Europe 3.0

A Web 3.0 Strategy for Accelerating Europe's Digital Economy

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Europe 3.0 - A Web 3.0 Strategy for Accelerating Europe's Digital Economy

In an era defined by rapid technological evolution, Europe stands at a pivotal moment to redefine its role in the global digital economy.

The rise of Web 3.0—characterized by decentralized technologies, user empowerment, and trustless systems—presents an unprecedented opportunity to accelerate innovation, foster inclusivity, and strengthen economic resilience across the continent.

Europe 3.0: A Web 3.0 Strategy for Accelerating Europe's Digital Economy explores how the European Union can harness the transformative potential of decentralized identity systems, blockchain, and interoperable frameworks.

Blockchain and Digital Wallets: Analysis of the EU's pioneering efforts to integrate Verifiable Credentials, decentralized identifiers, the EUDI Wallet and the European Blockchain Services Infrastructure to build a future-ready digital ecosystem.

Artificial Intelligence: The EU aims to make Europe a global AI hub by leveraging talent and industries, with a €200 billion InvestAI initiative to boost economic growth and competitiveness in sectors like healthcare, education, and industry.

By prioritizing user control, security, and cross-border interoperability, Europe is not only streamlining its internal digital infrastructure but also setting global standards for data sharing and trust.

From revolutionizing education and healthcare to empowering financial inclusion and sustainable trade, this vision of Europe 3.0 outlines a bold strategy to leverage Web 3.0 principles, ensuring the EU leads the charge in shaping a decentralized, equitable, and prosperous digital future.

Blockchain as the Platform for Europe 3.0

Europe stands at a pivotal moment in its technological and economic evolution.

As the continent navigates the complexities of a digital-first world, blockchain technology emerges as a transformative force capable of redefining its future.

Dubbed "Europe 3.0," this vision leverages blockchain to create a decentralized, transparent, and inclusive digital ecosystem that empowers citizens, businesses, and governments.

By harnessing blockchain's potential, Europe can lead the charge toward a new era of innovation, trust, and sovereignty in the global digital economy.

The Foundation of Europe 3.0

The concept of Europe 3.0 builds on the legacy of Europe 1.0 (post-World War II integration) and Europe 2.0 (the digital and single-market advancements of the late 20th and early 21st centuries).

Europe 3.0 envisions a decentralized, citizen-centric framework where blockchain serves as the backbone for secure, transparent, and efficient systems across sectors. At its core, blockchain—a distributed ledger technology—ensures trust without intermediaries, immutability of records, and seamless cross-border collaboration. These qualities align perfectly with Europe's values of unity, transparency, and innovation.

Blockchain as the Platform for Europe 3.0

Blockchain's transformative power lies in its ability to address longstanding challenges: bureaucratic inefficiencies, data silos, and trust deficits. For Europe, a region with 27 member states, diverse economies, and complex regulatory frameworks, blockchain offers a unifying platform to streamline processes, enhance interoperability, and empower individuals.

Key Pillars of Blockchain-Driven Europe 3.0

Digital Identity and Citizen Empowerment

A cornerstone of Europe 3.0 is self-sovereign identity (SSI), enabled by blockchain. SSI allows individuals to control their personal data, sharing only what is necessary for specific transactions. Imagine a European citizen accessing healthcare, voting, or financial services across borders with a single, secure digital ID.

Blockchain-based SSI systems, like those being explored in the European Blockchain Services Infrastructure (EBSI), ensure privacy, reduce fraud, and eliminate the need for redundant verifications. By 2030, EBSI aims to enable cross-border services such as academic credential verification and professional qualifications, fostering a truly integrated digital single market.

Decentralized Governance and Transparency

Blockchain can revolutionize governance by making public processes more transparent and accountable. Smart contracts—self-executing agreements coded on the blockchain—can automate public procurement, ensuring fairness and reducing corruption. For instance, Estonia, a pioneer in e-governance, has integrated blockchain to secure health records and e-voting systems. Scaling such initiatives across Europe could enhance trust in institutions, streamline bureaucracy, and enable participatory democracy through secure, transparent voting mechanisms.

Economic Innovation and Financial Inclusion

Blockchain is redefining finance through decentralized finance (DeFi) and tokenized assets. Europe 3.0 can leverage these tools to democratize access to capital, especially for small and medium-sized enterprises (SMEs), which form the backbone of the EU economy. By tokenizing assets like real estate or intellectual property, blockchain enables fractional ownership, unlocking liquidity and investment opportunities.

