini has organized a military design thinking workshop, bringing together a diverse ecosystem of soldiers, end-users, defense startups like Hologate, and major defense contractors. The goal is to foster collaboration on innovative solutions, including leveraging the power of generative AI to address complex military challenges.

Caroline Ball

Miniaturizing processes into micro-sized forms to achieve greater speed, agility, and efficiency — while learning more about daily operations.

Micro Process Magic

What

In an industry where processes are built to last for decades not years, legacy monolith systems are often commonplace but difficult to upgrade, optimize and improve to enable greater agility and scalability. Micro Process Magic is all about unleashing the magic of the micro, breaking down monolithic processes into smaller and smaller pieces. Fueled by microservices, APIs, cloud technology and the Web3 mesh web, each piece can hold its own while seamlessly interacting with each other.

In the space sector, we see this play out in ground segments, where rather than custom-built end-to-end systems, integrators look to leverage ready-to-use building blocks with limited customization on top. By breaking down the once monolith system, ground segments systems utilize standardized APIs and cloud-based solutions to accelerate development time and enable the exchange of one building block for another. As a result, the associated processes are segmented, in the form of Ground Segment as a Service (GSaaS) models that can be delegated in a SaaS mode. Such GSaaS models are based on the virtualization of traditional ground segment components that are generic and re-used for each mission, with little need for customization. Services such as Command and Control, Space Surveillance or Flight Dynamics can be provided by off-the-shelf solutions, enabling rapid deployment at reduced cost.

Impact

In the fast-evolving new space era, new actors need to bring new solutions and services to the market at a fast rate. By unleashing the power of independent reusable units, providers are better able to swiftly adapt and innovate, cherry-picking the best from the market. This is particularly important in the Space for All paradigm, whereby space services are utilized across industries, as non-space industries look to leverage technologies without the need for in-depth expertise in the space domain. Furthermore, with ever-increasing private interest in the Space sector, resulting in more and more players in the field, innovation and agility enable players to stand out from the crowd and respond to this evolving market. For example, the decoupling of processes and the integration of cloud-based solutions have opened up 'Direct to Cloud' innovations, where Edge capacities onboard are directly linked to cloud-based ground segments, with some processes even deported onboard.

Use Case

The DOMINO-X project represented a significant advancement in Earth Observation (EO) technology through its innovative modular architecture. The framework was designed to be flexible and adaptable, allowing for the integration of various components, or "Dominoes," each with defined roles and interfaces. These modular building blocks can be tailored to specific mission requirements, supporting a range of EO missions or dedicated tasks. Capgemini played a role in this project through its contribution of expertise in developing the flexible ground system framework and ensuring that the modular components were easily integrated and evolved as needed. This approach not only enhances the efficiency and scalability of EO systems but also fosters collaboration between industry, governmental bodies, and research institutes, leveraging established standards to create a cohesive and interoperable system.

Caroline Ball

The fusion of physical and digital intelligence — powered by digital twins, robotics, and advanced connectivity — optimizes processes, enhances resilience, and drives scalable innovation.

Whole Lotta Fusion

What

When the physical world fuses with digital intelligence, it's a highway to overdrive. Digital twins, high-fidelity replicas of physical processes, let organizations simulate, monitor, and optimize without breaking a sweat. What better physical world to digitalize, than our own blue marble, planet Earth. Digital twins of the Earth are advanced, dynamic models that replicate the planet's systems and processes in a digital environment. These models integrate continuous observations from satellites, in-situ sensors, and other data sources with high-performance simulations and AI. By doing so, they provide a highly accurate representation of the Earth's past, present, and potential future states.

Impact

Earth Observation programs have been ongoing for decades, but as our climate rapidly changes, digital twins, updated with the latest measurements and observations from multiple sources, are vital to anticipate and adapt to the future. They can simulate the impact of different climate scenarios, helping organizations, policymakers and researchers develop strategies to mitigate adverse effects. This capability to run "what-if" scenarios and assess potential outcomes makes digital twins invaluable for high-accuracy predictions and informed decision-making. Without forgetting that some corners of the Earth still remain mysterious: there are currently better maps of the Moon's surface than of the bottom of Earth's ocean…Deep Space or Deep Blue?

Use Case

Destination Earth (DestinE) is a European Union initiative to develop a digital replica, or digital twin of our big blue marble by 2030. This endeavor will facilitate greater understanding of our changing climate, as well as dangerous, extreme weather events. Designed to create a step change in environmental prediction by using the latest advances in numerical prediction, digital technologies, supercomputers and artificial intelligence, three major European organizations, European Centre for Medium-Range Weather Forecasts (ECMWF), European Space Agency (ESA) and the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), have combined their expertise and competencies. Together they implement DestinE with over 100 partners throughout Europe. To efficiently deploy and embed the different Earth-system digital twins within the overall DestinE system, the Digital Twin Engine component brings together the software infrastructure necessary for extreme-scale simulations, data fusion, data handling and machine learning. It provides a common system approach to a unified orchestration of the Digital Twins and allows users to interact with them and their data.

Applications Unleashed

- Little Green App
- Chat is the New Super App
- When Code Goes Know
- Honey, I Shrunk The Applications
- App = A Robot

Sebastien Kahn

Applications engineered to be less demanding in terms of resources and energy with superior performance are more sustainable, but also are of higher quality.

Little Green App

What

Civil aviation emitted around 950 Mt of CO2 in 2023, accounting for 2.5% of global CO2 emissions. Air traffic is expected to double by 2050, which could push emissions beyond 2 Gt/year, in a business-as-usual scenario where traffic growth is forecasted at +3%/year.

To achieve the sector's decarbonization, several levers will need to be leveraged, with Sustainable Aviation Fuels (SAFs) being the first in terms of share, accounting for around 53% of the total (depending on the scenarios). The industry's shift towards these fuels not only addresses environmental concerns but also digitizes the fuel supply chain, enabling more flexible and transparent market operations for SAF—critical for widespread adoption and integration of these greener alternatives. Environmental claims typically require supporting evidence. The verification systems associated with these claims are commonly referred to as tracking tools or chain-of-custody systems. Three systems are available:

- Physical segregation: requires a costly separate supply chain for SAF, which is unnecessary since SAF is compatible with existing infrastructure. This approach is economically and environmentally disadvantageous.
- Mass-Balance: allows SAF to be part of a closed system, enabling equivalent fuel withdrawal elsewhere and sharing environmental benefits. It offers advantages but requires a confined supply infrastructure.
- Book-and-claim: uses tradable certificates to separate environmental benefits from SAF, offering flexibility and scalability beyond infrastructure or borders. It allows efficient trading of benefits, minimizing logistics, costs, and emissions.

To facilitate SAF use, book-and-claim platforms are emerging to digitalize the fuel supply chain, creating a more flexible, transparent market, while unifying pricing and standardizing transactions across the industry.

Impact

Undertaking, around the same table to establish norms for the digitalization of SAF impact. The main objective is to ensure that the credits represent actual liters or gallons of SAF used and to avoid any potential greenwashing. Cybersecurity measures are also significant, as any credits issued will need to be directly linked to SAF production. Collaborations between companies are underway to develop SAF processes locally to ensure airports are well supplied.

This initiative includes using digital book-and-claim platforms to manage and trace SAF use, enhancing transparency and accountability in the industry's shift towards sustainable practices. The timeline for scaling up SAF production is lengthy, with projections extending to 2050 when around 50% of jet fuel is expected to be sustainable. As of 2024, only 0.5% of total jet fuel used was sustainable (1.3 billion liters of SAF), underscoring the scale-up required.

Use Case

The RSB platform is one of the main book-and-claim platforms for SAF and enables airlines and other stakeholders to manage their use of SAF more efficiently by allowing them to purchase SAF or corresponding credits through a standardized system. This platform is vital in regions where SAF is not readily available, ensuring that airlines can still meet their sustainability commitments by supporting the global availability of SAF. In March 2025, Airbus announced its support for the RSB platform by launching a book-and-claim initiative in collaboration with seven major industry players, including SMBC Aviation Capital, AerCap, Comlux, Luxaviation, Novespace, Rive Private Investment, and SAF Aerogroup. Acting as a facilitator, Airbus will purchase SAF certificates via the RSB platform, manage their sustainability attributes, and resell them to interested customers, mainly aircraft and helicopter operators, aiming to showcase the book-and-claim approach's reliability and potential in both voluntary and regulatory markets.

Naimeesh Chauhan

The journey should begin with foundational learning, followed by the gradual integration of multimodal chat interfaces, and eventually, the ability to supervise and validate AI-generated outputs.

Chat is the New Super App

What

The trend "Chat is the New Super App" is emerging in response to the growing need for streamlined, AI-augmented interaction models. The aerospace and defense industry often faces challenges such as navigating complex supply chains, managing frequent engineering change requests, ensuring regulatory compliance, safeguarding against cyber threats, adapting to rapid technological advancements, addressing workforce shortages, and making real-time, high-stakes decisions under strict budget and environmental constraints. Chat-based applications help aerospace and defense organizations overcome operational complexities by enabling secure, real-time collaboration, accelerating engineering workflows, integrating with enterprise systems for data-driven decisions, and ensuring compliance through auditable, centralized communication.

The industry also deals with overwhelming digital complexity across platforms, high communication latency between designs, and a strong need for on-demand intelligence. Chat-based interfaces function as unified portals that integrate knowledge management, enabling predictive insights and task automation. These interfaces are referred to as super apps because they are not only conversational but also provide interoperability across both legacy and modern systems. Such systems act as conversational chatbots that simplify daily tasks and support collaboration, going beyond answering questions and helping with generating reports, performing root cause analysis, and summarizing issues based on the provided context.

Agent AI, which is part of the broader evolution of conversational chatbots, is coming into the picture. Several companies are actively working on building these frameworks, which aim to enable chatbots to operate not just individually, but in synchronization with one another. This introduces a more complex system where chatbots must interact with each other in sync, enabling the emergence of conversational analytics. Such capabilities are particularly relevant in aerospace, where specific challenges require targeted solutions. Another area where it has the most impact is training and information access. They are also valuable in handling customer-related issues, enabling users to resolve problems efficiently.

Impact

Chatbots, when trained on operational data such as process capability metrics and historical non-conformance records, can play a transformative role in managing quality and compliance challenges. By learning from past issues and their resolutions, these chatbots can proactively flag risks, recommend corrective actions, and even trigger automated escalation workflows. Beyond operational efficiency, these systems can serve as digital copilots that enable real-time decision support, reduce dependency on tribal knowledge, and democratize access to critical insights across teams. As a result, organizations can shift from reactive problem-solving to predictive and preventive operations.

