Future Makers
Research Community

Decentralized Embedded Finance (DeEmFi):

Where finance becomes invisible, intelligent and everywhere

Atos

Executive Summary

Embedded finance (EmFi) was first introduced many decades ago, but the latest version was reinvented in the mid-2010s. EmFi represents a structural transformation in the way financial services are distributed and consumed. This model enables financial products and services from across payments, lending, insurance and investment to be integrated directly into non-financial platforms, applications, and digital ecosystems, bringing financial services closer to the exact moment and context in which users need them.

This Atos whitepaper examines the evolution of the EmFi ecosystem and explores its potential transition toward a new paradigm — Decentralized Embedded Finance (DeEmFi). While current embedded finance models primarily rely on traditional banking infrastructure and open APIs, DeEmFi envisions an evolution toward decentralized architectures built on blockchain technologies and Decentralized Finance (DeFi).

Now, DeFi is a financial model built on blockchain networks that enables services such as lending, payments, asset exchange and liquidity management without traditional intermediaries. Through smart contracts and open protocols, this introduces higher levels of transparency, programmability and automation into financial operations. When integrated into digital platforms through embedded finance models, these capabilities can foster a more interoperable, efficient and accessible financial ecosystem.

Over the past five years, regulatory frameworks such as Revised Payment Services Directive (PSD2) have acted as catalysts for the development of open banking, enabling third-party access to financial data and stimulating innovation in digital financial services. At the same time, advances in decentralized technologies, blockchain infrastructure, privacy-preserving technologies and autonomous AI agents — such as those enabled by the x402 protocol — are creating new opportunities to integrate financial services beyond the traditional boundaries of banking institutions.

Atos focuses its approach on designing and implementing embedded financial service platforms that leverage decentralized infrastructures, secure connectivity, intelligent process automation, regulatory compliance and advanced APIs to transform financial interactions across digital ecosystems.

This whitepaper aims to provide strategic guidance for banks, fintechs, distributors, and technology providers seeking to adopt, scale and lead the next generation of embedded financial services within an increasingly open, programmable and decentralized financial landscape.

Understanding the financial markets and projected growth market potential

Embedded finance (EmFi) is accelerating due to rapid digital consumption and the rise of platform-based ecosystems. Consumer behavior, digital adoption, demographic shifts (led by digital-native millennials and Gen Z), and the evolution of technology are reshaping how financial services are accessed.

The strong adoption of digital wallets, apps and online platforms is driving mainstream uptake of embedded finance.

McKinsey predicted the global embedded finance market is set to grow from €25 billion in 2023 to €100 billion by 2030 in Europe — a sharp rise within just 6 years. This highlights the strategic importance of embedded finance as a distribution channel for financial services in the region.

The same report indicated the global EmFi market is slated to grow from $148 billion globally in 2024 to $1.73 trillion by 2035. This does not just reflect the scaling of existing models but reiterates a fundamental transformation through DeFi integration.

This 31.53% global compound annual growth rate represents the convergence of regulatory frameworks, AI capabilities, and decentralized infrastructure, creating unprecedented value creation opportunities.

Decoding the Embedded Finance ecosystem

Embedded finance (EmFi) integrates financial services directly into non financial digital platforms, enabling seamless access to payments, banking, lending, investments and insurance.

The EmFi ecosystem consists of four critical stakeholders, as outlined below.

- End customers expect contextual, transparent and frictionless financial experiences within their preferred digital journeys.
- Distributors embed these services into apps, websites and marketplaces to enhance user experience and unlock value. Contextual offers, such as financing at checkout, can improve conversion rates by up to 30%. Distributors also gain new revenue streams and stronger customer loyalty through embedded financial interactions.
- Financial service providers, particularly incumbent banks, face rising competition within digital ecosystems, pushing them to redefine their value propositions. They must build stronger embedded finance strategies to retain relevance in decentralized customer journeys.
- Technology service providers enable this ecosystem through advanced capabilities in privacy tech, blockchain, AI and compliance.
- Players like Atos provide the foundational infrastructure needed for next generation embedded finance innovation.

