A Future of Finance Round Table

Interoperating token networks: What they are and how to get there

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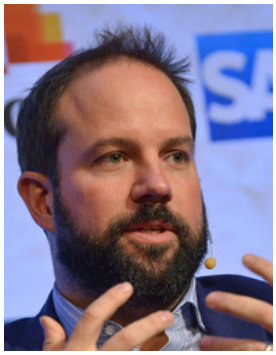
Future of Finance

The tokenised future of the capital markets is finally taking a definitive shape. The end-state is an inter-operating network of networks in which digital assets and digital cash share a common operating model that makes them inter-operable by design at every stage: issuance, trading, settlement, custody and asset servicing. In June 2023, R3 and Adhara published a paper, *Building Scale for the Connected Digital Capital Markets Ecosystem*, that describes this future, the benefits it will generate for both the sell-side and the buy-side and – most importantly - how the capital markets can get there. Dominic Hobson, Co-founder of Future of Finance, hosted a discussion with the authors and representatives of four banks which share their vision.

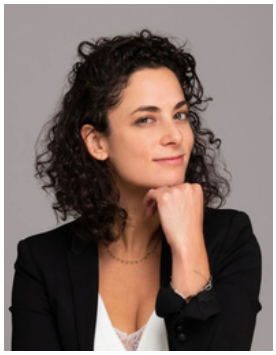
Orla Aherne

Director, Digital Asset Custody, BNY Mellon



Ed Budd

Co-founder, Adhara (author)



Robyn Friedman

Head of Blockchain, Digital Wholesale Office, Nomura

Julien Clausse

Head of Asset Foundry (Tokenization & Digital Assets Platform), BNP Paribas CIB

Marianne Webber

Head, Digital Asset Market & Regulatory Strategy, Standard Chartered Bank

Gonçalo Lima

Capital Markets Ecosystem Lead, R3 (author)

David Vatchev

Global Head of ISV Sales & Ventures, R3

Dominic Hobson

Co-founder, Future of Finance

Future of Finance: There is no shortage of individual blockchain and tokenisation projects in repo, swaps, payments and securities. Why have they yet to achieve scale?

Lima: The reason experiments are failing to scale is because we are pursuing siloed initiatives that work in isolation but are not integrated with each other. Within the R3 eco-system alone we have for example HQLAx digitising collateral, Finteum doing intraday FX swaps and SSImple digitising Standing Settlement Instructions (SSIs). In other networks such as Hyperledger Besu, Fnality is digitising cash. There are lots of good initiatives across different regulated networks. For these initiatives to create the network effects and compounding benefits, these need to brought together be truly interoperable. That is why we wrote and published a paper that explains how these pockets of initiatives can be made interoperable across the end-to-end workflow in Financial Markets.

Future of Finance: Network effects, and the growth opportunities they create, will take time to emerge. What are the short-term incentives for financial institutions to support interoperability between networks – is it immediate revenue growth or immediate cost savings?

Friedman: If the benefit is marginal, and the risks are high, and it means an additional system to manage, it is hard to make the case for the investment. With an instantly monetizable use-case it is much easier to pitch the business case and start the conversation internally, because it is less about adopting a new technology and more about streamlining existing operations.

Building Scale for the Connected Digital Capital Markets Ecosystem: A Summary

Tokenisation has the potential to transform the capital markets at every level: issuance, trading, settlement, custody and asset servicing. However, tokenisation initiatives have so far failed to attain sufficient scale and liquidity to transform the status quo. This is because they are confined to closed groups operating in isolation from each other.

These isolated projects have improved understanding and yielded some benefits but generated insufficient value to make a compelling business case for banks and asset managers to transfer business to the networks they have founded. The way to achieve compelling value is to build scale by making isolated projects in issuance, trading, settlement and custody "inter-operable".

By adding scale, inter-operability delivers increased liquidity. Increased liquidity in turn delivers value to banks through capital savings (by increasing the volume of High-Quality Liquid Assets (HQLAs) and widening the availability of central bank money for settlement) and cash savings (through reduced fragmentation of settlement cash buffers across multiple markets).