In the long term, chatbots could lead to leaner organizational hierarchies, redefined roles, and new service-oriented models, while in the short term, they can drive quick productivity gains. However, the adoption of such systems also introduces potential risks, such as a decline in human analytical capabilities. Over-reliance may reduce opportunities to deeply engage with domain-specific knowledge, where hands-on experience is critical, and there may be challenges in validating chatbot outputs effectively. To mitigate these risks, users must first gain domain expertise. The journey should begin with foundational learning, followed by the gradual integration of multimodal chat interfaces, and eventually, the ability to supervise and validate AI-generated outputs. Their integration must be balanced with human expertise to ensure safe, effective, and sustainable transformation in aerospace organizations.

Organizations planning to implement chatbot-based applications should first establish a well-defined data architecture strategy, complemented by robust knowledge management. Together, these elements ensure that the chatbot can access and process the necessary information to function effectively. If the data strategy is flawed, even the most advanced chatbot systems will struggle to deliver value.

Use Case

A major Aerospace and Defense industry player wanted an Assistant based on Gen AI technologies to speed up and simplify the retrieval of technical information from their manuals which was over 30K pages. Capgemini Engineering deployed its Virtual Assistant based on Natural Language Processing (NLP), Computer Vision (CV) and generative AI algorithms to extract, process, search and suggest questions on manuals. The virtual assistant allowed the creation of a Digital Knowledge Base of preprocessed documentation that can be navigated interactively. Also, it helped the users search for information across multiple documents and pages with its Search Engine and to Chat with documents' contents. This solution succeeded in simplifying and saving the time to acquire needed information from pilots, trainees and maintenance technicians, bringing a disruptive innovation into Technical Customer Support.

John Frederiksen

Pair programming with an AI assistant can significantly boost coding productivity and quality while steepening your learning curve — if you know what you're doing.

When Code Goes Know

What

While AI isn't new, the continued hype around generative AI has brought into sharper focus the range of possibilities AI can provide, particularly in the realm of software development. New and improved development assistant solutions have taken their place as the next generation of AI-enabled software development, augmenting developers by providing autocompletion, code and test generation, and high-level reviews. All of this is done through dialogue in plain, natural language. Gen AI-based solutions are built upon Large Language models (LLMs) that have been trained using the knowledge available from the open-source community and vast amounts of excellent, publicly available source code.

Impact

We are already seeing how these augmented software development solutions have the potential for far-reaching impact, across the entire Aerospace and Defense industry. The biggest impact of augmented development is increased productivity and enhanced organizational agility through a significantly faster time-to-market for new business and support applications and a faster learning curve for junior software engineers. In the face of continued scarcity of specialized software developers, such solutions allow employees across the board to test out ideas and spark innovation, without needing decades of software development experience to get started.

However, they must be used with caution. An experienced eye remains crucial for validation and optimization of results as inexperienced developers simply do not have the skills to spot nuanced, but impactful flaws, in the generated code. This is not a one-size-fits-all approach, critical and complex code requires rigorous validation processes in place before such solutions can even be considered for use. Within Aerospace and Defense this is especially important in systems that impact operational safety.

Use Case

Gemini Code Assist is an AI-powered development assistant designed to enhance productivity and collaboration in software engineering. Integrated into popular IDEs like VS Code and IntelliJ, it supports developers by generating code from natural language comments, suggesting real-time completions, and explaining complex logic. Acting as an AI pair programmer, Gemini Code Assist enables a fluid, conversational workflow where the developer guides the process while the assistant handles code generation, testing, and debugging. This dynamic mirrors traditional pair programming, with the AI often taking the "driver" role and the human developer acting as the "navigator."

Ravikanth Pasumarthy

Next-generation agile applications, built on the concepts of Microservices, API first, Cloud-native, and Headless, make up an applications portfolio that is continuously tidied.

Honey, I Shrunk The Applications

What

Innovative software solutions are transforming connectivity and networking in aerospace and defense. Advanced frameworks now facilitate non-terrestrial networks, ensuring seamless connectivity from ground stations to satellites. This software-driven approach supports applications by providing robust computing power within these frameworks. In defense, comprehensive wireless and wired networking capabilities are enabled through sophisticated software solutions. Initiatives like Defense Advanced Research Projects Agency (DARPA) are driving algorithmic innovations, further enhancing the capabilities of these defense frameworks. In space, we see increasing interest in space exploration, with major projects like NASA's Artemis program aiming to return humans to the Moon and Mars. Software solutions play a crucial role in this mission, providing connectivity through Low Earth Orbit (LEO) and Geostationary Orbit (GEO) satellites. These satellites, equipped with advanced software, offer terrestrial-like connectivity in space, ensuring continuous communication and computing power.

Over time, AI and machine learning applications will extend into space. These applications will analyze data to uncover new trends and possibilities and will facilitate the discovery of new potential in space, driven by data analysis and continuous connectivity.

Impact

The strength of these innovative solutions lies in the ability to update and upgrade systems remotely through software, eliminating the need for physical retrieval of equipment. This enhances efficiency and aligns with the broader trend of achieving comprehensive, software-driven connectivity beyond Earth. The vision is to make space more accessible and interconnected, leveraging software to extend the reach of networks into the final frontier. You could say "Honey, I Took the Connectivity Beyond Earth"! In the future, satellites will likely be equipped with greater computing power to process data locally. This capability will enable them to handle some complex tasks onboard, rather than transmitting all raw data back to Earth for processing. This approach not only saves bandwidth but also ensures more immediate and efficient data utilization.

Use Case

The Capgemini Software Framework Solutions (SFS) for Networks offers software frameworks such as centralized unit (CU), distributed unit (DU), core, RAN intelligent controller (RIC), and service management and orchestration (SMO) that allow Satellite Communication (Satcom) providers to launch their products quickly in this competitive market. The solution is already compliant with 3GPP and has been tested with industry trusted simulators for channel and Doppler variations, as well as 3GPP Release 17 for compliant User Equipment (UE). Capgemini is involved in the Satcom journey from design and architecture to deployment and post-deployment support services.

Mike Dwyer

Robots are no longer just machines — they're programmable, intelligent agents, adding new dimensions and opportunities to the craft of software engineering.

App = A Robot

What

This isn't just about automation—it's about building digital helpers that drive productivity.

The "App = A Robot" trend is all about creating intelligent, friendly agents that help us get work done efficiently and intuitively – aerospace robots or "aerobots", if you will. These agentic capabilities are designed to simplify your day-to-day tasks by helping you assess risks, identify the next steps, and respond quickly to program needs. This isn't just about automation—it's about building digital helpers that drive productivity. While creativity-focused AI (like copilots for scientists or engineers and meta-humans for learning and support) supports innovation, these task-oriented agents focus on speed, accuracy, and trust in routine workflows—like filling out forms, managing approvals, or tracking logistics. There's a subtle but important distinction: **productivity vs. experiential, learning vs. creativity**. All three are essential, and they are being transformed by AI.

Agentic and generative capabilities can significantly boost productivity and speed, but they must operate within a **framework of safety, reliability, and accountability**. In A&D, it's never just about efficiency, it's about doing the right job, with the right data, at the right time. One of the biggest challenges is building trust in technology. While younger generations and newcomers may adopt these tools quickly, they often don't fully understand what's happening behind the scenes. The cultural pendulum must swing carefully. Blind trust in technology can be risky. Instead, we must remain aware of what AI is doing, how it augments our work, and where its limits lie. Decisions in A&D carry real consequences whereby trust must be earned—and continuously monitored.

Impact

There are two sides to this: one is to make day-to-day work more efficient and accurate; the other is to design the best possible operational product or system. Repetitive, error prone tasks can be mitigated by aerobot capabilities, which continue to evolve and improve data accuracy and workplace productivity. These aerobots are designed to eliminate non-value-adding activities. The goal is to do things once, do them right, and have intelligent support systems in place to validate and process them efficiently. With aerobots assisting in completion of tasks using known parameters and suggested characteristics, we can ensure data is correct at the source. At a broader system level, this leads to more consistent and reliable trusted data, which can be compared and analyzed much more effectively. Historically, data quality has always been a concern, but aerobots can now help identify and correct errors. With the right safeguards and guiderails in place, language model–powered systems can help us move toward a future where data entry is not only automated but also trusted by default.

Aerobots can also support a faster pace in training and supporting employees on their journey to be more productive and to bring tangible experience to life accurately and in an engaging manner. Many new entrants to the world of aerospace and defense are staggered by the lack of digital assistance, and to retain these talented people we must get on the front foot to help them be "job ready" and sustained when they enter the workplace. The use of aerobots to create awareness and build insight into collective experience and knowledge is now mission-critical.

In the long run, especially when considering sustainability, it's important to strike a balance—are we building a better aircraft or platform, solving CO2, material sourcing, at what environmental cost in terms of digital compute power? It's a question of weighing benefits against potential harm. Aerobots significantly enhance productivity and help identify issues earlier, particularly in areas like fleet monitoring, supply chain and logistics resiliency. These kinds of insights support smarter decisions, all based on real-time data.

The distinction between aerobot technologies and generative AI lies in their shared purpose: enabling productivity and skills progression while accelerating time to market and developing complex product and systems designs. Aerospace and defense organizations and practitioners have a unique global opportunity to adopt these technologies and remain competitive. If they don't, the long-term consequences could be significant. Flying may become economically unsustainable, from reduced equipment market share to increased global competition; and defense products could become prohibitively expensive due to overly complex requirements and a lack of automation in design and manufacturing. That kind of economic pressure would have real social consequences. I often think back to my own experience growing up, flying regularly on a 747 from London to Colombo to visit family. It was affordable then, and we, as today's leaders, have a responsibility to ensure that such opportunities remain open for future generations.

Use Case

Capgemini's ELLEM is an immersive, mixed-reality generative AI companion designed to revolutionize human-machine interaction through holographic and multimodal experiences. Developed in collaboration with HYPERVSN, ELLEM is a life-sized, AI-powered digital avatar that embodies industry-specific knowledge and operates securely on-premises, in the cloud, or onboard. It leverages advanced AI models, including Retrieval-Augmented Generation (RAG), to deliver real-time, intelligent responses in natural conversation. ELLEM is not just a demo—it's a hands-on, tangible Gen AI solution that enhances productivity, accelerates processes, and showcases the future of trustworthy, human-centric AI in enterprise environments.