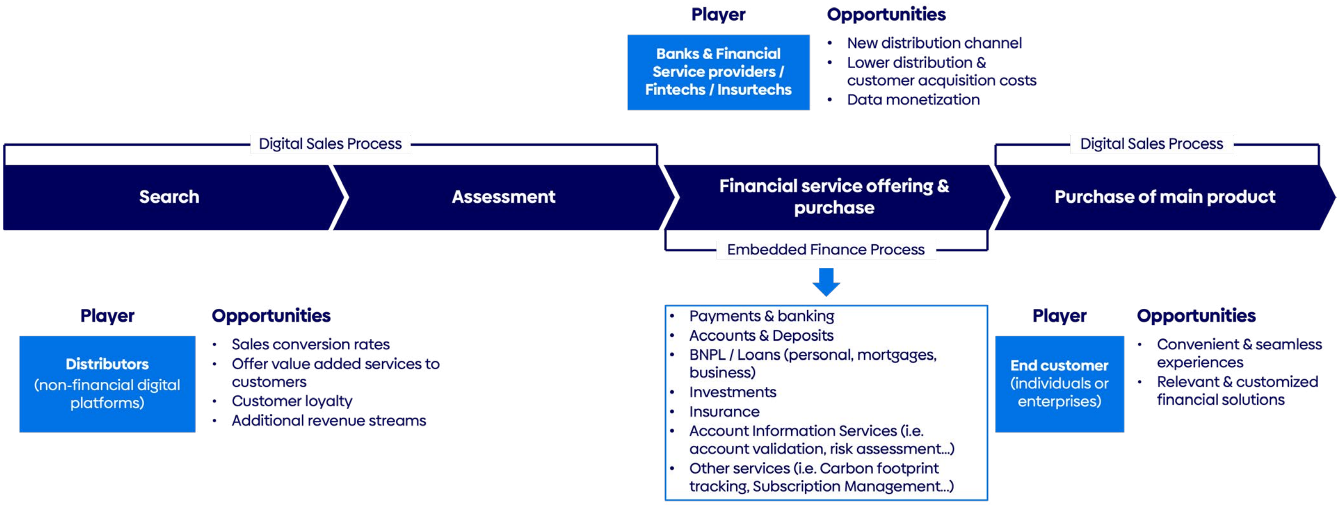


Fig 1: The EmFi ecosystem and customer experience

EmFi: Industry adoption and transformation in financial services

The adoption of embedded finance is driven by evolving customer expectations, which are redefining how financial services must be delivered.

End consumers increasingly demand seamless, contextual, and personalized experiences, where financial products are not accessed separately but embedded directly within their digital journeys. This shift is setting the foundation for new adoption models across the industry, requiring both traditional financial institutions and digital-native players like fintechs and neobanks to rethink how they design, distribute, and monetize financial services within broader ecosystems.

At the same time, data-centric value creation is emerging as a key enabler of this transformation. The ability to integrate and process real-time financial, behavioral, and external data is powering a more intelligent and responsive digital economy. As personalization becomes increasingly tangible for customers, financial interactions are evolving from discrete, standalone activities into continuous, embedded experiences.

In this context, both incumbents and challengers need to develop capabilities to leverage data effectively, enabling highly contextual, efficient, and scalable embedded finance solutions that align with the next generation of digital customers, their expectations and their individual journeys.

Navigating disruption: From a financial service provider's PoV

Financial service providers face distinct challenges based on their market position and organizational characteristics.

Established banks face significant challenges entering embedded finance as it disrupts their traditional, centralized models. Success requires a structured strategy, starting with assessing market opportunities across products and customer segments. Banks must evaluate internal capabilities and identify gaps in technology, data, regulatory understanding and ecosystem readiness. A clear capability-building roadmap should define required skills, infrastructure and partnerships across the full value chain.

Strong partnerships with non-financial distributors are essential for seamless embedded experiences. Building trust with these distributors is critical for scale, channel adoption and long-term competitive advantage.