Moreover, central bank digital currencies (CBDCs), such as the digital euro under exploration by the European Central Bank, could enhance monetary sovereignty while ensuring financial inclusion for unbanked populations.

Sustainable Supply Chains and Circular Economy

Europe's commitment to sustainability aligns seamlessly with blockchain's ability to ensure transparency in supply chains. From tracing the origin of agricultural products to verifying the ethical sourcing of raw materials, blockchain can provide immutable records that build consumer trust and support the EU's Green Deal objectives. For example, blockchain-based platforms like IBM's Food Trust are already enabling traceability in food supply chains. In Europe 3.0, such systems could scale to create a fully transparent, circular economy, reducing waste and promoting sustainable practices.

Interoperability and Cross-Border Collaboration

Europe's diversity is its strength, but it also poses challenges for interoperability. Blockchain's decentralized nature allows for standardized, secure data exchange across borders without compromising national sovereignty. The EU's Alastria network, a permissioned blockchain, demonstrates how public-private collaboration can create scalable solutions for cross-border trade, logistics, and data sharing. By fostering interoperability, blockchain can reduce friction in the single market, boosting economic efficiency.

Challenges and the Path Forward

While the potential of blockchain for Europe 3.0 is immense, challenges remain. Scalability, energy consumption, and regulatory harmonization are critical hurdles. Public blockchains like Ethereum have faced criticism for high energy use, though innovations like Ethereum's transition to proof-of-stake and layer-2 solutions are addressing these concerns. Europe must invest in energy-efficient blockchain protocols and foster collaboration between regulators, technologists, and industry leaders to create a cohesive framework.

Regulatory clarity is paramount. The EU's Markets in Crypto-Assets (MiCA) regulation, set to be fully implemented by late 2024, provides a robust framework for crypto-assets, but ongoing dialogue is needed to balance innovation with consumer protection. Additionally, public education and digital literacy campaigns are essential to ensure citizens embrace blockchain-based systems without fear of complexity or privacy risks.

A Call to Action for Europe 3.0

Europe has a unique opportunity to lead the global blockchain revolution. By investing in research, fostering public-private partnerships, and prioritizing citizen-centric solutions, the EU can build a digital ecosystem that reflects its values of inclusivity, transparency, and sustainability. Initiatives like the European Blockchain Partnership and Horizon Europe's funding for blockchain research are steps in the right direction, but bolder action is needed.

To realize Europe 3.0, stakeholders must:

- Accelerate adoption of blockchain in public services, starting with pilot projects in identity, healthcare, and education.
- Foster innovation hubs to support blockchain startups and SMEs, ensuring Europe remains competitive with global leaders like the U.S. and China.
- Promote digital literacy to empower citizens to engage with blockchain technologies confidently.
- Collaborate globally to set international standards for blockchain interoperability and ethics, reinforcing Europe's role as a global tech leader.

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The Vision of Europe 3.0

Imagine a Europe where citizens seamlessly access services across borders with a single digital ID, where businesses thrive in a transparent, frictionless single market, and where governments operate with unparalleled efficiency and trust. Blockchain is not just a technology—it's the foundation for a reimagined Europe that embraces innovation while staying true to its values.

Europe 3.0 is within reach. By embracing blockchain as the platform for this new era, Europe can redefine its future, empower its citizens, and lead the world toward a decentralized, equitable digital age. The time to act is now—let's build the future together.

Innovation Projects and Pioneers

Below is a list of the main innovation projects, research programs, and pioneers relevant to the objective of leveraging blockchain as the platform for Europe 3.0.