R3 has created a "roadmap" of steps banks and financial market infrastructures (FMIs) can take to achieve inter-operability between currently isolated projects. The steps focus on achieving liquidity through a series of limited but profitable projects that gradually extend the range of inter-operable digital assets and digital cash until a truly global digital capital markets ecosystem is achieved.

Future of Finance: Tactical gains do not necessarily add up to a strategy. How can small wins in limited areas contribute to the long-term transformation of the capital markets?

Friedman: Right now, in banks, competing for resources - competing for the ability to actually do anything at all - is difficult. We are working in very different circumstances to even two years ago, when we were toying with public blockchain networks and tokenising every imaginable class of asset. Nowadays it is about the impact on the bottom line. The question is, `Are you bringing something that can actually make a positive change to the bottom line?'.

Future of Finance: But there are two opportunities available to get that first "win" in intra-day liquidity already – namely, HQLA on the collateral side and Fnality on the cash side. If transformation starts with intra-day liquidity, why are banks not using HQLAX and Fnality already?

Friedman: People just don't understand the possibilities at this point. It is a step-by-step process. In each bank, you have got to identify small use-cases relevant to that bank to be able to draw the picture for that bank of how this technology solves something for that bank.

Future of Finance: Who does that communication strategy need to reach – is it the senior management of the banks or individuals further down the hierarchy?

Aherne: We experience the opposite of that. The interest to invest in digital technologies is actually coming from our senior leadership at the bank, who are saying these new technologies - be they tokenization, be they AI - are something that we're investing in now to lay the foundations for digital capabilities in the future. That really does permeate through the entire organization. We serve buy-side, sell-side, issuers, investors - we literally serve every part of the financial markets. And everywhere we see clients asking about digital-driven services. So I would say there has been a big shift in attitudes in our bank over the past few years, and definitely under the stewardship of our CEO Robin Vince. Thinking digitally now is, and has to be, in the DNA of every single line of business. That is, I know, in total contrast to what Anthony is saying.

Clausse: We hear a lot of talk about having a simplified communication in order to simplify Blockchain complexity to the decision makers to help them understand its benefits and business impact. This means one must understand the technology to understand the impact on the business processes and the value proposition of technology to businesses. You must educate, ideally with very concrete and hands-on experimentations, as well as explain, at the highest level possible. However, do not oversimplify.

Friedman: Actually, I love the fact that the paper keeps it simple. When we had to turn our focus inwards, into the bank, we had to start talking in a language that senior management could digest. It was a difficult process. We had to represent the potential benefits of digital cash and digital assets, and the supporting infrastructure, stripped of all the complexity. Simply is exactly how we now approach it.

Webber: I agree completely. The paper is one of the best articulations I have seen of what the end-state vision should be. I am relatively new to the digital asset space myself, so it is sometimes hard for me to articulate to management what really is the end-goal. The paper does a fantastic job of that.

Budd: We used very simple terminology deliberately. Most pictures of a future state are vendor-specific, or platform-specific or technology-specific, which makes it difficult to understand them, assess them in terms of maturity or compare them with other initiatives. By leaving out the contributing technologies, and the vendors and market participants involved, we were able to develop a common, abstract way of talking about the subject. That enabled us to identify the pain points that need investment to fix.

Friedman: Anthony is right. Financial markets as they exist today do work. They may rely on layers of legacy systems, but they do work. The risk is managed. Business gets done. I could promise to tokenise amazing new asset classes but we are not there yet. To be able instead to bring to senior management, in simple language about cash and securities, a valid, monetizable use-case that will have a positive impact on treasury and operations within six to 12 months is a lot more interesting to them.

Future of Finance: But even the interesting use-case of intra-day liquidity, while it dispenses with the complexities of cryptocurrencies and DeFi, does still depend on the integration of digital assets and digital cash. How distant is the possibility of paying for digital assets with digital cash or using digital assets to raise digital cash – and vice-versa?

Friedman: It can seem quite far away. There is an almost complete dissonance between the world of native tokens settling on public blockchains and the current technologies that promise only to make the delivery of traditional securities against traditional cash more efficient.

