

Uses of DLT in the EU banking and payments sector: EBA innovation monitoring and convergence work

Interest, experimentation and application

A gradual uptick in experimentation with and use of Distributed Ledger Technologies (DLT) has been observed over the last years in the EU banking and payments sector. While activity appears still limited and many projects are still at early stages, the EBA is actively undertaking an assessment of the use cases and opportunities and vulnerabilities that may arise in order to ensure the supervisory and regulatory framework remains fit-for-purpose. To-date, most use cases explored do not seem to directly impact consumers, however the EBA continues to monitor market developments to ensure that consumers continue to benefit from high level standards of protection.



DLT refers to protocols and supporting infrastructure that allow computers in different locations to propose and validate transactions and update records in a synchronised way across a network.

The EBA's role

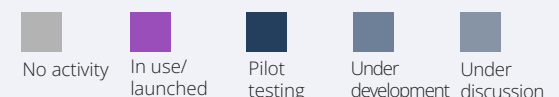
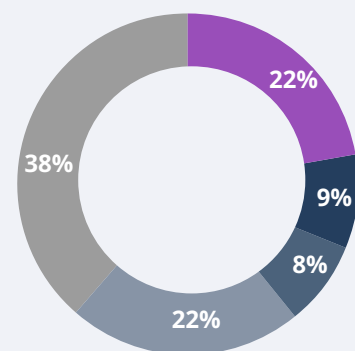
The EBA has a statutory duty to monitor and assess market developments, including financial innovation, and to achieve a co-ordinated approach to the regulatory and supervisory treatment of new or innovative financial activities.

In accordance with this mandate and the EBA's priority thematic work on innovative applications that, for 2023 included Artificial Intelligence/Machine Learning, digital identities and DLT, the EBA took a deeper look at uses of DLT by EU credit institutions, payment institutions and e-money institutions (referred to hereafter as 'financial institutions'). As part of its work, in 2023 the EBA collected information and engaged with both national competent authorities and a range of industry stakeholders that ensured geographical, size, use case and business model diversity, and is taking forward more in-depth analysis in 2024/25.

In line with the EBA's objective to ensure that the regulatory and supervisory framework is technology neutral and fit for purpose in the digital age, the EBA is carrying out analysis with the objectives of:

-  **identifying the use cases** in which DLT is being explored, tested, piloted or adopted by financial institutions; and
-  **assessing potential opportunities and vulnerabilities** with a view to informing potential supervisory approaches, specifically as regards permissibility of DLT use.

Engagement of credit institutions with DLT



The [EBA Risk Assessment Report December 2023](#) shows a notable level of engagement of EU/EEA credit institutions with DLT experimentation. Indeed, more than 60% of surveyed EU banks are currently exploring, experimenting or using DLT solutions, with 22% of surveyed banks already using DLT applications.

Observed use cases and market trends

To-date, the EBA has observed a considerable number of financial institutions already experimenting DLT applications in a diverse set of use cases. In total, the EBA considered around 40 projects based on NCAs' feedback in 2023; of these, around 12 were analysed in more detail. In the projects reviewed by the EBA to-date, the DLT is mainly applied for record keeping purposes, for clearing and settlement, for loyalty programmes and rewards, for value storage and transfers and for identity attestations. The projects analysed range from the exploration phase to full roll-out phase. Overall, the adoption of DLT in the financial sector is **still at an early stage**, with

the majority of projects being typically at a preliminary stage and not having yet a material impact on clients at a broad scale.

In its work to date, the EBA has focused on uses of DLT that do not entail issuance activities or other services in the scope of the [Markets in Crypto Assets Regulation \(MiCAR\)](#). Rather, the EBA targeted DLT uses for substituting legacy systems in traditional banking and payments use cases.

The reasons why financial institutions explore and experiment with DLT solutions heavily depend on the concrete use case. In its work, the EBA has focussed on 5 main categories of use cases in which financial institutions seem to engage more/where experimentation seems more advanced.