Invisible Infostructure

- Cloud Encounters of the Third Kind
- Everything, Everywhere, All At Once Connected
- Ok Qompute
- Ops, AI Did it Again
- Simply the Edge

Rob Kernahan

With the cloud evolving and maturing, it's time to create a new, smart mix of sovereignty, sustainability, agility, deployment options and specialized capabilities.

Cloud Encounters of the Third Kind

What

Once upon a time, the cloud was a relatively straightforward concept—on-demand and similar offers across suppliers. But cloud providers have now woken up to the fact that they must become more sophisticated to unlock the full potential market. To do this, the cloud market is now evolving to respond to increasingly complex demands, one of the most immediate being sovereignty. How suppliers adapt to these complex needs is creating a fascinating divergence in the cloud landscape. While this divergence has been brewing in the background for a while, we're now seeing a move to execution with Hyperscalers betting big multibillion budgets.

During this cloud evolution, AI is becoming the ultimate differentiator and the killer app for moving to the cloud. It will drive the next wave of cloud consumption. AI is changing our experiences, integrating into our everyday lives. From the lovable but limited 'paper clip' 25 years ago, these companions have dramatically evolved into agents we can directly talk to in conversation. Enabled by multi-model AI, these enhanced interactions are developed and deployed on the cloud. Without the cloud's power, capabilities and flexibility, we would be stuck with stationary, dull companions.

Impact

Organizations must now learn to navigate this new cloud landscape, where the myriads of new offers can be daunting and complex to understand but offer great potential. However, with increased focus on supply chains resilience, regulation and sovereignty, we must start to think more deeply about macro topics such as operational, legal and data aspects of cloud and seek to balance risk and benefits - our pendulum swings between risk and rewards. The awareness of the supply chain, particularly regarding sovereignty and sustainability, has never been more acute. Growing divergence means organizations face the decision of whether to remain cloud agnostic (at a hefty price) and miss out on exciting new technologies, or accept vendor attachment.

Use Case

AWS European Sovereign Cloud is an exciting initiative by Amazon Web Services (AWS), aimed at addressing data sovereignty and regulatory compliance within the European Union. This new cloud offering is designed to help government agencies, regulated industries, and independent software vendors (ISVs) store sensitive data and run critical workloads on AWS infrastructure that is operated and supported by AWS employees located within the EU.

One of the most significant aspects of this initiative is AWS's commitment to investing 30 billion euros over the next five years to develop and expand the European Sovereign Cloud. This substantial investment underscores AWS's dedication to enhancing its cloud services in Europe.

Charles-Alexandre De Taisne

Connectivity has become the foundation of a hyper-connected world, seamlessly linking devices, industries, and ecosystems to drive unprecedented innovation.

Everything Everywhere All At Once Connected

What

Connectivity has significantly advanced to become the key enabler for various applications in Aerospace and Defense. The shift from Wi-Fi to 5G in recent years, which offers better reliability, lower latency, and higher throughput, is crucial for applications that require consistent and high-quality service. Additionally, the emergence of satellite connectivity, particularly with the advancements brought by Low-Earth Orbit (LEO) constellations, has further enhanced the possibilities for global connectivity.

In the defense sector, 5G enables trunking for fleets, where data from maintenance sensors can be offloaded before equipment (e.g. ships or tanks) return to base, thus streamlining maintenance operations and supply chain processes. On the battlefield, 5G mesh technology is enabling the creation of tactical bubbles, ensuring continuous connectivity even if one point is lost. Moreover, the integration of AI and machine learning with 5G connectivity allows for advanced applications like real-time detection of allied or enemy forces using AI at the edge.

Away from the front line, connectivity also extends to manufacturing and production. The combined use of digital twins, AI, and 5G can enhance production efficiency, track and trace assets, and improve overall supply chain management. This is particularly relevant given the volatile geopolitical situation and the need for rapid production and deployment of equipment, both for civil avionics and defense.

However, there are significant challenges related to cybersecurity in maintaining secure 5G signals. The potential for jamming and interference with 5G signals is a critical issue to be addressed, to ensure continuous and secure connectivity. Furthermore, with the increased use of 5G-NTN (Non-Terrestrial Networks) connectivity, ensuring the secure transmission of data becomes paramount. This includes protecting data from interception and unauthorized access during transmission between satellites and ground stations.

Impact

Everything, Everywhere All at Once Connected encapsulates the transformative impact of advanced connectivity technologies like 5G and NTN on the Aerospace and Defense industry. These technologies enable new use cases, improve operational efficiency, and support critical applications, but must be used wisely by addressing the challenges of cybersecurity, integration and sovereignty.

Recent advancements are bringing us closer to what might seem like science fiction, with scenarios where jets could have their own fleet of 5G-connected drones to protect them. These drones are controlled by an edge computing system inside the plane, using data from cameras and sensors to make real-time decisions. While this might sound like something out of a Star Wars movie, it is becoming a reality with the current technological advancements. This trend is not just about building more sophisticated systems but about enhancing the capabilities and operational efficiency across the Aerospace and Defense industry. This integration of advanced technologies is making the Defense sector, in particular, more innovative and effective, pushing the boundaries of what is possible.

Use Case

The IRIS² (Infrastructure for Resilience, Interconnectivity and Security by Satellite) Satellite Constellation is the European Union's third flagship, addressing long-term challenges of EU's security, safety and resilience by offering enhanced connectivity services to governmental users. The new multi-orbital constellation of 290 satellites will combine the benefits offered by Medium Earth Orbit (MEO) and Low Earth (LEO) satellites. It is set to provide secure connectivity services to the EU and its Member States as well as broadband connectivity for governmental authorities, private companies and European citizens, while ensuring high-speed internet broadband to cope with connectivity dead zones.

Mark Chang

From the Quantum Core to the Stars - We stand on the cusp of a digital transformation for Aerospace and Defense, one driven both by innovation in technology and a strategic necessity. This is the need for an invisible infrastructure.

Ok Qompute

What

The concept refers to an autonomous, energy-aware and resilient-by-design substrate upon which we act. At the heart of this transformation lies quantum computing. Unlike classical systems that scale linearly, quantum systems offer exponential performance in solving optimization, cryptographic and simulation challenges that underpin many modern operations. In some situations, classical computing is unable to produce a solution while quantum computing can.

Realizing the full promise of quantum computing requires an orchestrated transition —from today's cloud-first models to integrated cloud and Quantum Computing (QC) stacks. However, quantum computing is not just another layer – it is the core computational fabric for problem sets that are beyond conventional computing abilities.

The next generation engine

QC is poised to revolutionize how mission-critical decisions are made, how systems are secured and how the physical world is simulated and optimized. We have demonstrable evidence that quantum optimization radically enhances mission planning. This benefits satellite communications routing across multi-satellite networks, information logistics and can extend to constellation coordination by evaluating massive decision trees in parallel. Where classical systems iterate, quantum systems entangle and solve.

In an age of cyber threat escalation and looming post-quantum risks, quantum-safe communications become essential. Technologies like currently applicable Post-Quantum Cryptography (PQC), or innovation level Quantum Key Distribution (QKD) offer enduring secrecy and robust protection against future decryption by adversarial quantum machines, with the proviso that they are kept up to date.

Quantum simulation will enable modeling of exotic materials, propulsion systems and atmospheric conditions. All these points are critical to next generation aerospace design and hypersonic flight stability.

Impact

From compute to qompute

Cloud computing has powered the last decade of digital transformation, delivering flexible storage, rapid application deployment and scalable analytics. Unfortunately, its architecture is not designed to integrate quantum computing, as it lacks the low-latency, high-fidelity environment needed to interface with quantum processors and highly specialized workloads. It is most practical to think of this as "small volumes of quantum state data in" followed by "quantum computation", with a final "small volume of classical data out" as a result. We expect improvement over time, but it is a useful concept for today's capabilities.

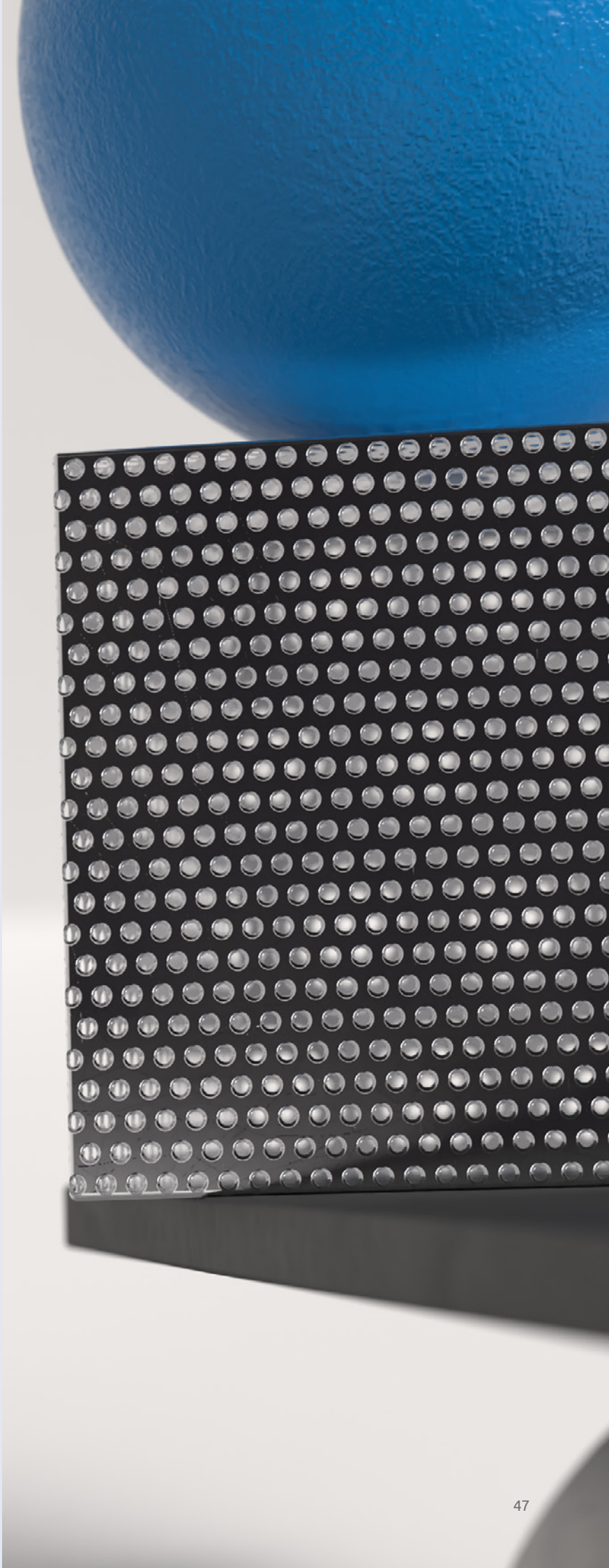
Bridging technologies are necessary to bring classical and quantum computing together; we envision this as a flexible interface that is modular and distributed. Examples might be specialized quantum control systems or federated and hybrid cloud platforms.

