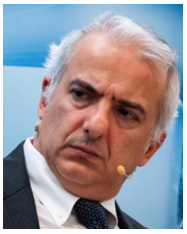
Moving an entire banking sector onto DLT: The Italian banking sector use case



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Abstract Blockchain technology has in recent years gained significant appeal worldwide in view of its potential to transform the way we do business. In this regard, one of the most attractive architectural concepts is the consortium Blockchain, where a group of peers, leveraging a common governance, collaborate to define rules and technology development. A consortium Blockchain is highly beneficial in a setting where multiple organisations operate in the same industry, but it is not immune from challenges, including investment, education and data standardisation. This paper provides an analysis of the evolution of Blockchain and Distributed Ledger Technology (DLT) technologies and the regulatory approach along with a practical case study on the use of Blockchain in the Italian banking sector. This sector has successfully pioneered the use of Blockchain/DLT with a new application, Spunta Banca DLT, for straight-through processing of interbank reconciliation. Finally, challenges, opportunities and important learnings are discussed.

KEYWORDS: Blockchain, Distributed Ledger Technology, banks, technology, infrastructure, consortium Blockchain, governance, finance

INTRODUCTION[1]

Blockchain/Distributed Ledger Technology (DLT) can offer an extensive range of applications, although many of these are yet to be fully explored, tested and developed. This technology can impact several core banking processes and areas, including

- Payments (intra-/interbank transfers, P2P payments, value-added services with cryptocurrency, etc.)
- Finance (trading, post trading, collateral management, etc.)
- Credit (finalised credit, escrow, trade finance, loyalty programme, etc.)
- Know Your Customer (KYC; applicable across all areas) and security

There are multiple other vertical operational areas such as timestamping and notarisation services, various supply chain areas as well as services by digital autonomous insurance that could easily be seen to have potential use of this new technology.

The attention to this technology from the finance industry is quite profound. In 2019 almost 500 use cases of Blockchain and DLT projects were registered in Italy. Only a small part of these projects, however, was ready to be implemented, mostly in the financial sector.

These results get further support from the analysis conducted by Gartner, which was presented during the IT symposium on investment strategies of companies in proof of concept (PoC) in November 2019.[2] Investment during the period 2017–2019 was noted to have been made primarily in the banking sector and securities.

In 2017 the finance component accounted for no less than 75 per cent of the total. In the following years, the focus was somewhat more widely distributed across different sectors, and the weight of the banking sector has fallen to 30 per cent. A growing trend has been seen during the last two years in the communications, media and services sectors, manufacturing, natural resources as well as government.

Among the numerous initiatives in the field of finance, the activities carried out directly by central banks are particularly noteworthy. From the white paper of the World Economic Forum (March 2019),[3] it emerges that central banks are focusing on 10 major areas where Blockchain and DLT can make processes significantly more efficient. These areas are as follows:

- Retail central bank digital currency (CBDC)
- Wholesale central bank digital currency (CBDC)
- Interbank securities settlement
- Payment system resiliency and contingency
- Bond issuance and life cycle management
- Know your customer and anti-money laundering
- Information exchange and data sharing
- Trade finance
- Cash money supply chain
- Customer SEPA Creditor Identifier (SCI) provisioning

In recent years, banks have been evolving the operational approach towards this innovative technology: from an individual approach to ecosystem projects, through participation both in international consortia and in sectoral initiatives.

BLOCKCHAIN IN ITALY

From the ABI Lab survey on the main information and communications technology (ICT) priorities (see Figure 1), a clear picture is emerging: 48 per cent of responding banks indicated Blockchain technologies and DLT were within the top ten of their investment priorities, and if this is narrowed down further to focus only on the cluster of larger banks the percentage rises to 70 per cent.

The following chart depicts the areas of application that Italian Blockchain and DLT banking projects are covering.

