

Digital identity in Europe: opportunities and challenges

In September 2025, UK Prime Minister Keir Starmer formally confirmed plans for a national digital identity scheme, set to be implemented by 2029. This initiative presents significant opportunities for European technological expertise as increased adoption of such schemes could strengthen Europe's position in biometrics, identity management and cyber security, not only in terms of domestic deployment but also as a leading exporter of such technologies.

- Europe has established itself as a leader in digital-identity implementation and is home to a thriving start-up ecosystem in this field. Alongside major industry players, more than 2,500 digital ID start-ups operate across the continent. Over the past five years, these companies have collectively raised US\$1.53 billion in funding.
- The UK's entry into this domain is expected to generate significant opportunities for the industry, potentially creating digital-infrastructure contracts worth at least US\$188 million, with some estimates suggesting the total could reach billions.
- The European Union is advancing a decentralised 'digital wallet' framework that emphasises data minimisation, interoperability and privacy-first design, presenting both a challenge and an opportunity for technology companies.

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41%

ESTIMATED PERCENTAGE OF PEOPLE WORLDWIDE WHO HAVE A DIGITAL ID

EUR20 MILLION

ESTIMATED COST OF ESTABLISHING THE EU DIGITAL IDENTITY WALLET INFRASTRUCTURE

83 MILLION

PROJECTED NUMBER OF EU DIGITAL IDENTITY WALLET IN CIRCULATION BY THE END OF 2025

The promise of digital ID

Since Finland introduced the first electronic identity card in 1999, digital ID systems have played a crucial role in service provision and public security in more than 130 countries. According to the United Nations, by 2024, 78% of member states had enacted legislation or issued policy documents on using digital identity schemes to enable access to public services.

Although the introduction of digital ID systems holds significant promise, their implementation remains a formidable task. At the heart of the challenge is the personal data of millions of individuals, which underpins every national ID system. Europe has developed some of the most advanced systems in this field. Estonia stands out as a pioneer: its e-Estonia platform, launched in 2002, uses data-exchange technology that other countries have since adopted. Other European countries such as Belgium were among the first adopters of chip-based national ID cards in the early 2000s.

“In today’s interconnected world, the use of digital wallets is a pivotal step towards a seamless and secure identification in both the physical and digital world.”

➤ Juhan Lepasaar, Director, EU Agency for Cybersecurity Executive, September 2024

“This is a unique opportunity to take us all further into experiencing what it means to live in Europe, and to be European.”

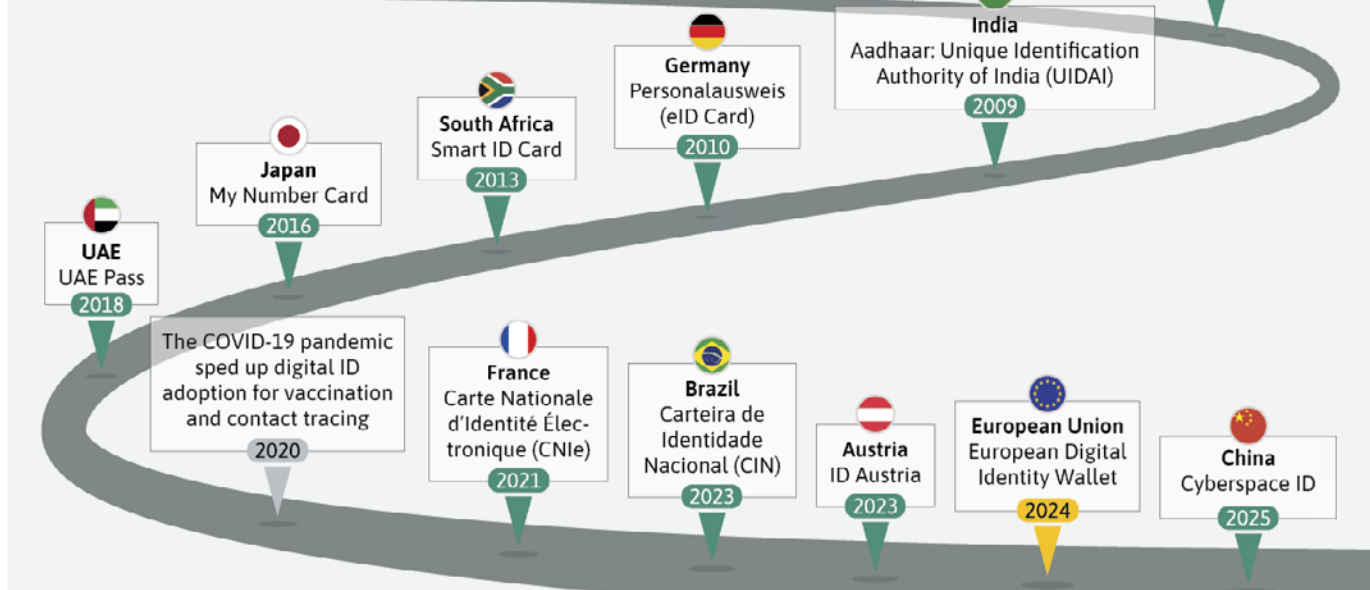
➤ Margrethe Vestager, Executive Vice-President for a Europe Fit for the Digital Age (2019–24), European Commission, June 2021