Qompute at the core of the invisible

Quantum computing is not the end goal, rather it is the starting point for a new kind of infrastructure. This must be energy-efficient, self-adaptive and deeply embedded into our digital space architectures. We see it as part of a converged, post-classical computing ecosystem underpinning aerospace and defense from the quantum core to the stars.

Use case

The computational demands of ESA Sentinel satellites' data processing, archiving, and dissemination require scalable, efficient, and innovative solutions. While cloud computing-based services currently address present-day needs, integrating high-performance computing systems and planning for the next generation of quantum computers into specific workflows could unlock a new level of industrial-scale capabilities: reduced processing times, faster data turnaround, and lower CO2 emissions. Leveraging these advanced computing infrastructures as a service allows for optimized data storage and access, enabling long-term strategies that prioritize essential data products and enhance operational efficiency. Next-generation quantum computing holds the potential to redefine Earth Observation data workflows by offering breakthroughs in solving complex or intractable problems. We studied the evolution of these technologies from research-driven concepts to industrial solutions. We explored the tangible benefits, associated costs, and pathways to operationalization for Level-0 to Level-2 data processing, operations, and archiving in support of current and future Sentinel missions.



Felix Balhorn

AI renders IT operations fluid, proactive, and resilient, improving efficiency, sustainability, and reliability while it learns — on its way to a handsfree, 'NoOps' autonomy.

Ops, AI Did it Again

What

Artificial Intelligence holds transformative potential for the Aerospace and Defense industry, which traditionally experiences long development cycles and stringent technology readiness levels. AI can accelerate these processes through optimization and advancements in language processing and Large Language Models (LLMs). While human expertise remains crucial, AI complements and enhances the efficiency of these processes, potentially revolutionizing the industry's operational landscape. One of the most significant aspects of AI in the A&D industry is that nothing should be excluded from its influence.

While humans may be reluctant to let AI handle tasks, it's important to recognize that AI performs a fundamentally different role. AI can analyze numerous data points simultaneously and process vast amounts of data beyond simple statistics, addressing complex patterns and problems. AI's impact spans design, simulations, and enhancing collaboration among experts. Organizations are responding to this transformative power by establishing Centers of Excellence and integrating AI into their structures, making these exciting times for the industry. The trend of AI is propelled by several key technologies and innovations. The steady reduction in the cost of computing power has made advanced AI more accessible, while the availability of powerful computing resources enables more complex AI applications.

Additionally, the development of AI-specific hardware, such as AI chips and compute units designed specifically for AI tasks, has significantly contributed to this trend. Gen AI has been demonstrated to be a game-changer. It is proving its worth across the entire value chain with significant use cases like Documentation and Reporting, Compliance and Regulation, and Natural Language Understanding especially in the defense context by improving situational awareness and expediting the analysis of defense scenarios.

Talking about how Gen AI is evolving from AI, we can say that Gen AI introduces a transformative capability: generating diverse types of data and content beyond text. Gen AI is distinguished by its ability to handle and generate various forms of data, including 3D models, imagery, and complex reports that integrate hybrid data such as charts, tables, and explanatory text. This versatility allows Gen AI to support a wider range of applications, from designing intricate systems to simulating complex scenarios.

Moreover, today Gen AI leverages fine-tuned models and sophisticated supporting algorithms to deliver exhaustive and accurate outputs quicker than traditional AI systems. This efficiency reduces the burden on human operators, who remain in place to validate the AI's outputs. The generative AI capabilities also offer greater degrees of freedom and power compared to traditional AI methods. This generative aspect is the game-changing component, enabling AI to move beyond mere data analysis to actively produce useful and innovative outputs. Over the course of 2024 and into 2025, we have seen an increase in model reasoning capabilities and enhanced multi modal AI capabilities.

Impact

Advancements in Gen AI are reshaping organizations by emphasizing the importance of effectively utilizing data. Organizations must harness their data assets through Gen AI, which brings challenges earlier than expected, pressuring them to scale up, digitize, and become more data-driven. This shift necessitates equipping the workforce with the skills to manage and leverage AI technologies. Consequently, companies are creating more data-centric roles and departments, even at the executive level, to address the evolving trends and demands brought by Gen AI and prepare for the future.

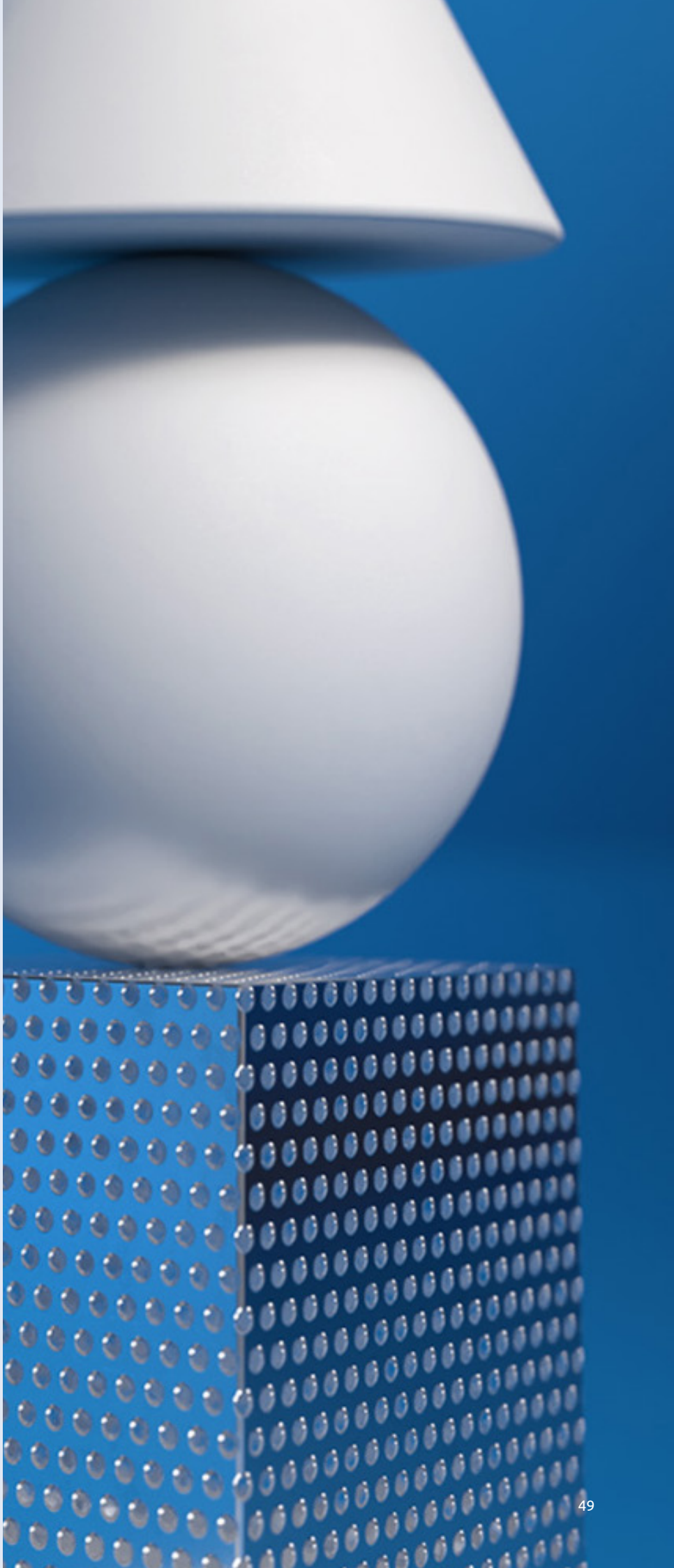
The immediate impact of AI on businesses, industries, and society is that it unlocks investments in AI that were previously withheld or delayed, leading to an increase in efficiency in business processes and helping

companies become more competitive. It can also impact society by influencing how we interact with companies and AI, potentially raising user and operator expectations. In the long term, the impact of AI is expected to be even more significant than we can imagine today. With AI's ability to continually improve and the ongoing advancements in computing power and cost-effectiveness, there seems to be no hard limit to the quality of models that can be achieved or the tasks that can be automated.

Organizations may face several challenges when adopting this trend. Firstly, there is often a technical department that needs to be addressed to ensure the organization is equipped to handle AI effectively. Secondly, there is a challenge in deciding the right timing for adoption, as there is often a feeling of 'being late to the party'. It's crucial to define clear milestones along the journey and understand the role and risks involved. From a sustainability perspective, the use of AI can lead to increased energy consumption, which is why organizations must ensure that they use renewable energy sources to mitigate these impacts and fulfill their ethical responsibilities.

Use Case

An example from the defense industry involves the implementation of LLMs or multi modal AI in communication and reconnaissance systems to enhance natural language understanding in voice commands, chat interfaces, image/video interpretation and written communication by quickly generating human-readable messages from the received information. This can be valuable for command-and-control systems, improving the efficiency of communication between personnel and automated systems and resulting in significant time saving in the operation and the involved human-based decision-making.



Christophe Gaube

Intelligent devices, at the 'edge' of central IT and close to operations and OT, add a powerful dimension to the existing IT infrastructure — merging virtual and 'real' worlds.

Simply the Edge

What

When we delve into the realm of 5G, we soon realize that processing, storing, and deriving information from data is crucial. Data serves as the foundation, enabling the development of new capabilities. Military operations, however, don't occur in controlled environments; they are subject to various constraints. For instance, at the edge, there are limitations in terms of weight and capacity. This necessitates solutions that are compact and power-efficient, given the constraints of carrying equipment in vehicles, backpacks, or vests. Urban environments further emphasize the need for portable solutions, as constant access to large equipment isn't feasible.