Main use cases identified



Record Keeping: Use of DLT to store and keep records of transactions, mortgages, contracts and other documents, and to reconcile bilateral accounts.

Financial institutions consider the DLT is able to significantly enhance transparency and information sharing: whenever an entry is approved by the system, all copies of the ledger are automatically updated. In addition, the ledger can be used as an audit trail.



Clearing and Settlement: Use of DLT for atomic settlement and for netting positions between participant nodes.

The use of DLT in the financial sector for clearing and settlement is deemed to improve efficiency, as it allows for near instant 24/7 settlement and reduces the number of intermediaries involved in each transaction. Additionally, the use of smart contracts can automate several operations thus allowing for streamlined processes.



Loyalty programmes and Rewards: Use of DLT to distribute tokens to reward customers that perform certain actions or choose specific services (e.g. green energy, sustainable programmes, etc).

The tokens are issued on a blockchain and can be redeemed in exchange for goods, services, discounts or prizes, therefore potentially increasing customer satisfaction and thus loyalty.



Value storage and transfers (retail): The DLT is used vis-à-vis retail customers that hold funds with the intermediary and want to initiate transfers, for instance in the form of tokenised funds for Machine-to-Machine payments and micro-payments.

Experimentation in this field are driven by the consideration that the DLT has the potential to improve efficiency, to allow for greater degrees of programmability in payments, and to provide innovative solutions to meet customers' expectations.



Identity Attestations: The DLT is used to ensure safe means to digitally store and use identity attestations, for example in the context of tokenised identities.

Financial institutions are experimenting the use of DLT in the context of e.g. tokenised identities and self-sovereign identities as it is considered as a technology able to increase security and provide an immutable record of interactions.

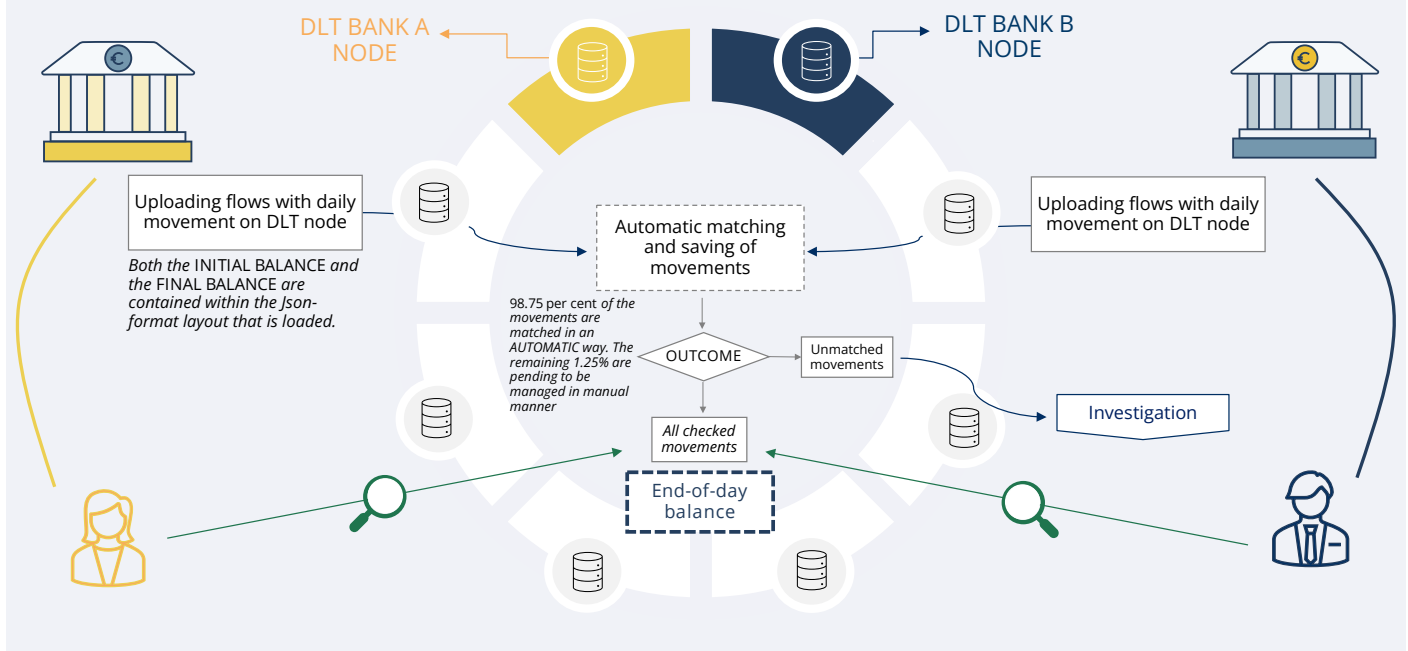
Record keeping use case successfully rolled out

