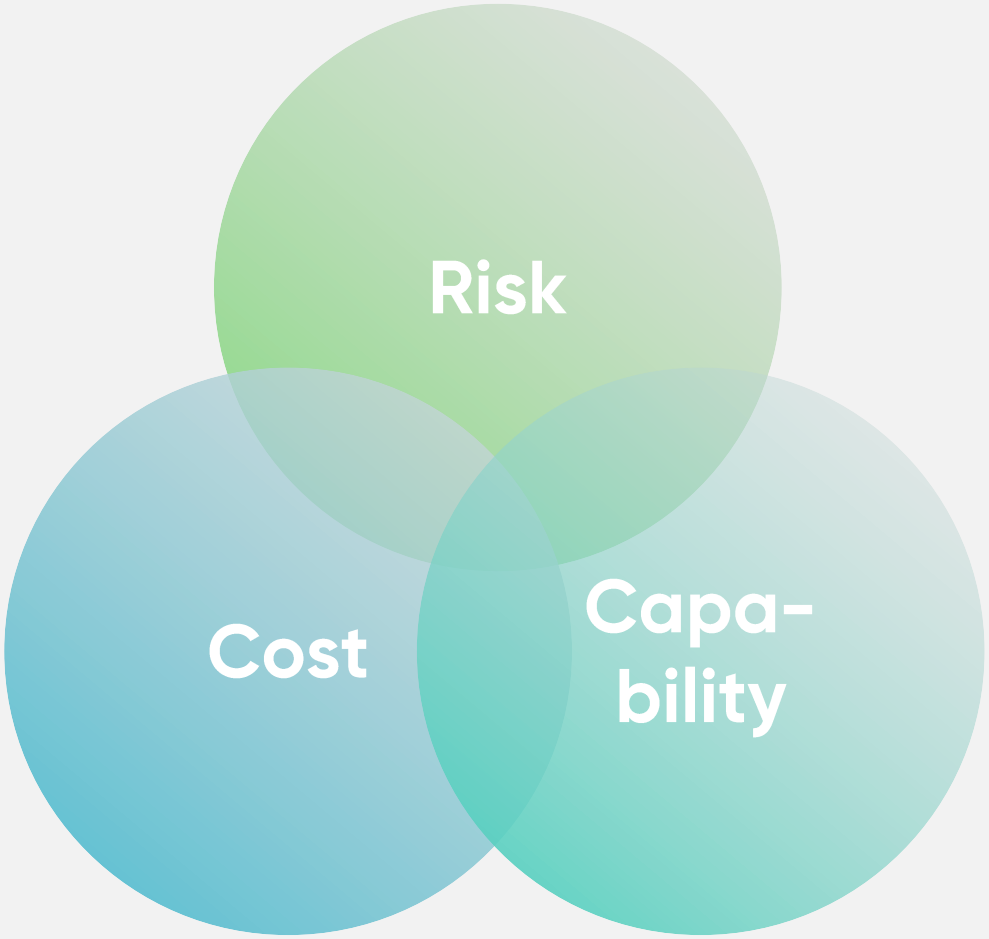
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Organizational Autonomy Action Plan

How companies can manage technological and geopolitical risks while unlocking opportunities to reduce costs, improve performance, and develop new business.

An advisory approach based on ISO/IEC TS 10866:2024.



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December 2026

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cloud ahead, authors and contributors.

1

Political Narrative vs. Economic Reality

The demand for digital sovereignty has become firmly established in mainstream politics. Governments, public authorities, and industry associations pledge to reduce technological dependencies and strengthen European alternatives to regain control over critical digital infrastructure.

Yet private actors are moving in a different direction. Companies continue to invest heavily in global technology platforms. US hyperscalers are growing at record rates, AI is extending their lead, and European companies are increasingly using these technologies to reduce costs and drive innovation.