Webber: In the paper, the digital cash component seems to reference heavily central bank digital currencies (CBDCs). It might be helpful for us to be thinking about Stablecoins and tokenised deposits as well. Otherwise, we are slightly at the behest of central banks and there is a risk that innovation will move at the pace of the central banks.

Lima: The paper asks how we can bring the assets and the cash together, because a lot of initiatives have tokenised assets successfully, but market participants still need to pay for them with something digital if we are to achieve delivery versus payment (DvP). The cash leg is critical and the paper shows how it can be brought to the ledger.

Aherne: The paper certainly makes it easy for anybody who is familiar with TradFi concepts such as primary market, secondary market, pre-trade, trade and post-trade to see that this is applicable to them. I also agree that we will only see traction on this when we can bring the digital asset side together with the digital cash side.

Future of Finance: Regulatory uncertainty on the status of cryptocurrencies is reminder that integration will take more than digitisation of money, and must extend to the digitalisation of operational processes and alignment of laws and regulations as well. How is that progressing?

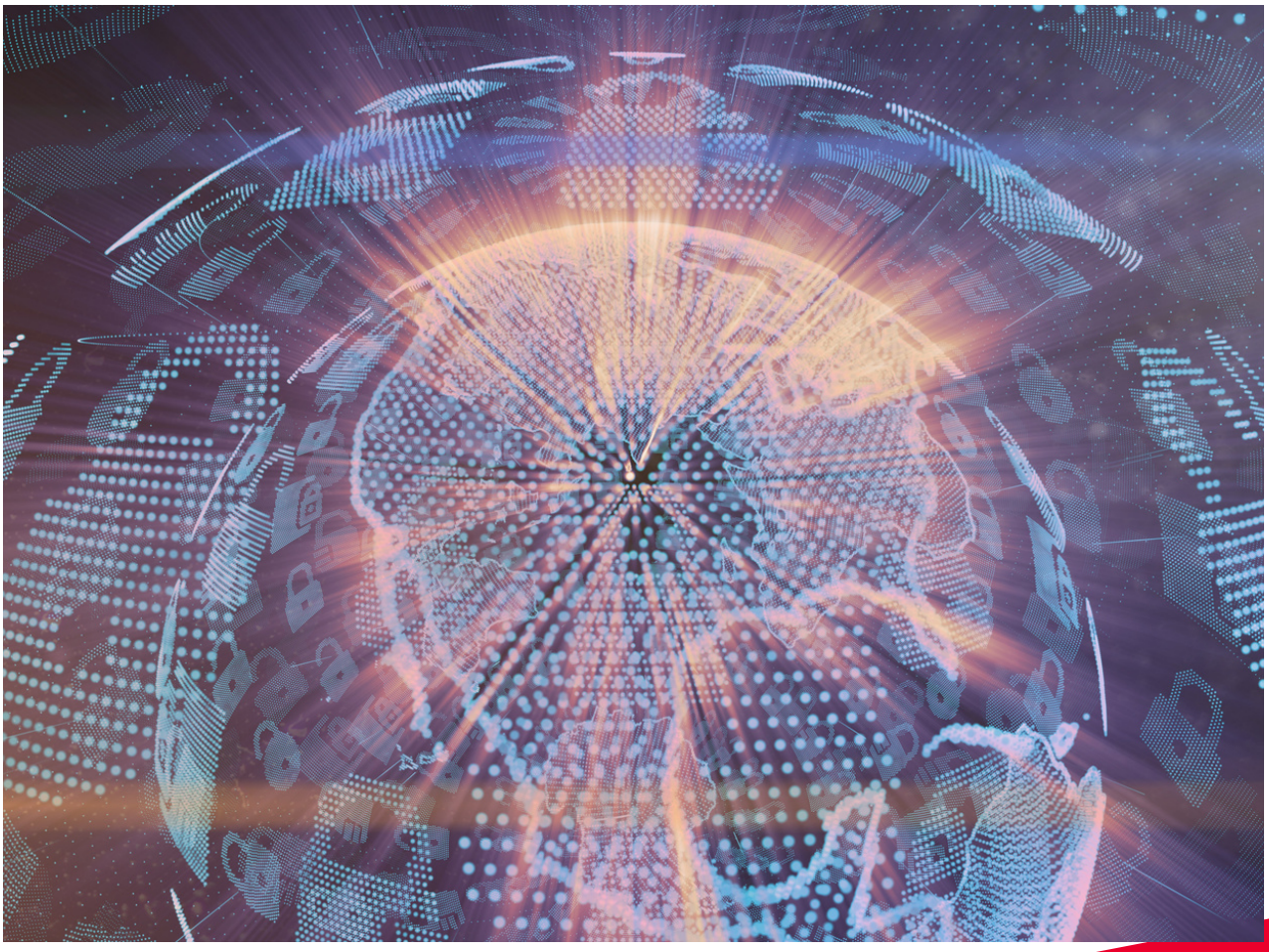
Clausse: Digitalisation of processes comes before tokenisation of assets, so we have to work on digitalisation. Obviously, digitalisation serves tokenisation because it structures data making it readily available for being wrapped in a token, but they are not the same thing. Digitalisation is about preparing assets, ideally in standardizing as much as possible their processing – all by remaining nicely connected to legacy systems. We know there may be a transition phase between the traditional systems and the integration of tokenised systems. Such a transition would require to change the business processes more than changing the technology. Organisations have to work out how to try to connect to networks and send and receive asset-backed and native tokens. That means reviewing and possibly rewiring business processes. It means understanding and mitigating new legal liabilities, especially if you leverage public blockchains. Safe custody, data privacy and cyber-security all have to be re-thought. In some ways, compliance is the easiest challenge, because you can simply white-list qualified institutional buyers, counterparties and custodians. But the change is certainly not about the technology only, that is for sure.