Blockchain as the Platform for Europe 3.0

- European Blockchain Services Infrastructure **(EBSI)**: EBSI is the EU's flagship blockchain initiative, launched in 2018 by the European Blockchain Partnership (EBP), comprising all 27 EU member states, Norway, Liechtenstein, and the European Commission. It aims to deliver cross-border public services using blockchain, focusing on trust, security, and interoperability.
- European Blockchain Partnership – Formed in 2018 by 29 countries and the European Commission, the EBP drives EBSI's development and promotes blockchain-based public services. It coordinates cross-border collaboration and use case development.
- European Blockchain Sandbox: Launched by the European Commission in 2023, this regulatory sandbox hosts 20 blockchain projects annually until 2026, providing legal and regulatory guidance to foster innovation. It supports startups and public entities in testing blockchain solutions in a safe environment.
- Alastria Network: Alastria is a Spain-based, permissioned blockchain consortium founded in 2017, involving over 500 members, including businesses, public administrations, and universities. It uses a Quorum-based Ethereum implementation to support use cases like digital identity, supply chain, and financial services.
- British Blockchain Association: The BBA have led the development of the UK's Blockchain Roadmap, seeking to position the UK as a Blockchain and Crypto Centre of Excellence, defining a 6-Point Action Plan to turbocharge the UK's Web 3.0 economy.
- Scottish Enterprise / Napier University: In Scotland academics and business leaders have launched a Scottish 'centre of excellence for digital trust and distributed ledger technology' – to support online safety in key sectors including finance and healthcare.

Data Without Borders: The Role of the EU Digital Wallet in Europe 3.0

The European Union (EU) is set to launch a digital identity wallet as part of its efforts to enhance digital services and improve security for its citizens.

The EU writes that a personal digital wallet for EU citizens will make it easier for people to access public services and make online transactions.

They provide this short intro, highlighting the benefits for SMEs through more secure and streamlined online commerce functions.

Digital wallets empower users to manage and share data securely, while blockchain provides the decentralized, transparent infrastructure to ensure trust and verifiability. Together, they align with the EU's vision for ethical, interoperable, and privacy-focused data governance, offering a scalable model for global cross-border data sharing. By integrating these technologies, the EU is not only streamlining its internal digital ecosystem but also setting a benchmark for global standards that prioritize user trust and systemic resilience.

Digital wallets and blockchain technology play distinct yet complementary roles in enabling secure, efficient, and decentralized data management, transactions, and identity verification, with significant implications for cross-border data sharing. Below, I outline their roles and how they intersect, particularly in the context of the EU's digital standards and global best practices.

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Far from being a regional phenomenon, the EU's approach presents a transformative opportunity to establish universal best practices for cross-border data sharing.

The EU's digital standards, such as eIDAS and EBSI, leverage blockchain and digital wallets to create a trusted ecosystem for cross-border data sharing. These frameworks set a precedent for global best practices by prioritizing privacy, security, and interoperability. For instance, blockchain-based digital wallets could standardize how health data is shared globally, ensuring compliance with varying regulations while maintaining user control.

Together, digital wallets and blockchain enable secure, user-controlled, and interoperable data sharing across borders. For example, a blockchain can record a verified identity issued in one country, while a digital wallet allows the user to present it in another, with both systems ensuring compliance with EU standards.

eIDAS

The proposed new framework amends the 2014 regulation on electronic identification and trust services for electronic transactions in the internal market (eIDAS regulation), which laid the foundations for safely accessing public services and carrying out transactions online and across borders in the EU.

A digital identity wallet offers numerous benefits for both individuals and service providers, including users managing their digital identity from a single platform, and security: The wallet employs advanced encryption and authentication mechanisms, reducing the risk of identity theft and fraud. Users have control over their personal data and can choose what information to share with service providers.

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The EUDI wallet will revolutionise how citizens and businesses can digitally identify themselves when accessing public and private services throughout Europe, using their smartphone in a secure and convenient manner. It will allow citizens to control their personal data stored within the wallet. The wallet will also be equipped with mechanisms to minimise the data shared for accessing services.

The EUDI wallet will make easier for EU citizens to travel and move to a new country. It will include digital travel credentials, and will simplify the processes of opening a bank account, registering for a SIM card, proving educational and professional qualifications, and claiming social benefits through the European Health Insurance Card.

Identity-Enabled Digital Ecosystem

What is notable about this is not so much the digital identity technologies, which are of course important, but rather how it also defines a model for a partner ecosystem.

This initiative aims to provide individuals with a secure and convenient way to prove their identity online, while also creating new market opportunities for vendors and entrepreneurs. The digital identity wallet will be compatible with various online services, enabling seamless integration across different platforms.