POLITICAL NARRATIVE	ECONOMIC REALITY
"We must drastically reduce our dependence on individual providers." **Friedrich Merz** German Federal Government, 2026[1]	"The AWS European Sovereign Cloud will help stimulate growth and value creation for Germany." **Dorothee Bär** Federal Research Minister, 2026[4]
"Reduce critical dependencies or ideally avoid them altogether." BMDS, 2026 **BMDS** Official website, 2026[2]	"Only 12% would pay a 10–20% premium for a German cloud." **Bitkom Cloud Report** 2026[5]
"America is no longer a reliable partner." **Bert Hubert** Technology Adviser, February 2025 [3]	"EMEA has become our fastest-growing region." **Anthropic** Company Announcement, 2026[6]

Political calls to reduce technological dependencies coexist with public support for US cloud investments, limited willingness to pay more for alternatives, and record growth among US technology companies.

The gap between political narratives and economic reality remains substantial.

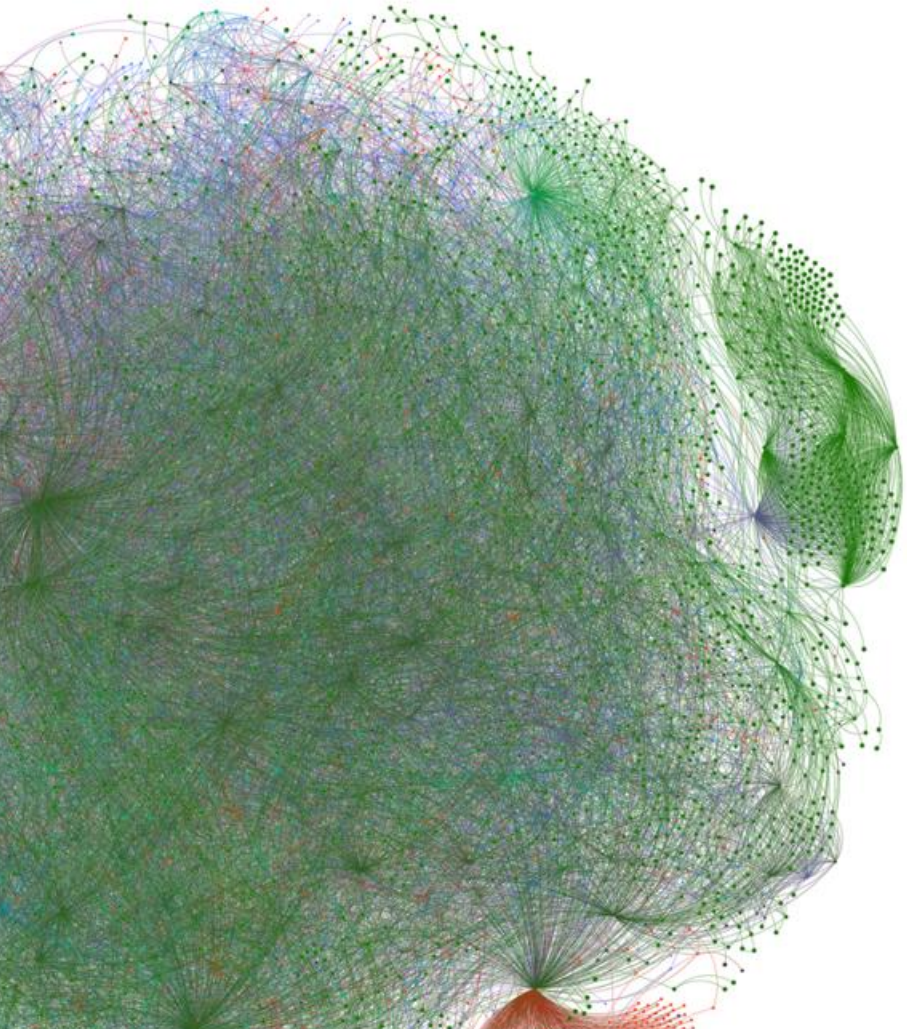
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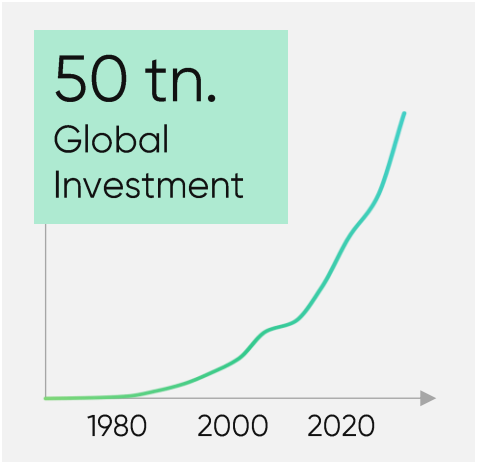
The Nature of the Global Tech Stack