“Our European companies, large and small, will also benefit from this digital identity, they will be able to offer a wide range of new services since the proposal offers a solution for secure and trusted identification services.”

➤ Thierry Breton, Commissioner for Internal Market, European Commission, June 2021

Building on this experience, Europe has developed a substantial industrial base in digital identification. In May 2025, UK government researchers identified 266 firms operating in the UK that provide digital identity services, generating around US\$2.8bn in revenue in the preceding tax year. Meanwhile, the global market size was US\$16.61bn in 2024, projected to reach over US\$65bn by 2033.

Selected government-issued digital ID programmes



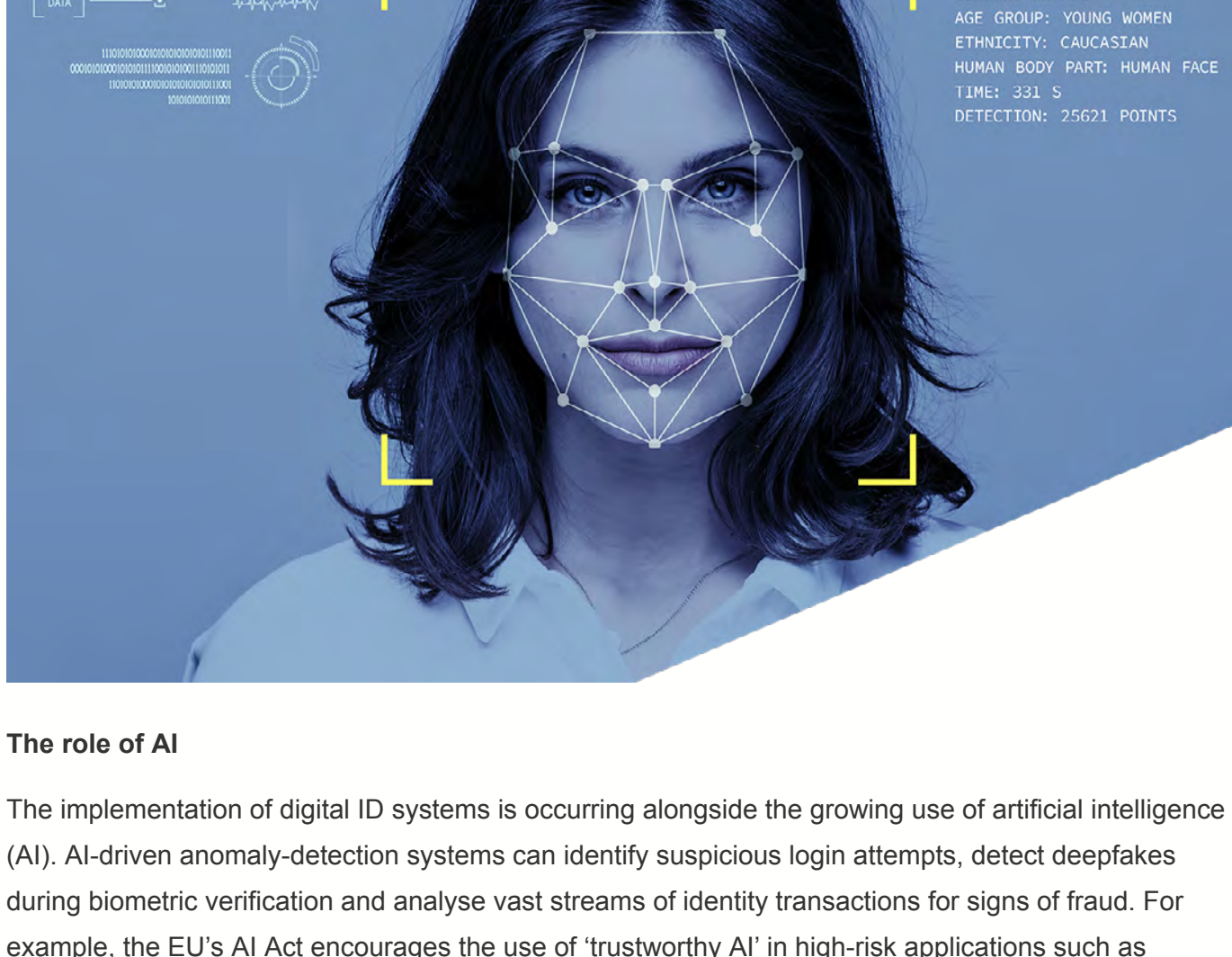
Cyber-security challenges

The expansion of digital ID will drive further growth in Europe's cyber-security industry – estimated to be worth US\$57bn in 2024 – which will be increasingly essential to securing and sustaining these systems. National digital ID programmes have repeatedly suffered from security breaches in recent years, exposing personal data and highlighting the need for strong cyber security. In some cases, personal data was sold illegally, either as a stand-alone product or as services that grant criminals paid access. Even countries with robust cyber-security frameworks, such as Singapore, have not been immune to a sharp rise in illicit activity involving Singaporean identity data in the first half of 2024.