This underscores the importance of size, weight, and power considerations, including battery life. Processing power and storage capacity are also crucial factors. The last factor to consider is transmission, especially when disconnected. In the civilian and commercial spheres, 5G has emerged as a reliable transmission technology, capable of handling large volumes of data. 5G excels in latency, data rate, and power efficiency, and supports various applications such as AI, machine learning, cloud infrastructure, and security. In 2024, there was significant progress in recognizing the potential of 5G technology in military applications. For example, advancements have been made in reducing detectability and ensuring data transmission even in situations where continuous connectivity is not guaranteed. Machine learning and the increasing need for AI on the battlefield help facilitate faster and better decision-making. This is where 5G technology plays a pivotal role. It enables enhanced data distribution and information sharing, allowing for quicker and more informed decisions. By leveraging 5G, military operations can achieve greater efficiency and effectiveness, ensuring that resources are used thoughtfully. Whether on the battlefield or in infrastructure supporting military operations, 5G offers a versatile and powerful toolset. One key advantage is 5G's ability to maintain connectivity in fast-moving (unmanned) vehicles, enabling information sharing on the move. This mobility and connectivity are unmatched. As more systems of systems enter the battlefield, data transmission and information sharing grow increasingly important.

Impact

5G has a significant impact on various aspects of defense operations, especially in command and control, logistics, and maintenance, where it enables the collection and transmission of vast amounts of sensor data. Major Defense Original Equipment Manufacturers (OEMs) with their commercial fleets are collecting terabytes of data. This data is processed on the edge, within the aircraft, with only essential information transmitted during flight or upon landing for further analysis or software upgrades. For platforms like tanks, continuous data collection is crucial. When these platforms return to the depot or barracks, they need to offload the accumulated terabytes of data for analysis, bug fixing, and software upgrades. 5G plays a vital role in this process, allowing for quick, efficient data transfer. The defense industry has much to gain by adopting a more software-centric approach. Shifting towards software could speed up capability development, open new business opportunities, and revenue streams. These advancements are driving the industry forward, emphasizing the significance of features like low energy consumption, excellent latency, compact size, and lightweight design, regardless of whether it's 5G or 6G. Among challenges, a key 5G security concern is ensuring independence from low-quality, vulnerable products and chips. This issue is critical, as it impacts both sending and receiving data, making it a potential entry point for cyber-attacks.

Use Case

The U.S. Army chose wearable AI computers from Tomahawk Robotics to improve battlefield medicine. These devices are designed to help soldiers make quick, informed decisions and can document patient care without needing a network, running at the edge.

Balance By Design

- Be Like Water
- Technology ∈∋ Business
- Trust Thrust
- No Hands on Deck
- augment ME!
- Do Good, Do Less, Do Well
- Real <-> Smart

Benjamin Schulte

Ensure the built-in 'water-like' capabilities of agility, flexibility, responsiveness, resilience, and openness.

Be Like Water

What

Both Aerospace and Defense companies as well as Ministries of Defense need to Be Like Water and adapt to a new industrial paradigm and a fundamentally changing future operating environment. We are currently witnessing the shift within the Aerospace and Defense industry towards software-defined defense, meaning that future capabilities encompass not only the physical platforms such as fighter jets but are increasingly driven and defined by the software capabilities that unlock informational superiority and faster decision-making. This innovation increasingly occurs outside the confines of the traditional defense players, in research labs, startups, and technology firms. Future capabilities will therefore be created and integrated not by a single player but by a whole innovation ecosystem. Defense organizations need to learn how to adapt – akin to the fluidity of water – and integrate innovations rapidly into military capabilities.

Impact

Venture-backed startups are increasingly introducing proactive, product- and need-focused business models that challenge established practices in the Aerospace and Defense sectors. Their speed, adaptability, and focus on solving operational problems are reshaping the competitive landscape and redefining how defense innovation is conceived and delivered.

In this evolving environment, defense innovation is being driven by close collaboration with defense and dual-use startups, which are at the forefront of technological advancement. Innovation cycles have accelerated dramatically—often just two to six weeks—prompting significant changes in defense planning and procurement. Products deployed in the field must now evolve continuously, guided by real-time operational feedback. This requires tightly integrated feedback loops between end users and R&D teams. In response, new "real lab" test centers are emerging—dedicated environments where startups can work directly with operational units to test, refine, and deploy solutions with unprecedented speed and flexibility.

Use Case

Capgemini is actively partnering with leading dual-use startups to accelerate the infusion of cutting-edge innovation into the defense sector. Collaborations with pioneers such as Blackshark.ai demonstrate how advanced technologies can be rapidly adapted for defense applications. To further strengthen this ecosystem, Capgemini is supporting the next generation of dual-use ventures by partnering with the BASED initiative—an ambitious effort to develop Europe's next defense unicorns. Through these strategic alliances, Capgemini plays a critical role in bridging the gap between commercial innovation and defense needs, fostering a dynamic environment where startup agility meets operational impact.

Denis Dallez

Move from alignment to unity of business and IT, creating a seamless technology business of strategy and operations, compliant with the new now.

Technology ∈ Business

What

The continuing New Space era represents a perfect example of how a changing landscape can give rise to a new unity between technology and business. Defined by new players, services and business models, this era has enabled greater innovation, opening the doors for other sectors to leverage Space technologies, coined Space Tech, to develop business. Interest from private investors, particularly driven by GAFAM, has opened the playing field in Space, sparking curiosity and interest in the development of new commercial Space services. A growing ecosystem of new actors, including many start-ups and scale-ups, are bringing new services based on Space Tech to other industries, allowing them to leverage Space Tech in new ways within their sectors. This opening up of Space Tech for use across all sectors, coined 'Space for All', is bringing business opportunities to be seized today and over the long term, that are in turn driving innovation in technologies. In 2025, the Space Tech swing continues towards software design, with virtualized hardware providing greater flexibility and configurability for businesses to adapt and evolve. A significant step-change from legacy systems that have been in operation for decades.

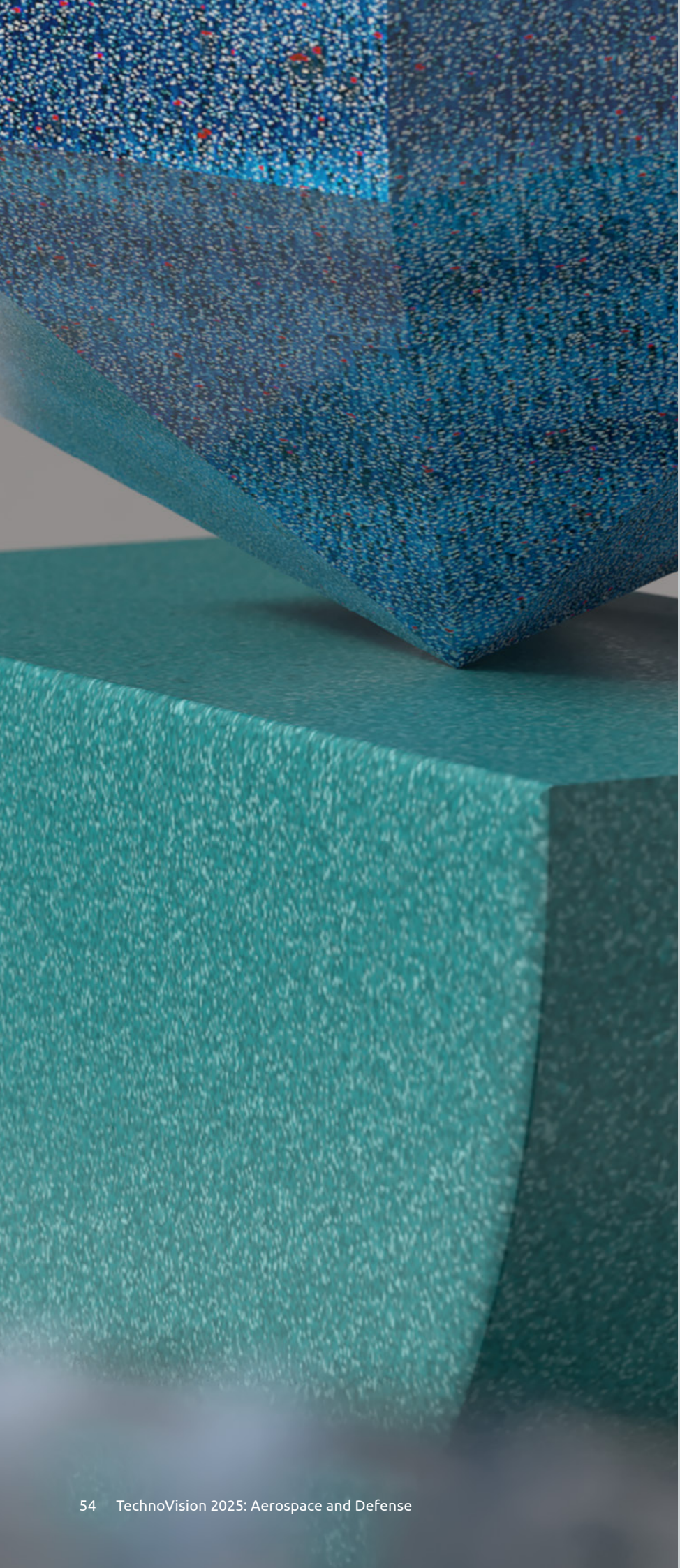
Impact

We continue to see many use cases where Space Tech is enabling better business processes. For example, Non-Terrestrial Networks (NTN), combined with IoT devices and/or 5G networks bring global end-to-end coverage, even in remote locations. In supply chain, we see IoT satellite-enabled devices used for track and trace across the global supply chain anywhere in the world. In connectivity, large-scale constellations bring high-speed, low latency broadband on a global scale.

Back on the ground, Earth Observation data will continue to be critical in the fight against and mitigation of climate change. In the coming years, the European Space Agency (ESA) will launch updated next-generation satellites for its existing Sentinel missions. Launched last year, the next-generation Sentinel-1C satellite is already providing promising initial results and joins the legacy Sentinel-1A (launched in 2014) to provide essential data. This is a good example of how next-generation technologies, essential for the constellations of the future, are evolving side-by-side with legacy systems, still in use and continuing to provide valuable data.

Downstream in insurance, we already see Earth Observation data providing additional data and insights to enhance risk assessment and improve damage assessment. The challenge, particularly with the exponential use of AI, will be ensuring the integrity of the data for end-user services. Ensuring traceability to prove that the data hasn't been tampered with and is true.