In Italy, every bank has a bilateral account (like nostro and vostro accounts) with each bank it transacts with, where input and output movements are written. The reconciliation process for interbank transactions is traditionally complex, labour-intensive and time-consuming. In addition, banks only used to have the overview of the accounts they owned while they lacked real-time visibility on the account that are owned and managed by their counterparties.

In this context, between 2017 and 2020 the Italian market has developed a permissioned DLT platform to simplify the processes related to interbank reconciliation of bilateral accounts; the platform became operational in March 2020. By sharing common data in a secure manner, the DLT platform allows banks to quickly identify any misalignments in interbank transactions. It also allows them to perform checks and exchanges directly within the application and to use standardised processes and

communications to correct potential problems.

Today, the network has reached 91 nodes/banks and represents a total of 95% of Italian banks now exchanging interbank data exclusively via the DLT platform. The DLT's features of immutability, security and transparency offer the opportunity to simplify processes and to increase the dialogue and the interconnection within the ecosystem. The distributed nature of the ledger allows each bank to make available to each counterparty, simultaneously and continuously, the information necessary for the management of the mutual account entries. Both counterparties can keep a constantly aligned copy that provides each participant bank with full visibility of their own accounts. The entries in the bilateral accounts are automatically checked and validated in real-time, with only a small share (around 1%) requiring a manual investigation.



The allocation of resources to DLT experimentation and adoption by financial institutions appears to be driven by two factors:

- 1 **customer demand**, for innovative services, albeit that only a few DLT projects assessed to-date were reported as having a material impact on clients at a broad scale, provided that most of them are at a very early stage or not fully live; and
- 2 the perceived need to **prepare and position the financial institutions for future developments**, including a scenario in which the use of DLT is more mature and widespread.

Additionally, some financial institutions cite recent regulatory developments as facilitating DLT experimentation, either directly (pursuant to the DLT Pilot Regime) or indirectly by providing regulatory clarity as to the status and regulatory expectations toward specific services.

Potential opportunities and vulnerabilities

The EBA has identified a number of potential opportunities arising from the use of DLT by financial institutions.



Programmability: programmability features are enabled by smart contracts, i.e. computer programmes stored on the blockchain and run when predetermined conditions are met. Smart contracts are designed to facilitate financial transactions among blockchain users, without the need for trusted intermediaries that characterises traditional finance. As smart contracts can automate several operations or develop key features of a DLT application or crypto-asset, they offer the possibility to reduce the number of intermediaries involved in transactions, thus improving efficiency and boosting innovation.



Increased transparency and improved information sharing: whenever a transaction is approved by the system, all copies of the ledger are automatically updated. In addition, the ledger can be used as an audit trail, as information on the blockchain is difficult to be tampered with or to be modified retroactively.

See also the [EBA's Report on prudential risks and opportunities arising for institutions from FinTech](#)



Decentralised nature: by distributing control and decision-making powers across multiple nodes or participants, there is not a single part of the blockchain that, if malfunctioning or compromised, would cause the failure of the entire DLT system.