To address these challenges, European governments are starting to rely more on decentralisation and blockchain technology. This method allows citizens' data to be stored in a distributed manner rather than in centralised databases that have become major targets for cyber attacks. For example, the EU is developing a Digital Identity Wallet that focuses on data sovereignty and privacy, with the aim of creating opportunities for European businesses and increasing transparency and trust among the public.

While decentralised ID systems offer a degree of protection, they are not without shortcomings. These systems are typically more complex and expensive to implement, which can hinder their adoption in developing countries, which are home to the majority of the 3.3bn people worldwide who currently lack access to any form of government-issued digital ID.

Another challenge is the dispersal of citizens' data across various public and private entities, which increases the number of potential access points. This widespread sharing creates fragmented and difficult-to-manage ecosystems, in which identity data is routinely exchanged between government bodies and private organisations for use in a range of services. As a result, sensitive identity information is increasingly held by third parties whose security standards may not always be sufficiently robust to protect the data.



The role of AI

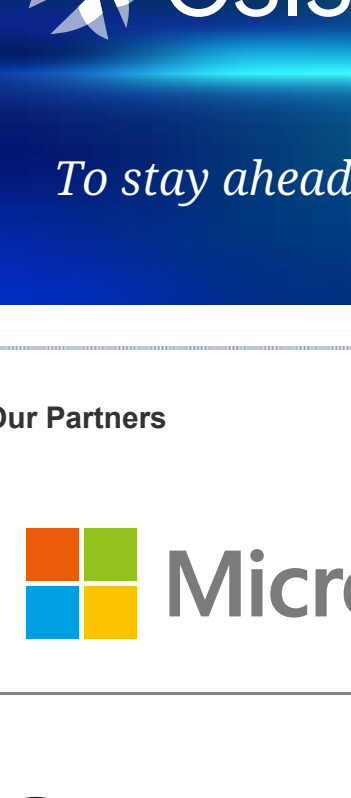
The implementation of digital ID systems is occurring alongside the growing use of artificial intelligence (AI). AI-driven anomaly-detection systems can identify suspicious login attempts, detect deepfakes during biometric verification and analyse vast streams of identity transactions for signs of fraud. For example, the EU's AI Act encourages the use of 'trustworthy AI' in high-risk applications such as identity verification, requiring continuous monitoring of algorithmic decision-making to ensure transparency and accountability.

