

The erosion of geopolitical stability - exemplified by territorial claims against an EU member state - underscores the urgent need for resilience in contemporary statecraft. Particularly concerning is the fragility of digital infrastructure across EU member states, a vulnerability starkly exposed by last year's CrowdStrike incident. Erroneous automated software updates disrupted critical infrastructure and air travel, illustrating how an ostensibly inadvertent technological failure could, in times of geopolitical tension or conflict, be deliberately weaponised to paralyse essential industries and services.

This reality demands a rigorous reassessment of Europe's systemic software dependencies, particularly in cloud computing, alongside a concerted effort to strengthen alternative technologies.

Open source software emerges as a cornerstone of this strategy. By fostering innovation, reducing reliance on proprietary systems, and enabling cross-border collaboration, open source solutions have the potential to fortify European resilience. Crucially, they empower local developers and enterprises to tailor software to regional needs, enhancing flexibility, cutting costs, and accelerating responses to crises - whether economic, environmental, or geopolitical.

Moreover, open source frameworks mitigate vulnerabilities stemming from external control. Proprietary systems often create structural dependencies on a single vendor, leaving critical infrastructures - such as healthcare and transport - subject to the strategic, commercial, and regulatory decisions of entities beyond European jurisdiction. By contrast, open source architectures enable Europe to develop and maintain an autonomous technological foundation, an imperative in an era of increasingly fragile supply chains and shifting global alliances.

The European Union, comprising 27 states with distinct but complementary strengths, is uniquely positioned to leverage open source collaboration. German precision engineering, French leadership in artificial intelligence, and Estonian expertise in e-governance exemplify the synergies that could drive the development of robust, indigenous technological solutions. Commercial offerings such as the open source Nextcloud platform illustrate the scalability of this model. Furthermore, the COVID-19 pandemic underscored the effectiveness of open-source innovation, as seen in the rapid deployment of freely adaptable ventilator designs and contact-tracing applications. Video collaboration platforms were essential in sustaining commercial activity during the pandemic, yet Europe's reliance on third-country providers warrants urgent scrutiny.

However, open source development is no panacea. Market adoption can be slow, and without sustained funding and strategic coordination, efforts risk fragmentation. Recognising these challenges, European stakeholders have advocated for the institutionalisation of digital autonomy through initiatives such as *Eurostack*, designed to consolidate European technological sovereignty.

Ultimately, strategic investment in open source ecosystems could make Europe more self-reliant, agile, and innovative - transforming its technological landscape from one of dependency to one of leadership. The goal is not merely to replicate existing models but to establish ownership over the fundamental frameworks that will define the future of global digital infrastructure.