Fintechs and neobanks are inherently better positioned to lead in embedded finance, given their digital-native environments and fewer legacy IT constraints. However, cybersecurity and fraud management remain critical priorities for them, and increasing regulatory scrutiny further amplifies this need as any weakness in fraud prevention or security can lead to significant reputational damage, particularly among retail customers for whom trust is paramount.

The EmFi evolution

Embedded Finance has reshaped financial distribution by embedding financial products directly into non financial journeys.

Wave 1 (2019–2024) was driven by regulatory liberation, with PSD2 enabling secure third party data access and igniting Europe's €25B open banking market. The EU has built a sequential regulatory stack: DORA –› MiCA –› eIDAS 2.0/EUDI –› PSD3/PSR/FiDA –› Digital Euro. Each of these reinforces the next. These frameworks create a unified data governance and identity backbone powering embedded finance expansion.

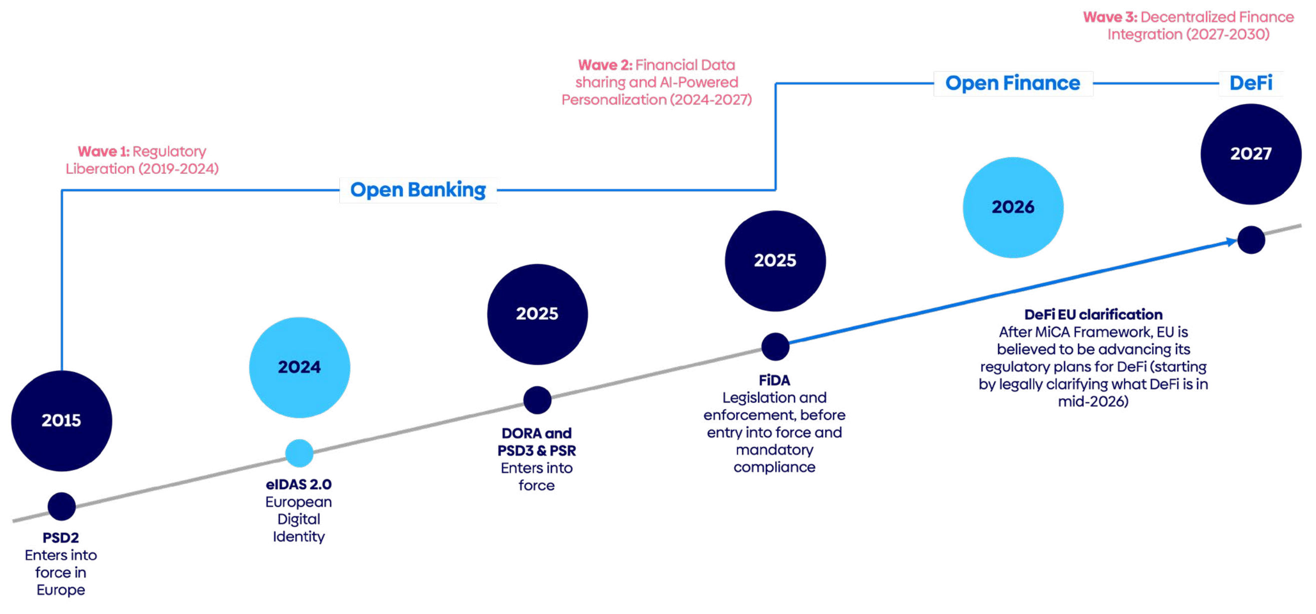


Figure 2: Key milestones in the evolution of Embedded Finance in Europe, from PSD2 and Open Banking to Open Finance and DeFi.

Wave 2 (2024–2027) shifts to AI powered personalization, enabling real time profiling, predictive risk scoring, and hyper tailored financial services.

FiDA regulation will expand open banking into full open finance, unlocking access to loans, mortgages, savings, pensions, insurance and crypto asset data.

More recently, the eIDAS 2.0 and the EUDI Wallet introduce frictionless, secure digital identity essential for cross platform financial interactions.

Wave 3 is the adoption of decentralized finance capabilities. As DeFi protocols mature, embedded finance integrates decentralized liquidity, autonomous services and privacy first architectures. Blockchain, privacy preserving tech and autonomous AI agents enable compliant, intelligent and intermediary light financial delivery models.