The global tech stack was never designed as a coherent system. It emerged from decades of investment worth trillions of dollars[1] and successive waves of technological innovation.

From mainframes in the 1960s to PCs, the internet, cloud computing, smartphones and AI, each wave expanded technological capabilities without replacing much of what came before.

Companies built on existing technologies, integrating new capabilities through interfaces and APIs rather than migrating systems and processes. The result is a vast, interconnected global software ecosystem spanning generations of technology.





A Glimpse into the Global Supply Mesh

The visualization on the left shows the internal dependency network of a single version of TensorFlow, an open-source AI library containing approximately 4.4 million lines of code[2]. Beyond this, TensorFlow has been copied and modified 78,000 times on GitHub and is used by over 500,000 software projects. [3]

Yet this vast web of dependencies represents only a tiny fraction of the global digital supply mesh. The entire ecosystem is estimated to comprise over 200 million software components, linked by trillions of connections across billions of devices and systems. [4]

While the global tech stack has enabled extraordinary technological progress and economic value, its complexity also creates significant risks. Researchers estimate that every 1,000 lines of code contain between one and four defects. [5]

2

Why Outsourcing Is the Default

The economics of software strongly favor buying external services over developing and operating them in-house. Consider a simple example: a company needs an application to manage customer data. Depending on its approach, the cost of delivering essentially the same business functionality can vary dramatically.

Architecture	Comment	Indicative Cost	Infrastructure
SaaS Fremium	Fully Outsourced	**€0** per month[1]	Included
Serverless	AWS	**$0.00000854** per request[2]	Included
Cloud Standard Mgd. Kubernetes	Scaleway	**€80** per month[3]	Additional
Service Provider Mgd. Kubernetes	Giant Swarm	**~€180,000** per year[4]	Additional
Self-managed Kubernetes	Fully Insourced	**~€480,000** per year[5]	Additional

These approaches differ substantially in their technical architecture, functionality, operational responsibilities, control and risk profiles. Yet from the perspective of the business capability they deliver—managing customer data—the cheapest option may actually offer the best user experience and the richest functionality. Two fundamental characteristics of software explain this: scalability and ease of integration:

- Software can serve millions of customers at low marginal cost, allowing specialized providers to spread development and operating costs across a large customer base.
- Standardized interfaces and APIs make it possible to integrate these capabilities without building everything from scratch.

The result is a powerful economic incentive to outsource. For many business functions, external software delivers more capability at lower cost and with less implementation effort. While this increases certain risks, such as vendor lock-in, it can also reduce others, particularly cybersecurity and operational risks, thanks to the specialization and scale of external providers.