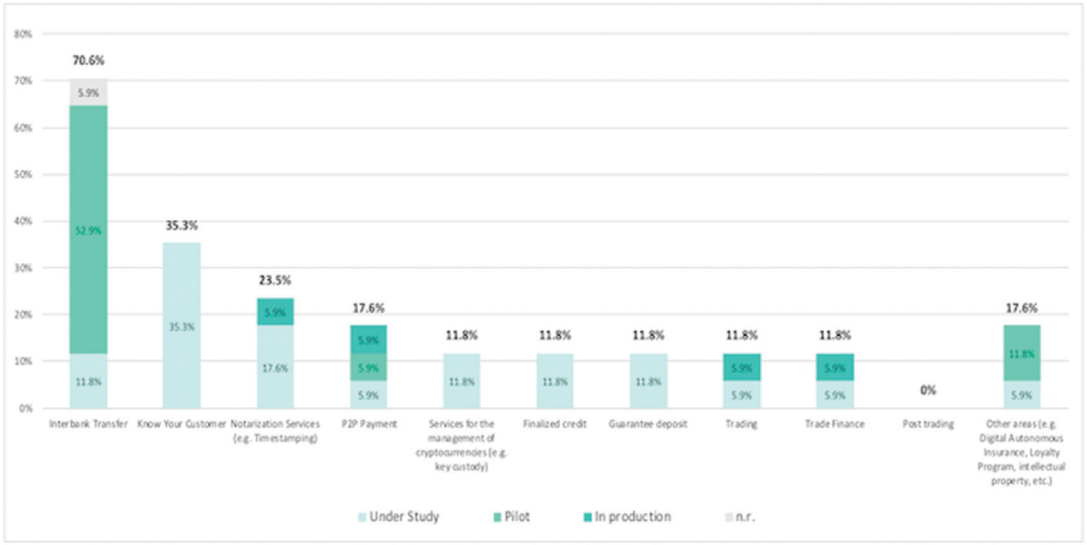

Figure 1: Areas of application of Blockchain/DLT projects in Italian banks.
Source: ABI Lab Annual Report on ICT investment priorities, March 2020.

As the chart shows, intra-/interbank represents the largest area of investment, driven mainly by the Spunta Banca DLT project. In the other areas, however, most projects are still in the planning phase, most notably KYC, notarisation services and P2P payments. Overall, there are still a limited number of projects and applications that are already in production.

Most of the projects highlighted by the banks (23 out of 38 cases — 60.5 per cent) used a permissioned network, while 4 cases (10.5 per cent) used a permissionless network (the rest did not indicate the type of configuration).

REGULATORY ASPECTS AND APPROACH

Regarding regulations, currently no single uniform approach is in place. This, however, is not unusual for this phase of new and innovative technologies. The fragmented regulation is also merely a consequence of the different approaches taken.

In some countries the first attempts at regulation have focused on specific aspects (typically, initial coin offerings (ICOs) and payments with cryptocurrencies), while others have tried to provide a clearer definition and a very broad interpretation that inevitably misses the element of detail and depth.

The important aspects, from a regulatory point of view, are, of course, varied and are summarised in Figure 2.[4]

Among these important elements listed, the attention of regulators is primarily on the digital assets and thus the whole universe concerning the definition and classification of cryptokits with specific focus on the theme of ICOs. The area of smart contracts is obviously a subject of attention referring to the standard adopted rule that 'code is law' as well as new scenarios that arise in terms of contractual procedures. Other 'hot' areas are, of course, aspects of governance and responsibility in data management primarily in terms of immutability and confidentiality.

THE INITIATIVES OF REGULATOR AT INTERNATIONAL LEVEL

The Resolution of 3 October 2018 on distributed registry and Blockchain technologies states the following:

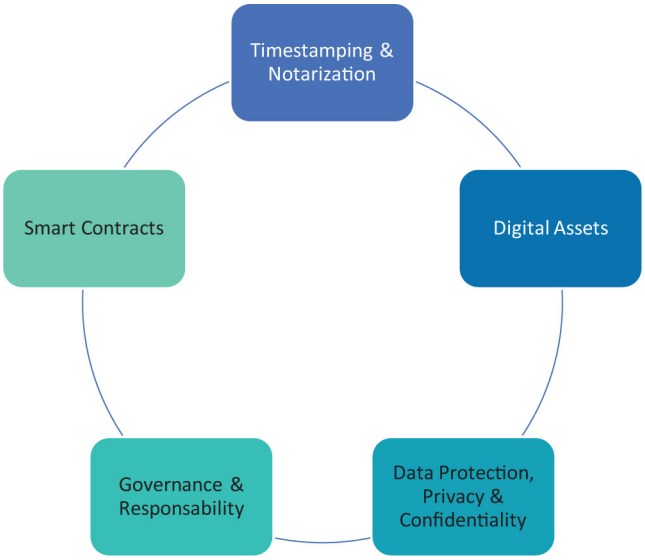

Figure 2: Main issues to be addressed in Blockchain.
Source: NTT Data, Upgrade. Unable. Replace. Disrupt: 4 ways Blockchain will reshape your business, 2018.

'building trust through disintermediation', approved by the European parliament, underlines the importance of DLT in financial intermediation and its potential for improving transparency and reducing transaction and other hidden costs through better data management and process simplification. The resolution 'encourages the Commission and competent national authorities to promptly acquire the technical skills and regulatory capacity that allow for rapid legislative or regulatory action, if and when appropriate'. More specifically, it is emphasised that the uses of the DLT must comply with the European Union (EU) data protection legislation, in particular the general regulation on data protection (GDPR), inviting the Commission and the European Data Protection Supervisor of data (EDPS) to provide further guidance on this point. The latter is certainly a point of importance, considering that the specificities of some DLT configurations (eg record immutability) conflict with some of the rights of the interested parties, such as the right to deletion and modification of personal data.

The European Commission has been very active on the Blockchain/DLT front for some years now. In February 2018 the Commission, with the support of the European parliament, activated the EU Blockchain Observatory and Forum, which aims to explore application development based on Blockchain technology that can contribute to the European single market.[5] On 10 April 2018, the 21 member states signed a declaration for the creation of the European Blockchain Partnership (EBP). This is a collaborative project for the development of DLT, promoted by the European Commission, which has so far garnered the participation of 29 countries — including non-member countries of the Union that belong to the European Economic Area — which aims to exchange experiences and skills in order to create a single technological standard for the whole of Europe. The group also has the task of identifying the sector's digital cross-border public services that could be implemented through a common European infrastructure of Blockchain services that adopt a shared model for governance. According to the objectives of the partnership, infrastructure development is due to start this year and will make it possible to securely share

information such as EU customs and tax data, audit documents of funded projects, cross-border certification of diplomas and professional qualifications and digital identities (eIDAS).

THE FIRST INITIATIVE AT INDUSTRY LEVEL IN ITALY: SPUNTA BANCA DLT

Several use cases have been created to test and experiment with Blockchain technology/DLT. The Italian banking sector is among the first to take concrete steps in this area, going beyond a phase of testing to bring into production a tangible initiative that involves the entire banking sector. The project Spunta Banca DLT, coordinated by ABI Lab and promoted by ABI, was initiated in 2017, when ABI Lab and NTT data started to work on a DLT PoC for reconciliation of bilateral accounts on the Corda Enterprise platform.

The construction of the infrastructure for Spunta Banca DLT led to the creation of a functional space to host other use cases and include different actors in its governance. ABILabChain is the business zone of the Italian Banking Association Members, for which ABI Lab acts as coordinator/facilitator. The first concrete application of ABILabChain is Spunta Banca DLT, which applies the technology based on distributed ledger to the reciprocal interbank reconciliation procedure, greatly simplifying and standardising the bank reconciliation process at a national level (Figure 3).

THE USE CASE

The players

Spunta Banca DLT is a private permissioned DLT-based project for interbank reconciliation. In March 2020, the DLT-based system was implemented across the Italian banking sector. The new application streamlines and automates the reconciliation of transactions, improving governance of the overall 'spunta' process, a sort of 'nostro' (our money that is on deposit at your bank) and 'vostro' (your money that is on deposit at our bank) and moves from a slow error prone settlement system to a real-time management of the reconciliation process. A consortium consisting of ABI Lab, SIA, providing the network infrastructure, NTT DATA, handling technical elements such as design and end-to-end support and R3, providing Corda Platform together with 18 Italian banks/banking groups, participated in the development testing phases, delivering an industry-wide transformation. The project activities, coordinated by ABI Lab, involved a community of more than 150 representatives from the pilot banks and more than 80 people from the development team.