With an ever-increasing number of satellites being launched into orbit to respond to new business demands, manufacturing and engineering processes in the space sector must transform to keep up. Manufacturers are now building constellations with thousands of satellites, rather than lone satellites, pushing the industry to adopt smart processes and intelligent industry practices. And not just for satellites, the availability of reliable launchers is critical to avoid delays in bringing services online. While production levels are nowhere near those of the automotive sector, the space sector can learn from intelligent industry practices to drive the transformation required. The ramp up in satellite launches and increasing public awareness is bringing greater scrutiny on the sustainability of space activities, which has traditionally held a poor reputation. On



a terrestrial level, sustainability concerns are driving innovation in launchers, whether it be reusable launchers, like those developed by SpaceX, or adapting to more sustainable fuel sources. In orbit, the lifecycle management of satellites has come into focus, with ever increasing concerns in the levels of Space debris. Several New Space actors are developing services to either remove debris or enable satellite maintenance in orbit.

Use Case

The Amazon Kuiper project has the objective to increase global broadband access via a constellation of 3,236 satellites in Low Earth Orbit (LEO), bringing fast broadband to remote communities that are more difficult to reach by traditional means. The launches will be provided by several providers (Arianespace, Blue Origin, SpaceX…) to reach the constellation size required. Amazon has also made the choice to include active propulsion systems, seen as a sustainable choice as it enables each satellite to actively maintain a safe distance from other spacecraft and therefore, avoid debris, rather than rely only on gravitational forces.

Lucy Mason

Power up the entire trust ecosystem, from the organization's core to its edges, securing your existing business and pushing forward to its next permutation.

Trust Thrust

What

Trusted, responsible AI use is at the heart of the next iteration of Aerospace and Defense capabilities. Increasingly, whoever has the AI 'edge' wins the battle. But to deploy AI safely, trust at the frontline is crucial. Human-machine teaming (working out how humans and computers can complement one another to be more than the sum of their parts) is the next frontier for defense. Advanced AI models and systems seem to 'think' and may act in ways which seem human-like, giving us a false sense of trust in them. But they can also hallucinate falsehoods and spread misinformation, with potential harmful effects. Humans have a natural tendency to anthropomorphize complex systems whose workings seem unclear to us: after all, the human mind is a 'black box' and we usually trust others to make sensible decisions, even when those decisions affect us. Even the language we use for AI – 'autonomy', 'agency', 'reasoning', implies a humanness to what it is doing.

But AI is very much not like humans, and as it becomes ever more complex and ubiquitous, we may find it doesn't always do what we expected or intended. On the other hand, some people will never trust an AI with a decision, and will waste time questioning and checking it, losing the tactical advantage. Requirements to maintain human oversight for the purposes of accountability are legally and ethically important, but at a cost of slowing down processes against adversaries who are not so constrained.

Impact

AI that is developed collaboratively with the end-users and tailored to specific purposes, is more likely to be aligned with users' goals. At every stage, the people involved in shaping and making choices that affect what AI does, need to be aware of their own potential biases and come from diverse backgrounds. We also need to refine our understanding of AI ethics and stop expecting AI to be able to deliver a level of perfection that no human could hope to match, before we can trust it. We should explore multiple solutions to problems in a transparent and systematic way, experiment with how one or more AI systems might work together to solve complex problems, and educate ourselves on when and how we can trust advanced AI systems, and when we should not.

Use Case

Capgemini UK developed an 'Innovation Joust' approach to gamify the development of novel approaches to client problems. We piloted this with His Majesty's Government Communications Centre (HMGCC), running a national security challenge in a 12-week joust tournament framework. The challenge was to enable UK national security and law enforcement to track and control physical technical assets globally, often in poorly serviced, remote areas with little infrastructure. They needed trusted, reliable solutions that were secure, discreet, could be remotely activated or disabled. They needed status tracking for battery level and tamper detection while not being connected to traditional cellular or internet connections and potentially in constrained environments (e.g. a container ship stack operating for over three years without maintenance).

Four teams from Capgemini competed against each other, culminating in a 'Dragon's den' style showdown in our Applied Innovation Exchange. Teams pitched concept demonstrators up to Technology Readiness Level 3 to a panel of senior judges. The approach allowed HMGCC to explore multiple parallel solutions in a secure environment, with two solutions now funded for further development.

Ramon Antelo

Assume full, hands-free, zero-touch automation as the default for all new Technology Business processes.

No Hands on Deck

What

We see the No Hands on Deck trend for Aerospace and Defense within manufacturing and supply chain, in particular the parts of operations that are poised to be fully automated, already being on the path to automation. The convergence of Operational Technology (OT) automation with machine learning (ML) and AI will significantly elevate process automation. Certain processes involving machinery (like tricep machinery or autoclaves for composites) will undoubtedly see increased automation over the next three years. However, some challenging environments, such as the interior of an aircraft fuselage, will present obstacles to robotic automation, and it is unlikely that we will see significant automation of these processes within the next three years.

Organizations are increasingly investing to adapt to this trend and technology. One notable approach is the collaboration between robots and humans, leading to more automated operations with enhanced robotics. Another is the adoption of ML and AI algorithms running at the edge to control processes, as an edge architecture brings many benefits for manufacturing companies: the possibility to run mission-critical operations when connectivity is compromised, extremely low latency to control processes that require it, and lower cost associated with cloud consumption. Many companies are testing new algorithms tailored to specific use cases.

What is new for 2025 is the application of Hybrid AI – the combination of generative AI with other models. This won't be in the form of Large Language Models like GPT but rather in the form of liquid neural networks for three main reasons:

- First, these models are easier to train and use far fewer computing resources. They can run on edge devices and servers, which accelerates the time to market for these solutions. With simpler training requirements, you can refine your algorithms more quickly and don't need expensive computing power to run them.
- Second, the accuracy of these models is significantly higher than that of GPT-like models, especially for engineering applications where precision is crucial. Standard GPT models are more general, whereas these liquid neural networks focus on engineering topics, providing more accurate algorithm results.
- Third, and importantly, these models are not black boxes; they are explainable. Engineers can understand and trust the results of these jelly algorithms, making them more practical for engineering use.

What makes this trend unique is its balance between automation and human involvement. In the A&D industry, while some tasks can be automated, many still need human input. Complete automation remains unrealistic, with significant hands-off operations unlikely within the next three years.

Impact

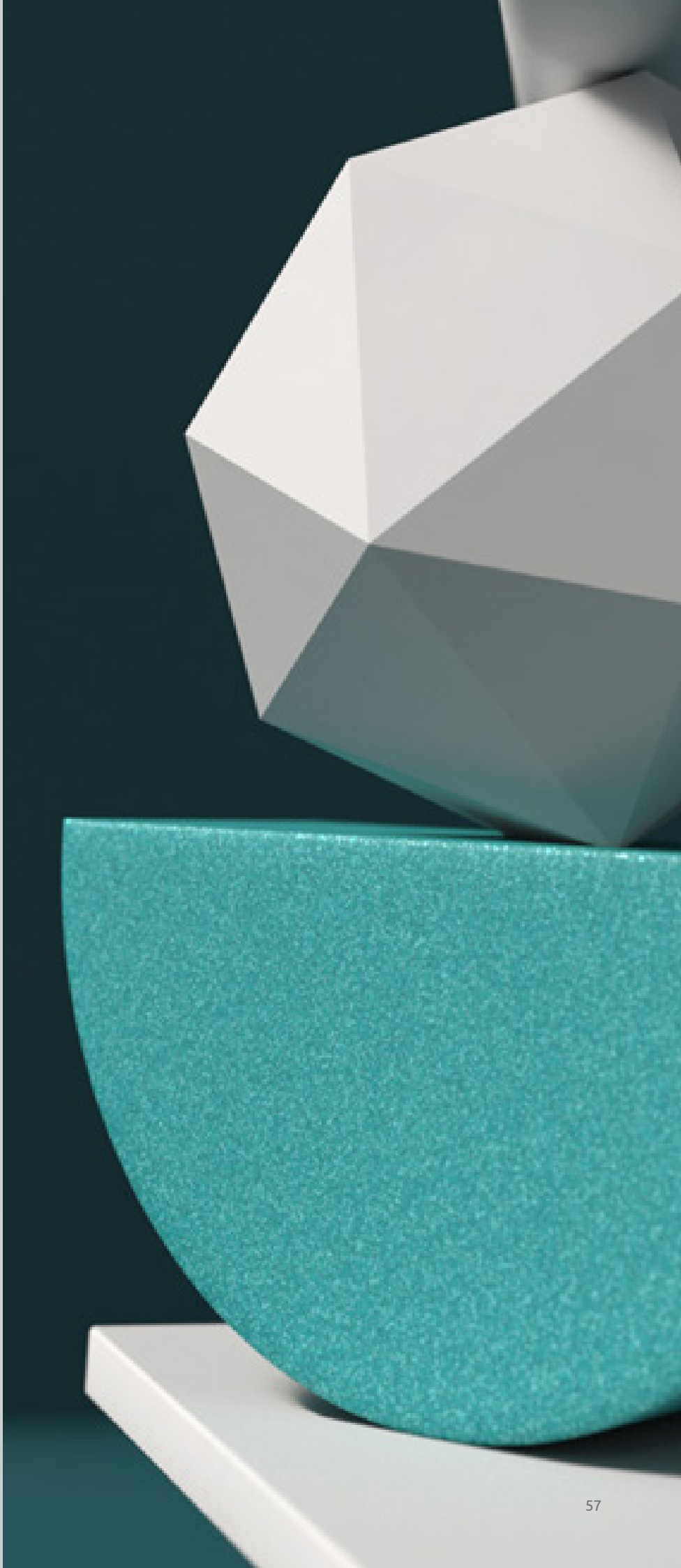
The impact of this trend and its transformative influence on organizations primarily manifests in two significant ways. First, freeing up highly skilled experts from repetitive tasks, allowing them to focus on more cognitively demanding work. Second, organizations must expand their ecosystems. It is nearly impossible for A&D companies to possess all the necessary knowledge and expertise internally. The convergence of different technologies requires access to top-tier resources in various fields of engineering. This means organizations must collaborate more extensively, even in areas that provide a competitive advantage, or what can be termed the 'enabling core'. These changes are driving a shift in how organizations operate, promoting a more collaborative and resource-efficient approach to harness technological advancements. In businesses, industries, and society, the immediate effect of this trend will likely be the repurposing of people from repetitive tasks to more cognitively demanding roles. It's not a sudden breakthrough, but a steady progression towards increased productivity. In the long term, this trend will lead to increased consistency in a way that reduces variability and enhances reliability.