Organizations that navigate the convergence of traditional regulatory frameworks and decentralized innovation will emerge successful, sustainable and secure.

EmFi in the real world

Several established banks have successfully implemented embedded finance solutions:

BBVA developed treasury APIs designed to simplify cash flow management or Corporate and small and medium-sized enterprises (SMEs) within their ERP platforms.

HSBC entered a strategic joint venture with Tradeshift to expand deployment of embedded financial services across digital commerce platforms.

ABN Amro makes EmFi solutions available to small and medium-sized enterprises (SMEs) clients.

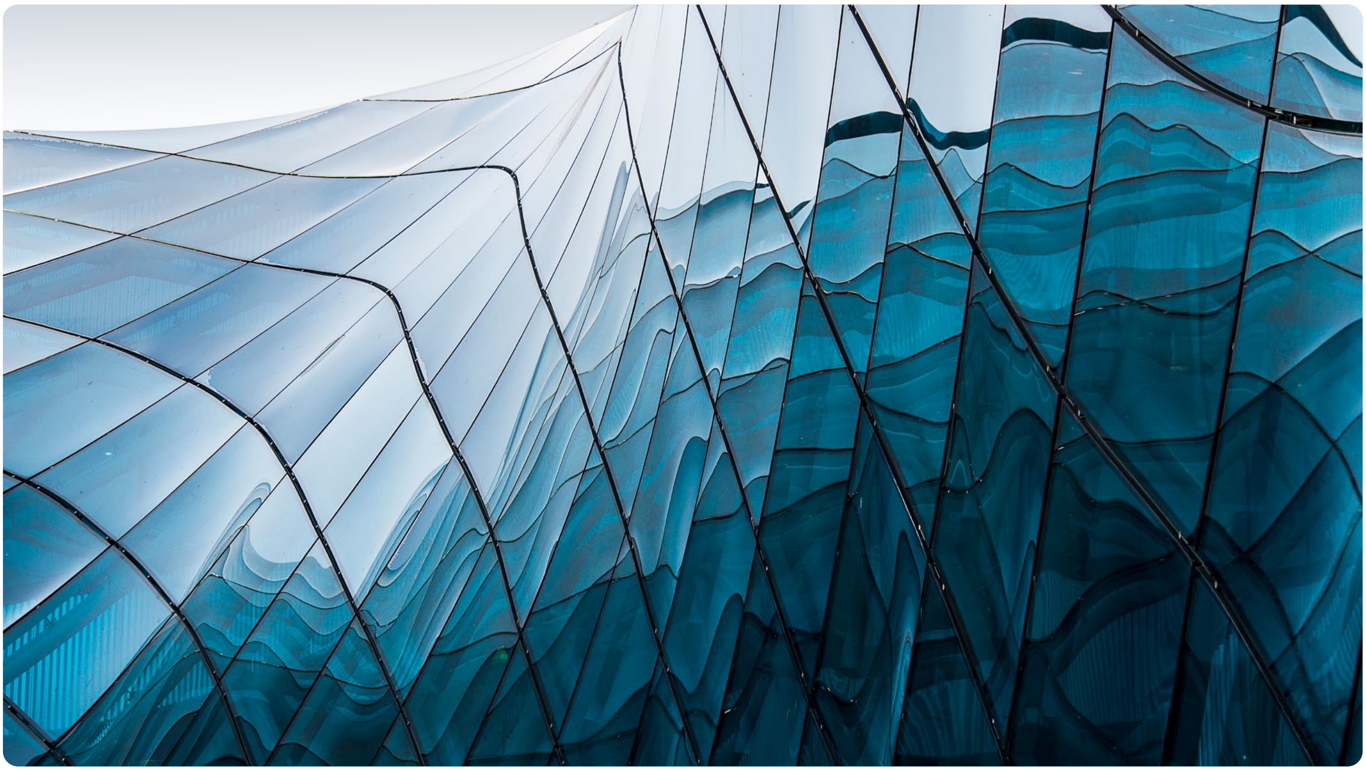
Next-gen use cases for IoT and autonomous systems

The next wave of embedded finance brings banking everywhere, enabling autonomous devices, vehicles and robots to trigger real-time, frictionless payments based on usage and predicted needs.