In terms of potential vulnerabilities, the EBA has identified a **lack of experience with the technology and compliance uncertainties** (e.g. in the context of AML/CFT, outsourcing and data protection) given the relative novelty of DLT use cases that, in turn, **may give rise to additional operational risks**.

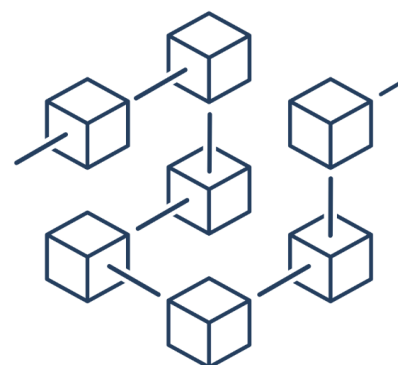
For instance, despite the lack of a single point of failure, blockchains can still be vulnerable to other types of attacks (e.g., 51% attacks, that is a coordinated effort to control 51% or more of the validation nodes or staked native token of a blockchain, which in turn allows influence over the blocks that are added to the chain) and failures (protocol and software vulnerabilities could potentially compromise the entire network).

In view of these risks, and in conformity with effective governance and sound risk management policies, financial institutions reported staff recruitments, training and the development of appropriate frameworks to identify and mitigate operational risks, with a focus on IT risks, cyber risks and fraud risks.

Regulatory initiatives as a driver for innovation

The adoption of key EU policy initiatives like MiCAR and the DLT Pilot Regime that were part of the European Commission's Digital Finance Strategy, enhanced regulatory clarity and was reported by financial institutions as fostering the development of DLT-related use cases in the EU.

In particular, the DLT Pilot Regime represents a regulatory initiative whose aim is to boost innovation for the trading and settlement of transactions in crypto-assets that qualify as financial instruments under MiFID, while facilitating the set-up of new types of market infrastructures (i.e. DLT multilateral trading facilities, DLT settlement systems and DLT trading and settlement systems). It also introduces a sandbox approach, thanks to which eligible financial institutions can test and apply DLT technology in a protected and closely supervised environment. As suggested in the [Joint-ESAs Report on Innovation Facilitators](#), the use of innovation facilitators and especially Regulatory Sandboxes represents an opportunity for financial institutions to understand the application of the regulatory framework with regard to the innovative proposition, reducing uncertainty and pushing innovation.





Type of DLT and governance

DLT systems usually consist of several layers commonly known as Layer 1 (the foundational or base layer, generally a blockchain, where transactions are recorded), Layer 2 (the application layer, composed of applications powered by smart contracts) and Layer 3 (the user-facing layer). The DLT concretely used by financial institutions varies between use cases, with an observed preference for permissioned blockchains (i.e. a type of distributed ledger composed of linked blocks to record and verify data). Financial institutions seem to prefer permissioned solutions to ensure that only prior authorised users are allowed to access the blockchain and perform certain tasks. To reconcile the preferences for interoperability (typically achieved via permissionless layer 1) and control, financial institutions are increasingly introducing the permissioned element at the application layer. This trend seems driven by the fact that market participants are attempting to improve scalability of their solutions, which appears to be easier achieved by using permissionless blockchains in layer 1.

Next steps

In 2024/2025, the EBA will continue to monitor the level of experimentation with and adoption of DLT and the use cases involved. In parallel, the EBA intends to carry out a more detailed assessment of specific aspects that could give rise to material opportunities and vulnerabilities in a scenario where DLT applications are adopted more broadly, with a view to promoting convergence in supervisory approaches to these technologies.

A thematic report with the EBA's findings will be published in 2025. To carry out this work, the EBA will actively engage with the market and will organise a workshop in early 2025. Financial institutions active in the field are encouraged to get in touch via FinTech@eba.europa.eu.