3

Driving Organizational Autonomy with ISO 10866

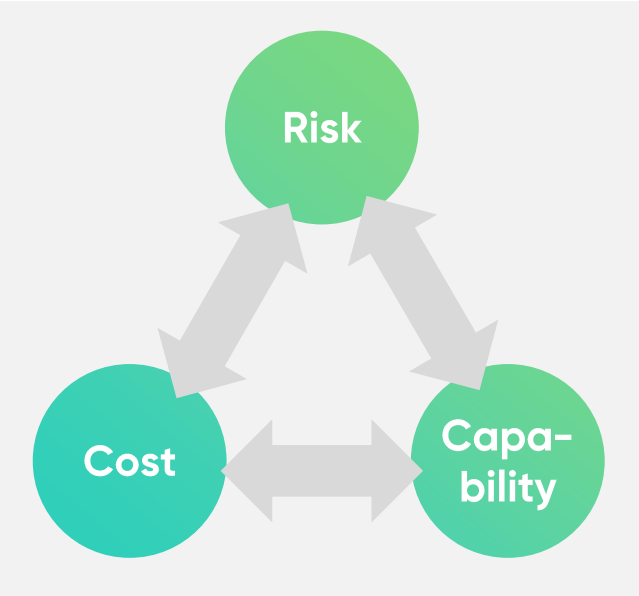
The global tech stack offers enormous economic and technological advantages, but also creates dependencies and risks. Avoiding these dependencies altogether would mean sacrificing much of the value they provide. The challenge is therefore not to maximize independence, but to manage dependencies in ways that serve the organization's business objectives.

Digital Sovereignty as an Optimization Challenge

Every technology decision involves trade-offs between three dimensions:

- Risk: Cyber Vulnerability, Operational Disruption, Loss of Expertise, Regulatory Exposure, Kill Switch, Vendor Lock-in.
- Cost: Investments, Marginal Costs, Operating Costs, Switching Costs, Opportunity Costs.
- Capability: Functionality, Performance, Integration, Scalability, Access to Latest Technologies.

These dimensions are interconnected. Moving away from a global cloud provider will reduce geopolitical exposure, but may increase costs, implementation risks or operational complexity. Conversely, adopting external platforms may improve capabilities and costs while creating new exposures.



From Digital Sovereignty to Organizational Autonomy

ISO/IEC TS 10866:2024 distinguishes digital sovereignty, primarily associated with governmental requirements, from organizational autonomy: the independence and freedom of action organizations need to achieve their objectives. [1]

Building on this distinction, cloud ahead approaches sovereignty as an optimization challenge. The objective is not maximum independence, but the right balance of risk, cost and capability to fulfill the organization's mission.

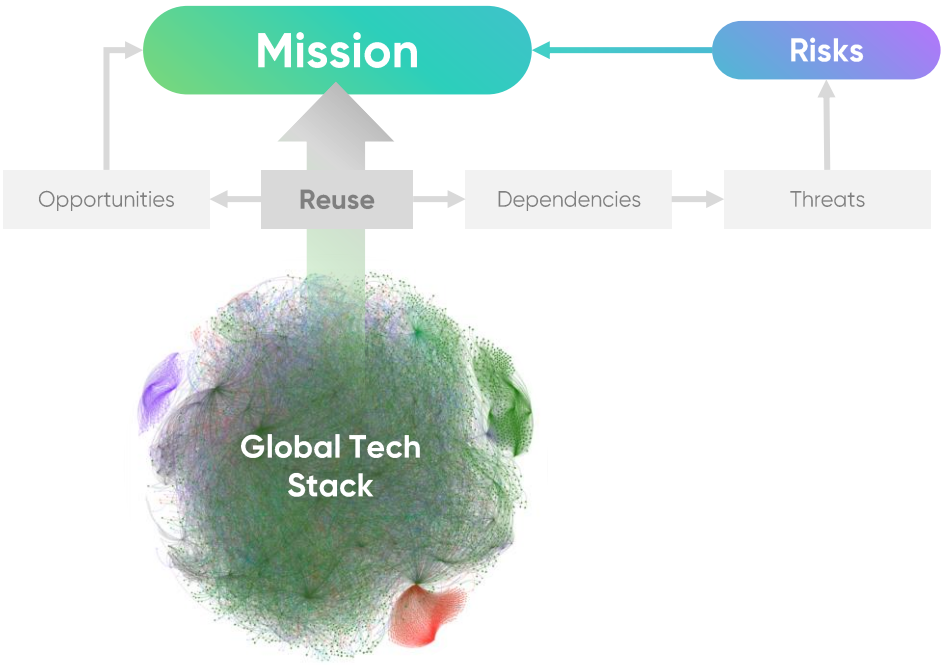
3 - Driving Autonomy with ISO10866

The Mission Determines What Matters

Technological dependencies are not inherently problematic. They become relevant when a threat can exploit them in ways that jeopardize the organization's mission.