In the long term, the coexistence of robots and humans will be crucial. Organizations will need to determine which tasks can be safely automated by robots and which tasks should remain human-centric. It's unlikely that within the next three to five years, humans will be entirely replaced; however, the presence of robots will increase, requiring thoughtful assignment of tasks between humans and machines. Adopting the trend, however, can be challenging for organizations that have not yet implemented such technologies. One major obstacle is the cultural mindset within the organization, which may be resistant to change and automation. Building trust in the automation process and its results is crucial, but takes time.

Additionally, implementing automation requires extensive planning, maintenance, and upskilling of employees to work with robotic and automated systems. Overcoming these challenges will require a shift in mindset, a commitment to training and development, and building trust in the new technologies being implemented.

Use Case

An aircraft components manufacturer wanted to have better control of their drilling and riveting operations for one of the control planes. Traditional ways of working required that all drills and rivets be manually inspected by an experienced worker, resulting in longer cycle times, increased cost and more variability. A machine learning algorithm, running on a 5G edge node, was developed to have continuous control of the process parameters, resulting in a significantly reduced number of manual checks after the operations and higher quality of the process.



Benjamin Schulte

Leverage rapidly emerging forms of AI-generated knowledge and insights, even in the absence of complete understanding and transparency ultimately applying a complementary, symbiotic form of judgment between humans and AI. Understand that one will never fully replace the other and strive towards mutual augmentation.

augment ME!

What

Modern defense operations are undergoing a deep transformation as traditional command-and-control models give way to AI-enabled systems that enhance and accelerate human decision-making. Military forces are no longer solely dependent on hardware superiority but are increasingly leveraging software-defined capabilities to gain a competitive edge. These systems for Intelligence, Surveillance and Reconnaissance (ISR) can analyze massive streams of data from satellites, drones, and field sensors, offering commanders real-time operational insights.

By embedding agentic and generative AI into core functions such as the Observe-Orient-Decide-Act loop — whole workflows from data fusion, threat identification and classification, generation of own course of action, predicting success based on environmental conditions and presenting commanders with recommendations for engagement can be automated with human in the loop. In doing so, armed forces are creating an adaptive digital backbone.

Impact

The shift towards intelligent mission support systems is significantly enhancing the speed, precision, and safety of defense operations. AI models trained on historical and real-time data enable faster, more informed decisions across multiple mission contexts. For instance, in ISR, unmanned platforms with edge AI can rapidly analyze terrain, detect enemy movements, and assess environmental factors. Simultaneously, these AI capabilities extend to military mobility and autonomous logistics, streamlining complex supply chains and supporting manned operations.

Moreover, AI-powered knowledge copilots are transforming the defense workforce by coaching and training personnel, providing instant access to critical information and vast documentation, and transferring the expertise of seasoned professionals to the next generation. This combination creates a force that is not only faster and more precise but also continuously learning and adapting in dynamic, high-risk environments, significantly reducing response times and operational risks.

Use case

Capgemini has designed and developed a voice assistant for a leading defense supplier, augmenting the existing maintenance application with a Gen AI powered copilot, allowing maintenance operators to interact and perform tasks without needing to remove their gloves and physically touch and type.

Julie Albert

Make your organization thrive by embracing initiatives that create a positive social and environmental value alongside economic value, while rejecting activities that damage the biosphere or destabilize society and compromise humanity.

Do Good, Do Less, Do Well

What

Sustainability within the aerospace industry encompasses various aspects, primarily focusing on commercial aviation. While defense remains a crucial sector, the spotlight is currently on commercial aviation due to its significant emissions. The primary concern revolves around reducing carbon emissions generated from aircraft operations, particularly fuel combustion. This requires a shift towards alternative propulsion methods and fuels. Different aircraft categories, such as vertical take-off and landing systems (eVTOLs), short-range, medium-range, and long-range aircraft, require tailored sustainability approaches.

Addressing material criticality is also essential, ensuring that materials used in aircraft construction are sourced and utilized sustainably. This encompasses not only reducing emissions but also adopting sustainable practices throughout the supply chain. This year we have seen a shift in attitudes towards sustainability with a move towards practical, short-term solutions rather than long-term, disruptive innovations.

Impact

Ultimately, achieving sustainability in aerospace requires a shift towards a holistic approach that considers both performance and environmental impact. This may involve trade-offs, such as sacrificing some performance for increased sustainability. However, it's essential to strive for a global optimum where aircraft are not only high-performing but also environmentally sustainable throughout their entire lifecycle. Sustainability in operations requires a 360-degree approach, addressing various aspects of resource and energy management. It's a complex but essential endeavor that requires continuous improvement and innovation. While the development of hydrogen aircraft has been postponed, there is a significant emphasis on Sustainable Aviation Fuel (SAF) and designing products that are sustainable by design. This pragmatic approach allows the industry to make incremental improvements that collectively contribute to sustainability.

However, one area that continues to push boundaries is the use of bio-inspired designs in aerospace, which although still in the research and development phase, are progressing steadily. These innovations draw inspiration from nature to optimize flight physics and improve overall efficiency. Airbus's new aircraft concept, which features movable wings, is an example of how biomimicry is being applied to create more efficient and sustainable aircraft.

This year presents a complex interplay of challenges and opportunities in the aerospace industry's journey towards sustainability. By focusing on practical, short-term solutions, the industry can still make significant strides in reducing its environmental impact while continuing to innovate and grow.

Use Case

Airbus is pioneering a transformative leap in aviation with its next-generation single-aisle aircraft. This innovation centers on a redesign of aircraft systems, incorporating advanced aerodynamics inspired by biomimicry to enhance lift and reduce drag. The aircraft will feature engines that consume 20% less fuel than current models, contributing significantly to decarbonization efforts. Lightweight yet durable materials will be used to construct the aircraft, improving performance and sustainability. These advancements collectively mark a bold step towards more sustainable air travel.

Julie Albert

Get real about being smart. To strike the perfect balance between genuine human ingenuity and shiny artificial brilliance, organizations need to think less about a quick fix and more about the long game.

Real <-> Smart

What

Artificial intelligence (AI) has the real potential to significantly contribute to sustainability by optimizing processes and reducing time. AI can streamline operations, thus supporting sustainability objectives by saving time and resources. However, its integration must be smart. There is a balance to strike between carbon emissions associated with AI, the cost savings it can bring and the readiness of the industry to innovate. This equilibrium is essential for making AI a viable tool for sustainability in aerospace and defense.

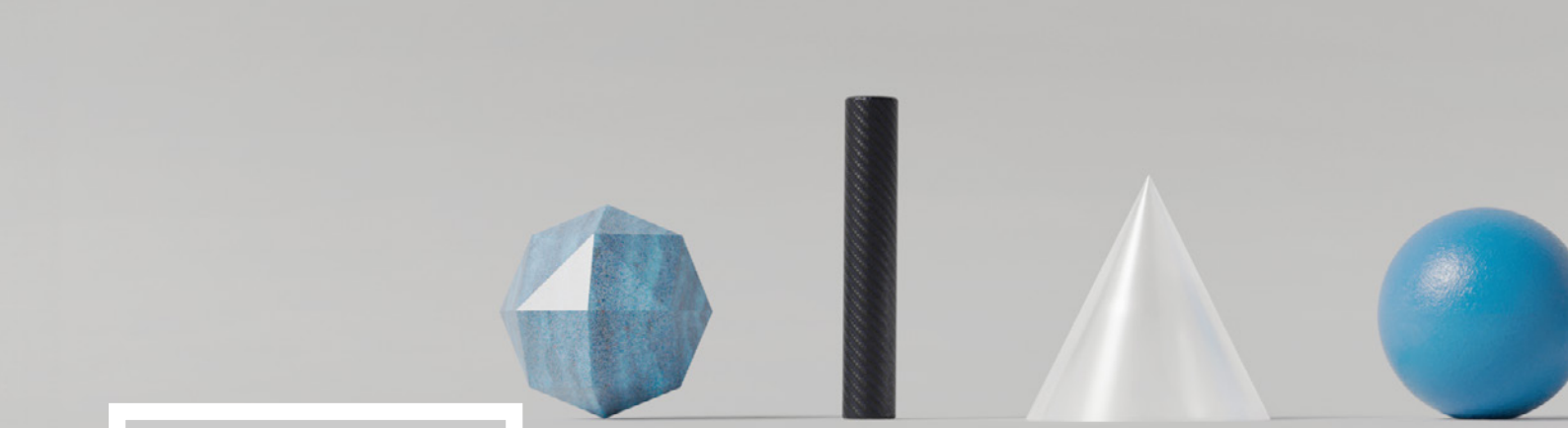
Impact

The current regulatory constraints make it difficult to fully leverage AI's potential in the aerospace industry. While AI can be used for preparation work, human intervention is still required for final certification. This is because the certification processes have not yet been updated to accommodate the extensive use of AI. These processes will need to be updated to ensure that new aircraft can be certified via AI. This is a significant hurdle that the industry needs to overcome to fully benefit from AI's capabilities.

By incorporating carbon pricing, the industry can better understand the environmental impact of AI and make more informed decisions. This approach aligns with the broader sustainability goals of reducing carbon emissions and promoting environmentally friendly practices. Combined with AI by design, which provides the tools to ensure that new developments in the aerospace industry are both efficient and sustainable, the industry can address the challenges to fully integrate AI and achieve long-term sustainability goals.

Use Case

Non-Terrestrial Networks (NTNs) promise to revolutionize the communications landscape, connecting businesses, people and machines across all environments. Traditional metrics like signal strength or throughput fail to accurately reflect user experience in NTNs, especially in dynamic or emergency scenarios. Capgemini's solution is an AI agent deployed as an xApp within an Open Radio Access Network (O-RAN) architecture that predicts user experience in real time using only standard Radio Access Network (RAN) data (Layers 1–3), enabling real-time resource optimization without compromising privacy. This delivers improved service quality and responsiveness in critical scenarios such as disaster recovery—where NTNs must prioritize emergency communications—while enhancing user satisfaction and optimizing resource allocation across the network.