THE CHALLENGE

Historically, the reconciliation process for interbank transactions in Italy, known as 'spunta' in Italian, has been notoriously complex. With multiple parties involved, the task of identifying and addressing

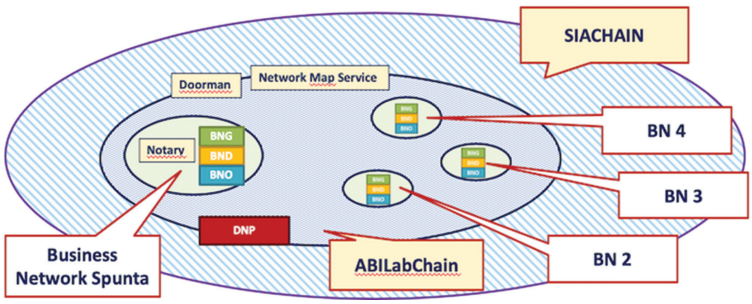

Figure 3: ABILabChain.
Source: ABI Lab

inconsistencies has historically been hampered by a lack of standardisation, the use of piecemeal and fragmented communication methods and no 'single version of the truth'. As a result, resolving mismatches in transactions has been a labour-intensive and time-consuming process. For decades, these shortcomings have meant that the need to reconcile transactions with other banks has been a major headache for financial institutions in Italy and all through Europe. These issues made the 'spunta' process an ideal candidate for automation through Blockchain technology to automatically detect non-matching transactions using a shared algorithm, to standardise both the process and the single communication channel, and to provide a comprehensive view of the transactions among the interested parties.

THE COMMITMENT FROM THE BANKS

The new potential offered by the DLT to drive significant improvements for the banking sector captured the interest of the Italian banks right from the outset. This drove ABI Lab, backed by ABI, to identify a suitable and relatively simple use case to test and prove its effectiveness. The interbank reconciliation process is a niche back office process, which was seen as an excellent candidate to test with this technology. As a result, the new interbank agreement, approved in May 2019, provided that all Italian banks would use Spunta DLT application for the reconciliation process, supporting the switch to a distributed ledger.

THE SOLUTION

The new Spunta DLT application is currently in production, with a total of 98 banks that joined in three waves, the first in March 2020, the second in May 2020 and the third in October 2020. The solution enables banks to pinpoint mismatches in interbank transactions quickly by sharing common data in a secure way, performing checks and exchanges directly within the application and using standardised processes and communications for correcting issues. The smart contract technology solution also provides banks with automated feedback on their transactions. The results include lower operational risk and faster, more transparent processes, all delivered through a highly user-friendly interface.

Between 1 March 2020 and 15 January 2021, Spunta processed 331.761.120 transaction, 221.755.410 movements for 598 reciprocal accounts. The automatic matching rate recorded is 98.2 per cent.

TOP LEARNING OF A CONSORTIUM BLOCKCHAIN DLT

The design and launch of a Blockchain/DLT project require a broad view on aspects that have a huge impact in the planning and the development of the new application.

The important aspects to consider include the following:

- Governance and legal model
- Technical features
- Architecture
- Organisation

GOVERNANCE

Governance is the most important aspect to consider. Distributed technology implies distributed governance, and therefore a clear definition of the roles is a crucial step at the beginning of the process. The nodes are linked to different entities operating on a shared infrastructure, which is a very delicate and complex element.

In Spunta Banca DLT there are six levels of governance. This has been shared together with the 18 banks that have worked together with ABI Lab, ABI and the technical partners since the beginning of the project. The common effort has also helped define the legal and contractual model that governs the

relationship among the entities sharing the infrastructure (Figure 4).

The preparation of the contractual architecture of Spunta required a substantial degree of commitment to coordinate the various actors involved. All players had to try to get out of the classic customer-supplier dynamic, to 'create a system', to understand that the distributed nature of the project would have required a different and more flexible approach, also in negotiation and contracting. The common goal was essential in order to reach a regulated approach. The issues related to the processing of personal data in DLT systems have proved to be particularly difficult, also in the light of the immutability character connected to the technological element, which do not go well with the data retention regulatory principles. The 'flexible' characteristics of the chosen technological solution have significantly facilitated the middle ground between all the parties involved in the process, and a painstaking approach to data protection helped to deliver the final satisfactory result.