The same dependency may be critical for one organization and largely irrelevant for another. A temporary cloud outage, for example, has very different consequences for an online payment provider than for a company using the cloud as one of many internal video conferencing tools.

This makes the organization's mission the starting point of any meaningful sovereignty assessment. Rather than asking which technologies are foreign, proprietary or replaceable, the central questions become: Which business capabilities must be preserved? Under which scenarios could they be compromised? And what consequences would that have?



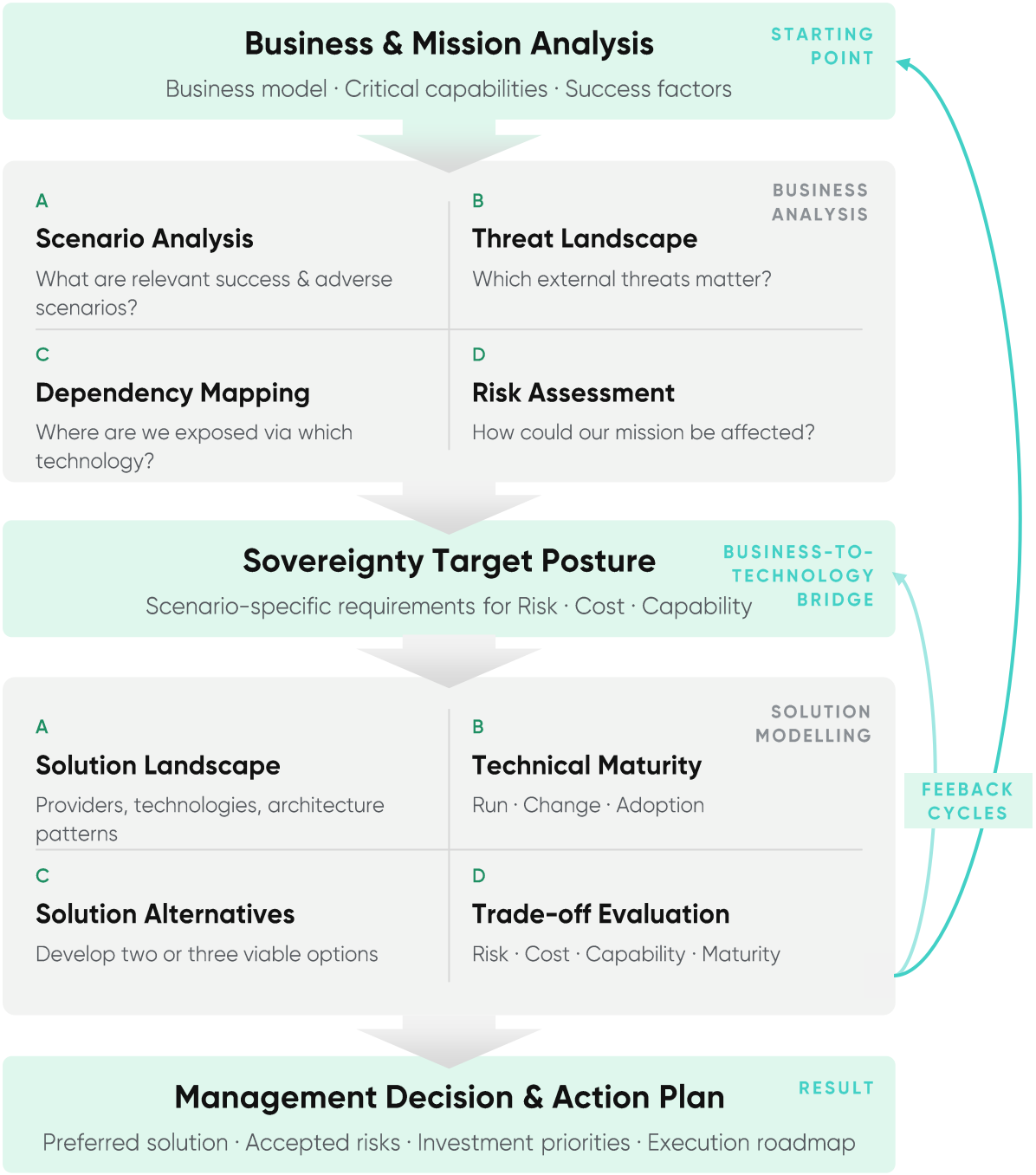
This perspective shifts the focus from technological independence to organizational autonomy: the ability to fulfill the mission under changing technological, economic and geopolitical conditions.