The technical documentation is published here, which highlights that rather than this initiative being about a single, standalone technology, it defines an overall inter-operating digital ecosystem, featuring:

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- **End Users of EUDI Wallets –** End users are defined as natural or legal persons that will be using the wallets to send, receive, store and share attestations and personal attributes about themselves which would be used to prove identity. End users will be able to produce qualified electronic signatures and seals (QES) using an EUDI Wallet.
- **EUDI Wallet Providers –** They are Member States or organizations mandated or recognized by Member States that make the EUDI Wallet available to End Users. The terms and conditions of the mandate or recognition would be determined by each Member State. EUDI Wallet Providers are responsible for ensuring compliance with the requirements.
- **Person Identification Data Providers (PID) –** PID providers are trusted entities and are responsible for verifying the identity of the EUDI Wallet user, maintaining an interface to securely provide PID to the EUDI Wallet, and making information available for Relying Parties to verify the validity of the PID, without receiving any information about the PID's use.
- **Qualified Electronic Attestation of Attributes (QEAA) Providers –** Qualified EAA are provided by QTSPs. QEAA providers maintain an interface for requesting and providing QEAAs, including a mutual authentication interface with EUDI Wallets and potentially an interface towards Authentic Sources to verify attributes.

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- **Non-Qualified Electronic Attestation of Attributes (EAA) Providers –** Non-qualified EAA can be provided by any Trust Service Provider. While they are supervised under eIDAS, it can be assumed that other legal or contractual frameworks than eIDAS mostly govern the rules for provision, use and recognition of EAA.
- **Qualified and Non-Qualified Certificate for Electronic Signature/Seal Providers –** The EUDI Wallet enables the user to create qualified electronic signatures or seals.
- **Providers of other Trust Services –** Providers of other qualified or non-qualified Trust Services such as timestamps may be further expanded in future versions of the ARF.
- **Authentic Sources –** Authentic Sources are the public or private repositories or systems recognized or required by law containing attributes about a natural or legal persons. Authentic sources are sources for attributes on address, age, gender, civil status, family composition, nationality, education and training qualifications titles and licenses, professional qualifications titles and licenses, public permits and licenses, financial and company data.
- **Relying Parties –** Relying Parties are natural or legal persons that rely upon an electronic identification or a Trust Service. Relying Parties need to maintain an interface with the EUDI Wallet to request the necessary attributes within the PID dataset with mutual authentication. Relying parties are responsible for carrying out the procedure for authenticating PID and (Q)EAA.

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- **Conformity Assessment Bodies (CAB) –** The EUDI Wallets must be certified by accredited public or private bodies designated by Member States. QTSPs need to be audited regularly by Conformity Assessment Bodies (CABs).
- **Supervisory Bodies –** The supervisory bodies are notified to the Commission by the Member States, which supervise QTSPs and take action, if necessary, in relation to non-qualified Trust Service Providers.
- **Device Manufacturers and Related Entities –** EUDI Wallets will have a number of interfaces with the devices they are based on, which may be for purposes such as local storage, online Internet access, sensors such as smartphone cameras, IR sensors, microphones, etc, offline communication channels such as Bluetooth Low Energy (BLE), WIFI Aware, Near Field Communication (NFC) as well as emitters such as screens, flashlights, speakers etc, and smart cards and secure elements.
- **Qualified and Non-Qualified Electronic Attestation of Attributes Schema Providers –** (Q)EAA Schema Providers publish schemas and vocabularies describing (Q)EAA structure and semantics. It may enable other entities such as Relying Parties to discover and validate (Q)EAA. Common schemas, including by sector-specific organizations are critical for widespread adoption of (Q)EAAs.
- **National Accreditation Bodies –** National Accreditation Bodies (NAB) under Regulation (EC) No 765/2008 are the bodies in Member States that perform accreditation with authority derived from the Member State.

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Trust Service Providers

This defines ecosystem roles such as '*National Accreditation Bodies*' and '*Conformity Assessment Bodies*', ie. government-type organizations who will certify other participants to provide assurance of the ecosystem, and then '*EUDI Wallet Providers*', '*Person Identification Data Providers*' and '*Device Manufacturers*', where commercial players can fulfil specific service functionalities.

To zero in on the specific opportunity for vendor partners the Digital Wallet program includes a crucial component known as the **Trust Service Provider**.

A Trust Service Provider (TSP) is a designated entity that offers electronic identification, authentication, electronic signatures, and other trust services to facilitate secure electronic transactions. TSPs play a key role in establishing trust in the digital environment and are essential for the functioning of digital wallets and other online services.