Aherne: There are a lot of additional complexities out there that this paper does not capture, including the legal considerations. The technology piece can actually be quite easy. The difficult pieces are engaging the market participants to get the network effects; the legal and regulatory challenges; the risk and compliance aspects; and the technical and operational difficulties of enabling traditional finance systems to work with digital asset networks. These are things we must factor in as well. It sounds easy and aspirational to just flick a switch and be able to bring all these chains together, but we have not yet arrived at a clear legal definition of settlement finality in digital cash or assets, regardless of our ability to achieve interoperability between specific platforms and networks. Any solution to the interoperability problem has got to solve for settlement finality, and how settlement failures will be handled. I agree with the high-level strategy but there are a lot of deeply complex details that we must solve for along the way.

Clausse: It's important to work with lawyers if you are going to engage in tokenisation activities. Tokenization is about "ecosystems" – not only "technology" – and when talking "ecosystems" that includes regulatory landscapes as well as business interactions, from liabilities to deliverables: all that needs to be carefully scoped from a legal standpoint.

Future of Finance: It is clear that the public sector could do more to encourage change. Should it do more?

Webber: Public sector collaboration is crucial to progress things, especially when you need such a wide range of stakeholders and different parts of the eco-system to come together. Inevitably, that role of bringing disparate groups together can be played only by a public sector entity. It can be difficult to have these kinds of conversations in the absence of that. Project Guardian in Singapore, for example, which we have been involved with, is a great example of a regulator – the Monetary Authority of Singapore (MAS) - taking a lead and driving tangible progress.



Future of Finance: Can network effects be accelerated by making it easier to participate by working with established networks, such as SWIFT and FIX, that market participants are using already?

Clausse: A strategy of piggybacking on existing networks makes sense. For the sell-side, it is a good segue into the future. But eventually it is all about the buy-side.

Lima: The buy-side want access to more asset classes and want transactions to settle correctly and fast, so that they can redeploy their capital somewhere else that yields better returns. Integration to existing systems is as critical as interoperability as most financial institutions are unable to replace all their traditional systems at once. Therefore, as a group we could potentially work with existing infrastructures and message standards to make integration easier for hundreds of sell - as well as buy-side firms, so that these new networks can scale quickly without creating undue cost and risk.

Clausse: You are right that the buy-side do not care if an asset is a token. What they care about is access to possibly currently unreachable asset classes and transparency of data. But they will see their custodian bank as a potential the point of access to these optional networks. The buy-side relies on custodians. They will say to their custodian `Take care of all these tokens and protocols. Take care of financial crime compliance and data privacy and cyber-security.' We know a very few buy-side firms that may try self-custody, but most just want the operational side to cost them less time and money. If we provide them with something that is simple and easy and consolidates the data, they will engage.