The Organizational Autonomy Approach

Cloud ahead builds on ISO/IEC TS 10866:2024 to translate this mission-centered perspective into practical decisions. Identifying threats and dependencies is only the first step. The real challenge is to develop solutions that manage these risks while improving costs and capabilities.

3 - Driving Autonomy with ISO10866

The Organizational Autonomy Approach addresses this challenge through an iterative process: from business objectives, positive and adverse scenarios over risk assessment to technological alternatives, trade-off evaluation and an actionable management decision.



The assessment is not a linear process. It iteratively reconciles business requirements and technological options to find the smartest balance between risks, costs and capabilities. The goal is to manage the uncertainties of today's global tech stack while unlocking its potential to reduce costs, strengthen competitiveness and create new business opportunities.

4

Autonomy in Practice

ISO/IEC TS 10866:2024 was developed through an international standardization process involving national standards bodies and industry experts. Organizations active in the relevant standardization work include Fraunhofer, the International Data Spaces Association (IDSA) and Microsoft. Approved through the ISO/IEC process and published in November 2024, the Technical Specification is now being developed into a full International Standard.

While documented applications of ISO 10866 are not yet public, existing use cases already demonstrate how organizations can strengthen autonomy while reducing costs, managing risks and improving capabilities.

CASE 1

37 SIGNALS

Reducing Risk and Cost at the Same Time

37signals operates established software products, Basecamp and HEY, with stable, predictable workloads and limited need for rapid scaling. Facing high AWS costs and growing provider dependency, the company saw an opportunity to improve both economics and autonomy. [1]

Action: 37signals migrated major workloads to owned servers in two data centers, using open-source technologies and existing engineering staff to operate the infrastructure.

Outcome: Annual cloud cost fell from $3.2 million to $1.3 million, reducing provider dependency and saving approximately $1.9 million in annual cloud spending.

Catch: Founder David Heinemeier Hansson is a tech guru, and over 30% of 37signals' workforce are engineers. Few companies can match that expertise.

CASE 2

EUROPEAN CENTRAL BANK

Leveraging US Technology Without Vendor Lock-in

Faced with growing demands to analyze vast amounts of financial and economic data, the ECB adopted a hybrid multi-cloud strategy combining AWS, Google Cloud and on-premises infrastructure, while preserving its ability to leave individual providers. [2]

- **How it works:** Portable architectures, data portability, in-house expertise and tested migration procedures make switching providers operationally feasible.
- **Outcome:** Access to advanced US cloud technologies without surrendering the ability to switch providers, strengthening the ECB's negotiating position.
- **Catch:** Maintaining this exit capability requires substantial engineering and architectural expertise, operational discipline and ongoing investment.