A Few More Things… in Aeronautics

Frédéric Combes

Global Quality Excellence Leader, Aerospace and Defense

We're reaching a horizon moment in aviation — the kind that only comes once in a generation. For decades, aircraft design has evolved gradually, through careful, tested incremental innovations. But today, the aeronautic industry is on the verge of a major leap: the arrival of the first fully digital aircraft. This can be seen as a breakthrough innovation. The idea has been developing for years, and the pieces are finally coming together. Artificial intelligence is speeding up engineering decisions. Robotics are increasing precision and consistency in manufacturing. Vast streams of operational data are making the link helping to optimize performance, maintenance, and overall efficiency. For the first time, the entire aircraft lifecycle — from product development to industrialization to customer services — can be connected through a single, digital thread. This represents a competitive advantage for aircraft manufacturers that master it. So why hasn't the digital native plane arrived yet, especially when the technology is already within reach?

Because in aviation, no innovation moves forward until it's proven. That takes time (and for good reason!). Aviation safety regulators like the Federal Aviation Administration (FAA) and European Union Aviation Safety Agency (EASA) haven't yet approved aircraft designed entirely using digital processes or AI-supported tools. These systems must meet the same high safety standards that have made air travel the safest form of transportation.

The pace of change reflects just how deeply entrenched today's aircraft architectures are. Some of the most widely flown aircraft still operate on system architectures developed 40 to 70 years ago. Over the last decades, these aircraft have evolved, however their foundations remain because they've earned trust over decades of service. That trust is hard won and quickly lost if not properly managed.

That's why a digital aircraft must first prove itself not only to regulators, but to manufacturers, airlines, pilots, engineers, and passengers. Every element must show that it adds value and reduces risk, not just in theory, but in the air, under pressure, and in real-world conditions. Therefore, if we can prove safety, the impact will be profound.

The digital plane will change how aircraft come to life — from faster, model-based development to more automated, traceable production. In the air, it will function as a connected, intelligent system: continuously monitoring its performance, adapting to conditions, and anticipating issues before they cause disruption. Operations will become more efficient, and maintenance more predictive than ever. Pilots and crews will be supported by systems that reduce their workload and enhance overall reliability and safety.

We are almost there, and the next aircraft programs will leverage all technologies available. Keeping in mind that none of this will move forward unless it demonstrates meaningful, measurable value to the people who depend on it. Most importantly, it will carry with it the same level of confidence the civil aeronautics industry has built over generations — not because it's digital, but because it has been proven safer.

A Few More Things… in Space

Bruno Bouf
Global Space Lead, Aerospace and Defense

The space sector is entering its most disruptive decade yet, and the impact won't stay in orbit. Private players like SpaceX and Blue Origin have changed the economics of launches. Satellites are now smaller, cheaper, and faster to build. What once took years can now happen in months. Earth observation, navigation, and communications systems are being delivered as services — modular, scalable, and easier to integrate into digital platforms.

This disruption has opened the door to a new kind of space economy. As launch costs fall and commercial access expands, more private players are entering the market — not just building satellites, but delivering services, data, and infrastructure on demand. Space is shifting from a government-led, hardware-first model to a fast-moving, service-oriented industry, where value lies in digital platforms, not just what gets launched.

That shift has pulled space out of its traditional orbit. It's no longer reserved for national agencies or aerospace primes. It's becoming critical infrastructure. And for industries on the ground, that changes everything.

Agriculture companies are using satellite imagery to monitor crop conditions and manage irrigation in near real time. Autonomous vehicles depend on high-accuracy positioning signals from orbit. Global supply chains rely on satellite-based tracking to manage assets and optimize routing. Insurance firms are turning to space-derived environmental data to assess flood risk and accelerate disaster response. Telecom providers are expanding coverage through low-Earth orbit constellations, connecting regions beyond the reach of terrestrial networks. In this new paradigm, mastering the digital platforms enabled by space-based services will unlock further opportunities.

As more sectors build around it, the question of who controls that infrastructure also becomes critical. Economies are now deeply intertwined, which means sovereignty, security, and resilience are on the line. That's why Europe is moving quickly to secure its own capabilities. Programs like IRIS² are designed to create independent satellite networks that serve both civilian and defense needs — from secure communications to navigation and Earth observation. Beyond increasing capacity, these systems are meant to give Europe direct control over infrastructure that's becoming essential to how its economy operates.

In an era of disruption at this scale, the biggest challenge isn't just speed — it's coordination. With more players entering the space economy, and more industries depending on it, success will come down to how well we align. The systems being built now will only deliver their full value if they're designed to work together — across sectors, borders, and technologies. Space is no longer for the few. It's for everyone — and that makes getting it right even more important.

A Few More Things… in Defense

Benjamin Schulte

Strategy and Innovation Lead, Defense Europe

The empire hacks back. In an increasingly fragmented geopolitical landscape, the race for technological dominance is reshaping global power dynamics. As great-power competition intensifies, technological superiority becomes a prerequisite for sovereignty, deterrence, and influence. Defense is no longer solely about firepower or territorial control; it now hinges on who can develop, integrate, and deploy emerging digital technologies at scale and speed.

On the literal frontlines, we witness the effect of this shift. Innovation cycles have been reduced from years to days or even hours, resulting in accelerated cycles of innovation and counter-adaptation in the struggle for superiority and initiative.

Technology has emerged as both the terrain and the tool of modern warfare. Artificial intelligence, quantum computing, bioengineering, and cyber capabilities are transforming not just the tools of defense but its very foundations. The ability to incorporate these technologies into defense architectures is becoming a central determinant of national resilience. As a result, we are witnessing a strategic convergence: the once-siloed defense sector is opening up to new players, including startups, software companies, and venture capital.

Game of Drones. This technological convergence is most visible in the rapid acceleration of AI-enabled autonomy. In 2025, the development of unmanned and autonomous systems will reach a tipping point. Sophisticated drone swarms, unmanned surface vehicles, and unmanned ground systems are now being deployed alongside manned platforms, redefining the tempo and scope of operations. Importantly, this wave of innovation is not limited to new platforms—it is increasingly focused on retrofitting legacy systems, from tanks to fighter jets and naval vessels, with intelligent, software-defined autonomy capabilities.

This retrofit revolution signals a fundamental transformation in how defense systems are conceived and maintained. The shift to a software-defined and hardware-enabled paradigm demands that traditional defense companies evolve beyond mechanical engineering and embrace agile, digital-first approaches. For many, this requires deep collaboration with technology firms that bring the necessary software and AI expertise. The challenge lies in integrating these new capabilities without compromising the reliability, safety, and performance of legacy systems—an area that remains at a critical friction point.

Genewars Looking further ahead, NATO has identified bioengineering as one of the macro-trends shaping the future of defense. Advances in synthetic biology and related technologies entail both bio-engineered novel materials as well as human enhancement technologies. Biosensors for advanced Chemical, Biological, Radiological, and Nuclear (CBRN) defense, genetically engineered alternative food sources, implants for enhanced cognition, and novel medical applications based on biodata and gene editing are just a few areas with obvious defense impact. However, these breakthroughs also introduce complex ethical, regulatory, and dual-use challenges. As bioengineering converges with AI and cyber, it could redefine what it means to secure, project, and protect research and innovation.

Ctrl+Alt+Defend. This complex environment prioritizes collaboration. Ministries of Defense must build new frameworks for working with a diverse ecosystem of actors, including dual-use startups, academic institutions, and private capital. Yet, this collaboration must be carefully balanced against the imperative of maintaining national sovereignty.

The TechnoVision Aerospace and Defense 2025 Team

Project Team:


Caroline Ball


Shivangi Karn


Arjit Vijayvargiya


Abhishek Devdas

Authors:

Patrice Duboé
Lee Annecchino
Frédéric Combes
Bruno Bouf
Benjamin Schulte

Project/ Marketing Manager:

Christine Svitila

Creative and Design:

Anakims Varghese
Arijit Sen
Bidisha Paik
Somnath Sil
Sreemoyee Dutta

Experts in Residence:

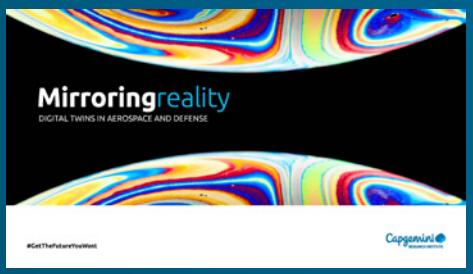
Alexandre Embry
Benjamin Schulte
Caroline Ball
Charles-Alexandre De Taisne
Christopher Gaube
Denis Dallez
Felix Balhorn
Gary James
John Frederiksen
Julie Albert
Lucy Mason
Mark Chang
Martijn van de Ridder
Mike Dwyer
Naimeesh Chauhan
Patrice Duboé
Philip Harker
Pierre-André Vandelle
Ramon Antelo
Ravikanth Pasumarthy
Rene Schlepphorst
Rob Kernahan
Santosh Soni
Sebastien Kahn

Further Research

[Reindustrialization of Europe and US 2025 - Capgemini]

[Future of Batteries Report 2024: Insights on Sustainable Battery Innovation]

[Gen AI in software - Capgemini]

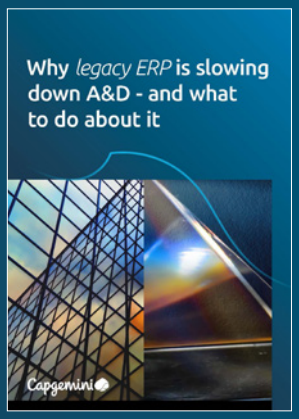


[Digital twins in aerospace and defense - Capgemini]

[Engineering the next for automotive, aerospace and defense - Capgemini]

[Intelligent Supply Chain Management for Aerospace and Defense | Capgemini]

[Digital continuity: The pillar of digital transformation in the aerospace industry]



[Digital core for aerospace and defense manufacturing]

[Sustainable aviation fuel: India's $3 billion SAF opportunity - Capgemini Belgium]

About Capgemini

Capgemini is a global business and technology transformation partner, helping organizations to accelerate their dual transition to a digital and sustainable world, while creating tangible impact for enterprises and society. It is a responsible and diverse group of 340,000 team members in more than 50 countries. With its strong over 55-year heritage, Capgemini is trusted by its clients to unlock the value of technology to address the entire breadth of their business needs. It delivers end-to-end services and solutions leveraging strengths from strategy and design to engineering, all fueled by its market leading capabilities in AI, generative AI, cloud and data, combined with its deep industry expertise and partner ecosystem. The Group reported 2024 global revenues of €22.1 billion.

Get the future you want | www.capgemini.com

Copyright © 2025 Capgemini. All rights reserved.