Future of Finance: SWIFT and FIX also issue standardised message types to facilitate automated data exchanges. Could established messaging protocols be adapted to carry, say, ERC 20 data between participants on different digital asset platforms?

Clausse: Yes. BNP Paribas participated in SWIFT experimentations with Chainlink, using a combination of Chainlink connectivity and existing SWIFT infrastructure to transfer value between a range of public and private blockchain networks.

Budd: Even if you standardise a data exchange, you do not necessarily solve all the integration challenges. We have worked to ensure that the tokens representing assets on HQLAx and Fnality are compatible, but our work covers only a small part of the spectrum. When we work with other initiatives, we find they represent the same things in different ways. We need to make sure that there is an open way to record and resolve these differences.

Clausse: It is even more complex than that. To me three "stars" need to be aligned: the network, the standard and the data. I can give you a concrete example. Let's say, one bank issues a tokenised bond on the Ethereum as an ERC 20 standard, and another one does the same. Despite being issued on the same network with the same standard, they are unlikely to be compatible as the data structure in the token will be different. If you consider tokens as the "super APIs" of tomorrow, you have to think of those as the "touchpoint" for the whole ecosystem connected to that network – having a common language will be key.

Future of Finance: If two sell-side firms are experimenting on the same blockchain protocol in isolation from each other, it suggests silos exist even in areas of overlap. So how do you engage the sell-side in a collaborative venture and vision of the kind outlined in the paper?

Lima: You mention volume. We have learned that you can make a commercially viable case if you have your top three counterparties involved. There was a bit of an `Aha!' moment when we realised that any network does not need 200 participants. If a bank has its top three counterparties on HQLAx, for example, that in itself brings value to the participants.

Clausse: I am not sure it is about volume. It is more about network participants. You can have one bank and if that bank is on a private network, and they operate on that private network only, they will have a lot of volume – and there will be great benefits linked to digitalisation which could bring efficiency to that bank. But if you want to reap the benefits of network effects, you need to make it easy for new participants to get in. If it is complicated, and they must sign multiple contractual agreements, they are less likely to join. Network effects are more important than volume to truly reap the benefits of tokenization.

Future of Finance: How large a constraint on sell-side engagement is lack of budget?

Clausse: Capital markets today are fairly efficient. Potential change of the infrastructure of the markets is a huge investment. So, such a change would require that the benefit have to be 10x. Whatever use-case is brought to the table, it has got to have 10x benefit, not 10%.

Friedman: Solutions such as these are not true native blockchain solutions, as they are simply reflecting from a books and ledger perspective of asset positions, but they are perfect for where the banks are now. It is not the end-goal, or the end-state, or anything visionary. However, at the same time, it does solve a real problem by allowing real-time atomic transfers without forcing the banks to abandon their traditional, legacy systems.

Future of Finance: If the clinching argument is that the clients want the change, how can the buy-side best be engaged?

Clausse: Indeed, it is all about the buy-side. Obviously, you need to provide benefits to the sell-side as well, but those benefits include making it easier for them to sell to the buy-side. For the buy-side, the custodians will be the entry point, and they will connect through the custodians to those networks where there is enough liquidity. Making those liquid networks accessible to the buy-side, and inter-operable, is going to be key.

Lima: In a few cases, buy-side outsources back-office operations to custodians. The problem for some solutions to scale is that in some cases they expect the custodians to solve the problems they face with investing in digital assets. With a few exceptions, Buy-side can be reluctant to invest in the technology because they expect the sell-side to provide them with a scalable plug and play solution. So although prominent asset managers such as Larry Fink, the Chairman and CEO of BlackRock, say that the future of asset management is tokenisation, for several others their willingness to invest in tokenisation is largely confined to increasing the distribution of their funds or gaining access to more asset classes. Although the technology could enable them to insource some of the back-office functions they have outsourced, by harmonising post-trade processes across all the instruments in which they invest, but this is not how the majority are thinking.