Machine-to-machine transactions allow agentic AI, IoT assets and self-driving cars autonomously purchase services, manage subscriptions and handle insurance payments or maintenance. Enterprises embed credit, liquidity and smart-contract-driven payments directly into ERP systems, turning corporate ecosystems into fully integrated financial networks.

Atos envisions Decentralized Embedded Finance (DeEmFi) as the next leap, creating a framework that facilitates the following:

- A blend of traditional and decentralized finance: Unifying decentralized opportunities with traditional finance under a compliance-first architecture
- Increased hyper-automation: Cutting-edge process automation supports intelligent financial agent orchestration
- Faster modular progression: Organizations can progressively adopt DeEmFi capabilities, tailoring implementations to align with technology maturation and regulatory stability



The leadership guide to a successful DeEmFi implementation

Legacy system integration frameworks enable traditional financial infrastructure to participate in decentralized ecosystems through protocol translation, data format conversion and secure interoperability layers that bridge conventional banking environments with emerging decentralized networks.

However, the successful adoption of **embedded finance (EmFi)** and its evolution toward **Decentralized Embedded Finance (DeEmFi)** is not only a technological challenge but also a strategic transformation.

Organizations must evaluate how embedded financial services impact their market positioning, product strategy, operating models, and ecosystem partnerships. Successful DeEmFi implementation requires addressing critical technical dimensions.:

1

Technical assessment and architecture design:

Evaluate legacy infrastructures, identify integration requirements, and define scalable architectures capable of supporting both traditional and decentralized financial capabilities.

2

Ecosystem and partnership enablement:

Check for relevant and global partners such as financial institutions, FinTech providers, and technology platforms that enable embedded finance services.

3

Regulatory compliance:

Ensure compliance with evolving financial regulations while enabling innovation through privacy-preserving technologies and secure data-sharing frameworks.

4

Privacy-enhancing solutions:

Securely embed financial services into digital ecosystems while maintaining strict compliance with data protection and regulatory requirements.

5

Future-proof financial services:

Check solutions and business plans to objectively assess if the newly-embedded financial services are aligned with decentralized financial capabilities.

6

Roadmap definition and transformation governance:

Establish clear implementation roadmaps that align business objectives, technology modernization, regulatory considerations and ecosystem collaboration.

7

Visionary technological focus:

Position DeEmFi as a transformative step toward intelligent, decentralized financial paradigms that redefine how financial services are delivered within digital platforms.

8

Strategic advisory for embedded finance:

Partner with a strategic global transformation expert like Atos to assess the business impact of embedded financial services, define market positioning, prioritize product opportunities and design sustainable ecosystem strategies.

What comes next: The journey to DeEmFi

The evolution from Embedded Finance (EmFi) to Decentralized Embedded Finance (DeEmFi) marks a profound shift in how financial services are designed, distributed and consumed within digital ecosystems.

What began as the integration of financial capabilities into digital platforms is rapidly evolving into a new financial architecture — one that combines open financial data, intelligent automation, decentralized infrastructure and privacy-preserving technologies.

In this emerging paradigm, financial services will no longer be confined to traditional banking interfaces. Instead, they will become contextual, intelligent, and seamlessly embedded within everyday digital journeys. By 2030, customers will increasingly access financial services through the platforms they already use, such as e-commerce marketplaces, travel applications, enterprise systems, and digital platforms. These services will be highly personalized through AI-driven insights, instantly delivered through intelligent orchestration of financial providers, and inherently trustworthy because of secure digital identity frameworks such as the EUDI Wallet and compliance-enabled architectures.

Successfully navigating this transition requires more than technological capability.

Organizations must rethink their market positioning, product strategy, ecosystem partnerships, and operating models while modernizing their technology foundations to support open, programmable, and increasingly decentralized financial infrastructures.