However, the same technologies also expand the attack surface. Adversaries can use generative AI to fabricate synthetic identities that bypass verification checks or reconstruct biometric traits from leaked datasets. As European national ID systems increasingly incorporate biometrics (or integrate with border, social-services or e-government platforms), the urgency of securing digital ID infrastructure increases.

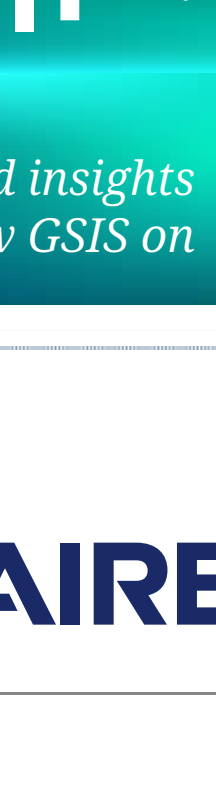
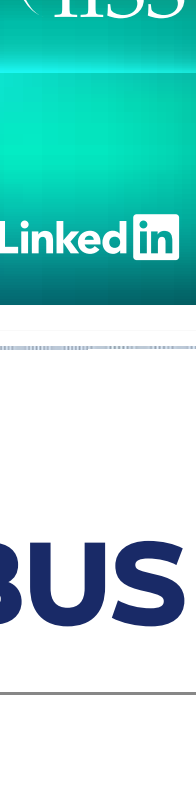


The road ahead

The expansion of digital identity schemes in Europe represents far more than a technical upgrade to government services. It is a strategic transformation that will shape economic competitiveness, democratic trust and digital sovereignty for decades to come. To harness these benefits, European policymakers must view digital ID not as a stand-alone system but as part of a broader security and innovation ecosystem that includes cyber resilience, AI governance and cross-border inter-operability. If Europe can achieve this balance, it will not only safeguard the identities of its citizens but also position itself as a global leader in exporting secure, privacy-preserving identity technologies, setting the standard for how digital trust is built and protected in the AI era.

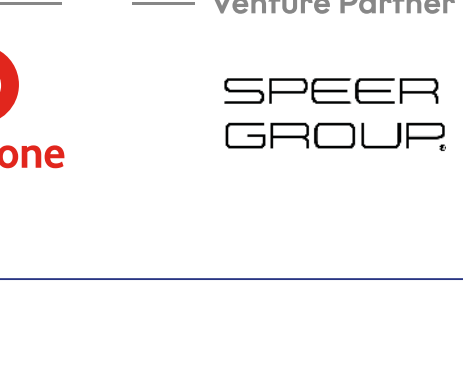


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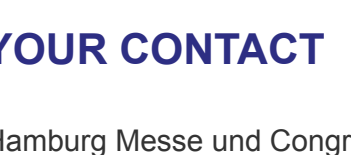
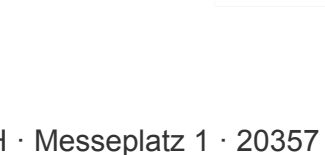
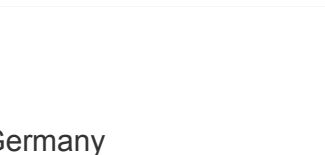



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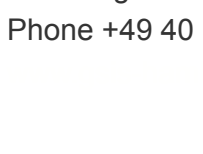
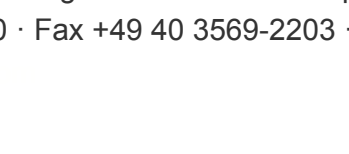
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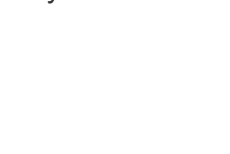



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