Aherne: At BNY Mellon, every single line of business is inundated by buy-side clients seeking to use their trusted custodian to do everything the proper way in terms of client segregation and asset safety rules and regulatory reporting. The buy side is busy, like the investment banks are, trying to improve rates of return. They do not want to be minding private keys or making sure electronic signatures are valid. They want to leave that work to their trusted custodians.

Friedman: How exactly will the buy-side benefit from this technology?

Lima: The answer is that what the buy-side sells to its customers is risk-adjusted rates of return. The current ecosystem erodes those returns because it creates a lot of costs throughout the value chain. If that chain is more compressed and more frictionless, the rate of return achieved by the buy-side will be higher and the associated risks will be lower. Whether these efficiencies will be passed to customers is a commercial discussion.

Future of Finance: What are the most important drivers for both sell- and buy-side firms to embark on the journey to the end-state outlined in the paper?

Aherne: The risk of being left behind in a marketplace whose evolution is driven heavily by changing client demands. Every company innovates these days to keep up with their clients, or they will not survive.

Clausse: There is a risk of disintermediation, yes, but not because of blockchain technology. The technology does not eliminate the need for intermediaries to structure and validate the data to be written on to the distributed ledger. The real question about disintermediation is: will the entities that write the data to the ledger in the future be the banks of today or will it be new entrants that have entered the space? I do not know and tokenization still has to prove market acceptance.

Friedman: The understanding that comes from education. It is putting the future on paper, breaking it down, taking the use-case and saying, `This is what the use case is. This is where it touches your existing business. This is how to approach it. This is the problem we are solving.' I understood it intuitively from the beginning, but the paper helped me to start articulating it within the bank.

Key Points From the Discussion

- Isolated digital asset initiatives will be difficult to scale without the interoperability that brings assets and counterparties together across multiple networks
- To initiate progress towards the end-state vision of inter-operating networks, it is best to start with a project such as addressing the cost of intra-day liquidity, which delivers immediate returns to banks
- Views differ on which tier in the management hierarchy of banks will benefit most from education and communication about the opportunities created by interoperable networks
- Similarly limited projects to intra-day liquidity, which also deliver measurable benefits, will become beacons that ease adoption by banks of projects in other areas
- Over time, a series of compelling use-cases will likely evolve progressively into an overall strategy that realises the end-state vision of interoperating networks
- The capability to create digital assets through tokenisation is well-established but the digital cash needed to settle transactions Delivery versus Payment (DvP) remains elusive: Fnality Payment System offers this currently missing capability
- The transition from the capital markets of today to inter-operating networks will evolve over time, and raises legal, regulatory and processing as well as technology challenges
- Governments, central banks and regulators vary in their willingness to encourage and co-ordinate progress but in their absence, private sector collaboration can be effective
- Network effects can be encouraged by working with established networks such as SWIFT and FIX, by relieving market participants of the immediate need to invest in e.g. new interfaces
- Buy-side institutions may look to their custodian banks to insulate them from the operational costs and risks of investing in digital assets
- Interoperability benefits from the standardisation of data exchanges but incompatibilities between even ERC 20 tokens issued on to Ethereum suggest further progress is required
- Competition for resources is a significant constraint on ambitious, long-dated projects but there is an opportunity for limited projects which deliver immediate returns in the form of cost savings
- Engaging the buy-side with digital assets and digital cash is essential to the long-term success of interoperating networks, so making them accessible to buy-side firms is crucial
- Buy-side firms are interested in digital assets and digital cash to boost risk-adjusted returns, and are increasingly demanding their service providers to support digital investment activities
- Rising costs, and the threat of losing business or even disintermediation, argue for both sell- and buy-side firms to engage in the development of interoperating networks
- It is easier and cheaper, especially for custodians and third parties, to integrate existing systems with blockchain networks that are already in production
- Clear timelines and milestones to commercialisation and profitability limit the risk of stagnation and inaction by giving customers and vendors a clear path to profitability

For more information and to receive the analytics please contact

Wendy Gallagher
Co-Founder and Commercial Director

Email: wendy.gallagher@futureoffinance.biz
Mobile: (44) 7725 160903