How Atos is empowering stakeholders in the DeEmFi ecosystem

The transition toward **DeEmFi** represents a critical opportunity for financial institutions, fintechs, distributors, and digital platforms to redefine how financial value is created and delivered. Organizations that successfully combine regulatory readiness, ecosystem collaboration, intelligent automation and decentralized capabilities will be best positioned to lead the next generation of financial services.

Atos combines technology leadership with strategic consulting capabilities to support organizations in identifying how embedded finance can unlock new revenue streams, strengthen customer engagement, and create differentiated digital ecosystems. This includes helping clients assess their current capabilities, prioritize the most relevant financial products and use cases, and define the optimal approach to integrate financial services into their platforms. With focused commitments to Agentic AI, Cybersecurity and Sovereignty, the Atos Group is uniquely poised to empower stakeholders and support them in their shift to DeEmFi.

Atos enables organizations to navigate the full transformation journey — from opportunity identification to large-scale implementation by combining deep and proven game-changing expertise in consulting, system integration, digital identity, privacy-enhancing technologies, blockchain, and intelligent orchestration.

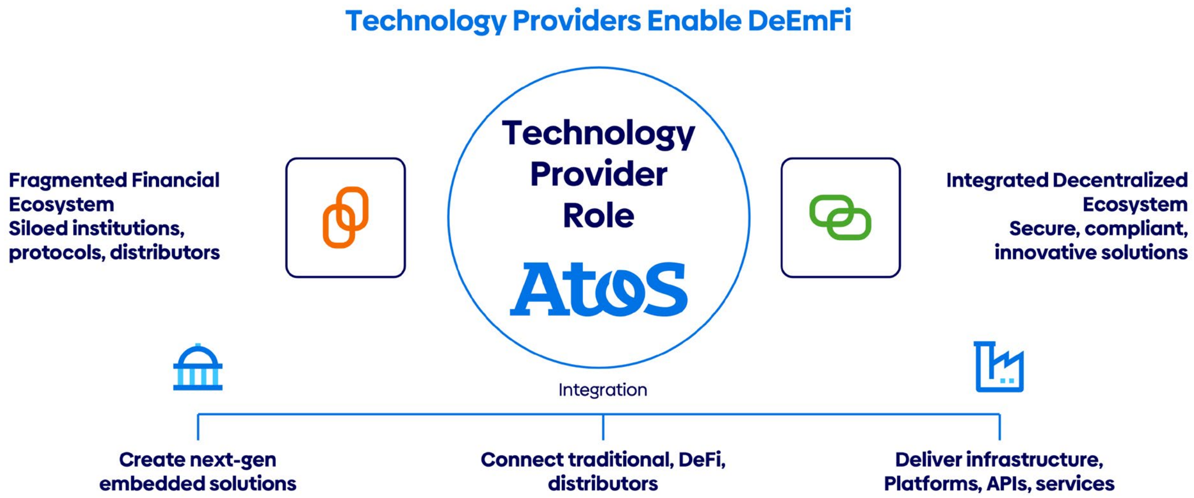


Figure 3: Technology providers enabling the transition from Embedded Finance to DeEmFi.

Atos is positive that DeEmFi is a transformative step toward intelligent, decentralized financial paradigms that can redefine how financial services are delivered within digital platforms.

Atos supports clients in defining their embedded finance strategy, prioritizing high-value use cases, establishing the right ecosystem partnerships, and implementing scalable platforms that enable long-term innovation. Through this combined approach, we aim to enable these organizations to move from experimentation to scalable embedded finance platforms, preparing them to lead in the next generation of digital financial ecosystems.

By guiding clients across strategy, ecosystem development, and technology implementation, Atos enables organizations to transform embedded finance from an emerging capability into a sustainable competitive advantage, shaping the future of open and decentralized financial ecosystems.

>> **Connect with the Future Makers Research Community** to explore how you can reassess your business strategy, move toward DeEmFi, strengthen your ecosystem partnerships, and build the digital foundations needed to scale securely and confidently.