TECHNICAL FEATURES

After a PoC phase it is required to closely follow platform evolution and maturity, adapting and sometimes changing the solution to the new features/architecture of the platforms, especially when the final goal is to move in production. In the final planning phase, a crucial aspect is integration with legacy systems; flexibility and responsiveness are needed to manage this delicate transition.

ARCHITECTURE

With respect to the architectural setting, there are recurring challenges, especially in initiatives involving different subjects:

- parallel management of multiple infrastructures configured in different ways (eg multiple nodes managed differently)
- an 'industrialised' and automated deployment
- an architectural separation of the software of the nodes that guarantee separate environments, with the possibility of hosting different nodes on the same applications.

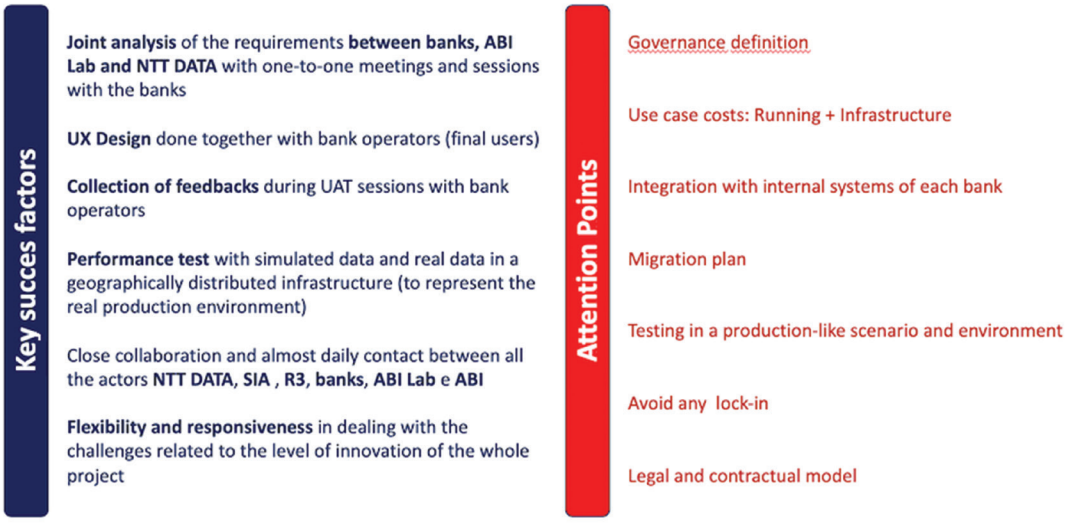

Figure 4: Important points on the design and launch of Spunta Banca DLT.
Source: ABI Lab.

ORGANISATION

On the organisational front there are several aspects to consider, especially if the initiative involves multiple subjects: a clear definition of all relationships between the actors involved in the value chain, continuous and periodic alignments between the participants and strong info-sharing. Furthermore, the involvement of the legal departments from the early stages of design is paramount.

CONCLUSIONS

With the Spunta Banca DLT project, ABI Lab has effectively allowed the entire Italian banking sector to migrate to a permissioned DLT, with the potential of the new infrastructure and set-up to be used for further business processes in each bank. This is the first time that something like this has happened both nationwide and worldwide.

Spunta Banca DLT could, therefore, be the forerunner of a series of further projects in the banking and financial sector in Italy and Europe. The next step would thus be to build a European level working table to draw the requirements together, mirroring the consultative, collaborative approach that has proven so successful in Italy.

Credits

We would like to thank our technical partner R3 for their support in drafting this paper, sharing their document: *R3 Case Study: Fast and Transparent Interbank Reconciliation Powered by Distributed Ledger Technology*.[6] We also extend our gratitude to Ms Ildegarda Ferraro, Head of Media Relations at ABI for her valuable input by sharing her collection of interviews, *Le voci di Spunta (Spunta Voices)* with the key players in the Spunta Banca DLT project.

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