CASE 3

UNIVERSITY HOSPITAL SCHLESWIG-HOLSTEIN (UKSH)

Modernizing IT While Reducing CLOUD Act Exposure

UKSH aims to improve patient care, reduce administrative workloads and introduce AI-assisted diagnostics, including MRI analysis and tumor detection. Handling highly sensitive patient data, however, creates strict security and data protection requirements. [3]

How it works: UKSH uses the T-Systems Sovereign Cloud based on Google Technology. T-Systems manages operations and holds encryption keys in German data centers, outside Google's infrastructure.

Outcome: Access to Google Cloud's advanced technologies while reducing the risk of unauthorized access to sensitive patient data.

Catch: Not all Google Cloud services are covered by T-Systems' sovereignty controls.

CASE 4

TREMBITA UKRAINE

Extreme Autonomy Through Smart Software Architecture

Facing cyberattacks, destroyed data centers and disrupted networks, Ukraine cannot rely on infrastructure remaining available. Hence, it achieved resilience of its Trembita platform via software architecture, enabling essential government services to continue despite disruptions. [4]

- **How it works:** Based on Estonia's X-Road, Trembita connects distributed government registries through decentralized security gateways. Data exchange does not depend on a central transaction hub.
- **Outcome:** More than 220 connected information systems and 27 billion transactions, supporting digital public services even under wartime conditions.
- **Catch:** Resilience at the software level requires architectural changes, involving redesigns of existing applications and integrations.

CASE 5

BUNDES-AGENTUR FÜR ARBEIT

Access to Modern Workplace Via Local Partners

The German Federal Employment Agency is piloting Delos Cloud to access Microsoft 365 and Teams while mitigating geopolitical and regulatory risks. Rather than replacing Microsoft technology, it relies on a German operating and data trusteeship model through SAP subsidiary Delos Cloud. [5]

- **How it works:** Microsoft supplies the technology, while Delos operates the infrastructure in German data centers, independently controlling operations, data access and updates.
- **Outcome:** The model reduces exposure to US CLOUD Act access requests and unilateral service shutdowns (kill switches), while retaining Microsoft's productivity capabilities.
- **Catch:** Microsoft technology remains in the supply chain.

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From Assessment to Action

Turning Sovereignty Dilemmas into Business Opportunities

Reducing technological dependencies often increases costs, limits capabilities or creates new risks. But these trade-offs are not inevitable.

By combining business strategy, risk management and technological expertise, cloud ahead identifies innovative ways to mitigate risks while simultaneously reducing costs, improving performance and unlocking new business potential.

Four Ways to Value

From focused management workshops to continuous RiskOps, our engagements translate sovereignty challenges into actionable decisions and measurable business value.

Offering	Scope	Value	Typical Engagment
Organizational Autonomy Workshop	Focused management workshop exploring mission, threats and dependencies	Identify quick wins and avoid unnecessary investments	1 day 5.000 €
Organizational Autonomy Action Plan	Analyze business mission, scenarios, dependencies and risks; evaluate strategic alternatives	Prioritize investments that improve risk, cost and capability	4-6 weeks ~15-30.000 €
Application Environment Action Plan	Deep dive into architecture, operations and suppliers; evaluate mitigation options against risk, cost and capability	Design implementation-ready solutions with a clear business case	6-10 weeks starting from 30.000 €
RiskOps Management & Governance	Integrate sovereignty risks into architecture, procurement, investment and governance decisions	Continuously manage risks, optimize costs and capture opportunities	2-4 months starting from 30.000 €

Let's find your next opportunity.

Start with an Organizational Autonomy Workshop to identify where smarter risk management can unlock tangible business value.

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About

cloud ahead

cloud ahead is a European research and advisory firm focused on making digital sovereignty economically and technologically viable.

We help organizations manage the risks of the global technology stack without sacrificing its benefits. Combining strategic risk management with business and technology expertise, we develop innovative solutions that strengthen organizational autonomy while reducing costs, improving capabilities and creating new business opportunities.

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