>> Find out more about Atos's expertise in the banking, insurance and financial sector: https://atos.net/en/industries/financial-services-and-insurance

>> Learn more about the Atos Group's commitment to **Agentic AI, Cybersecurity and Digital Sovereignty**.

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José is the Head of Financial Services in Atos Amplify for Iberia at Atos, based in Madrid. He is a senior executive and consultant specializing in digital transformation, operating model redesign, and business-technology integration in financial services.

His expertise spans retail and commercial banking, AI & data-driven transformation, open finance, and operational efficiency, with a strong focus on delivering scalable, customer-centric solutions.

Throughout his career, he has led large-scale international transformation programs at BBVA and other institutions, including the rollout of a fully digital customer relationship model.

He is driven by a passion for reshaping financial services through innovation, combining strategy, technology, and execution to create sustainable business impact.

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Hedeyeh Taheri

Head of Client Innovation for Financial Services, **Atos**

Hedeyeh is the Head of Client Innovation for Financial Services & Insurance at Atos, based in Toulouse.

She is focused on helping financial institutions translate emerging technologies into tangible business outcomes by leveraging her expertise in decentralized finance (DeFi), decentralized AI, Web3 and blockchain.

Hedeyeh has a strong track record in shaping strategic client engagements, leading pre-sales initiatives, and generating new opportunities alongside banking clients. Additionally, she is particularly passionate about how the accelerating digitization of finance is reshaping the industry, with Web3 becoming a key focus area, and strongly believes this transformation should be approached with a strong emphasis on security, trust and European technological sovereignty.

She is keen to help financial institutions navigate this shift responsibly, unlocking new value while building resilient, future-ready ecosystems.

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Christophe Visentin

CTO Financial Services, AI, Web3 & Digital Assets, **Atos**

Christophe is based in Toulouse, France.

As Chief Technology Officer, he supports innovation, technologies and vertical solutions for the Atos Group in the French region, with a focus on the Financial Services sector.

He is also actively involved in positioning key trends such as Agentic AI and Web3 inside Atos and is convinced the intersection of AI and Blockchain is set to redefine the future of Financial Services.

Christophe strongly believes Decentralized AI is a critical driver for this shift, particularly regarding security and sovereignty—strategic pillars where Atos maintains a commanding presence.

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Philippe Bodden

Enterprise & Security Architect, **Atos**

As an Enterprise & Security Architect, Philippe has been a pivotal figure at Atos Belgium and predecessors since 1995.

His core areas of focus encompass Post-Quantum Cryptography (PQC), Privacy Enhancing Technologies (PET), security architecture, risk management, as well as application, middleware, and technical architecture.

Over the course of his career, he has excelled in projects spanning the financial sector and national and European public institutions.

As part of the Atos Expert Community and now the Atos Future Maker Research Community, Philippe is recognized in activities around Quantum, Security and Cryptography.

Philippe's extensive list of certifications includes SABSA, CISSP, CSSP, TOGAF, COBIT, CIPP/E, and CIPT.

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About Atos Group

Atos Group is a global leader in digital transformation with c. 56,000 employees and annual revenue of c. €7.2 billion (at the go-forward perimeter), operating in 54 countries under two brands - Atos for services and Eviden for products and systems. European number one in cybersecurity and a leader in cloud, Atos Group is committed to a secure and decarbonized future and provides tailored AI-powered, end-to-end solutions for all industries. Atos Group is listed on Euronext Paris.

Find out more about us
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Let's start a discussion together

About the Future Makers Research Community (FMRC)

The Future Makers Research Community is a global network of our Future Makers - exponential thinkers and forward-looking technology thought leaders - across Atos.

Our Future Makers are united by profound curiosity, a strong growth mindset and a passion for shaping the future through exponential technologies applied in a deep industry context. We collaborate on thought leadership, (co)-innovation and R&D across all innovation horizons, and our ambition is to elevate organizations and drive lasting impact.

In close co-creation with our clients and partners, we deliver bold ideas and industry use cases, by anticipating trends and market needs that will reshape businesses and society.

Together, we're not just imagining the future — we're building it.

Find out more about us

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