In this guide they provide a detailed analysis on the different technical requirements that must be addressed considering the relevant standards. It also gives an overview of practical experiences on the move of trust services to the cloud.

Roles and Responsibilities of a Trust Service Provider

Trust Service Providers are integral to the success of the EU Digital Wallet program for several reasons:

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- **Digital Identity services:** Providing electronic identification services to verify the identity of users, offering authentication services to ensure the security of digital transactions and issuing electronic signatures to authenticate and validate electronic documents.
- **Ensuring compliance** with regulatory requirements and standards related to digital trust services. TSPs ensure that digital transactions comply with relevant regulations and standards, promoting legal certainty and consumer protection.
- **Protecting the confidentiality** and integrity of user data and transactions. TSPs help in enhancing the security of digital transactions by providing secure authentication and electronic signatures.
- **Facilitating interoperability:** TSPs play a role in facilitating interoperability between different digital services and platforms, making it easier for users to access and use digital wallets across the EU.

Most importantly as the name defines – **Building trust:** By offering reliable trust services, TSPs help build trust among users and businesses engaging in digital transactions.

Pilot Projects

As they write here the EU are investing €46 million from the Digital Europe Programme into piloting and enhancing the European digital identity (EUDI) wallet, for travel, health, banking, education and more.

This investment is supporting 4 pan-European pilot projects that will develop and test the usage of the EUDI wallet for individuals and businesses around a diverse range of everyday use-cases. These use-cases cover both public and private services with national and cross-border interactions.

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The 4 pilot projects involve more than 250 private and public organisations across almost every Member State, as well as Norway, Iceland, and Ukraine, and will run for at least 2 years. They represent a combined investment of over €90 million in the EU digital identity ecosystem, co-financed by the Commission at 50%.

They will work on 11 priority use cases to improve citizens' access to highly trusted and secure electronic identity means. The pilot projects will test the whole eco-system, from issuing the wallet to the user, to incorporating personal identity information, adding additional documents, and presenting this information to service providers.

- POTENTIAL – **Pilots for European Digital Identity Wallet Consortium.** The project will apply the EUDI wallet to 6 use-cases: Access to government services, Opening of a bank account, Registration for a SIM card, Mobile driving licence, eSignatures and ePrescriptions.
- EWC – **EU Digital Identity Wallet Consortium.** The project will test 3 use-cases: The storage and display of digital travel credentials, the organisation of digital wallets and the organisation of payments.
- NOBID – **Nordic-Baltic eID Wallet Consortium.** The project will focus on a single use-case: the use of the EUDI wallet for the authorisation of payments for products and services by the wallet user. It will address the issuance of wallets, the provision of payment means by financial institutions, and the acceptance of payment in a retail context.

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- DC4EU – **Digital Credentials for Europe Consortium.** The project will test the use of the EUDI wallet in the educational sector and the social security domain. The pilot project will align with the European Social Security Pass and the European Learning Model. It will use the European Blockchain Services Infrastructure (EBSI) in the context of the EUDI wallet.

Market Opportunity for Vendors and Entrepreneurs

The launch of the EU's digital identity wallet presents a significant market opportunity for vendors and entrepreneurs in several areas:

- **Development of Wallet Applications:** Vendors can create innovative applications that leverage the digital identity wallet's capabilities. These applications can range from secure login solutions for websites and mobile apps to identity verification services for online transactions.
- **Integration Services:** Entrepreneurs can offer integration services to businesses that want to incorporate the digital identity wallet into their existing systems. This includes developing APIs and software modules that enable seamless integration with different platforms and applications.
- **Consulting and Advisory Services:** As the adoption of digital identity wallets grows, there will be a need for consulting and advisory services to help businesses navigate the implementation process. Entrepreneurs can provide expertise in areas such as data protection, user experience, and compliance with regulatory requirements.

- **Security Solutions:** With the increasing importance of digital identity security, vendors can develop and offer advanced security solutions that complement the digital identity wallet. These solutions may include biometric authentication technologies, fraud detection systems, and encryption tools.

Conclusion

The EU's plans to launch a digital identity wallet present an exciting market opportunity for vendors and entrepreneurs. The wallet's convenience, security, and privacy features make it an attractive solution for individuals and service providers alike. By capitalizing on this opportunity, vendors and entrepreneurs can contribute to the growth of the digital identity ecosystem while offering innovative solutions to meet the evolving needs of the market.