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DLT in The Real World 2024

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A practical perspective on where, why and how distributed ledger technology is changing our capital markets in 2024.

An **ISSA report**, supported by **the ValueExchange** and sponsored by **Accenture, Broadridge** and **Ripple**.

Contents

ISSA Introduction

The ISSA DLT Working Group has been at the forefront of the digital asset journey to help the Securities Services industry understand the latest trends, the evolution to expect in the future and to make sense of the practical considerations and challenges. ISSA's aim is to shine a forward looking light on DLT through our thought leadership.

With this spirit, we partnered with the ValueExchange five years ago to create an industry survey to track the real-world evolution of DLT and digital assets from a market perspective. We are very excited to therefore be publishing the fifth of the 'DLT In the Real-World Longitudinal Study' series. The results here drive the DLT discussion in the Securities Services industry. This exciting new report brings even deeper insights than before and participation beyond the traditional banks and infrastructures in our industry.

Colin Parry, ISSA's CEO, was at the PostTrade 360 conference in Stockholm in September where he had the pleasure of moderating a panel. To paraphrase one of the panellists **"DLT is operating at scale in the financial markets now. I fail to understand why people do not think this is true. As with every technology, success happens by finding the right business case and deploying the right functionality. Look and you can see these cases on a daily basis."**

The panel's frustration came through in the discussion, but as well as triumphs there are challenges and this report shows both. There are a number of paths forward that the industry can take - across a number of asset classes - and the paths may have bumps and wrong turns, but value is already being extracted.

This is why ISSA has issued the **DLT – Project Success paper**. The aim is to help organizations understand the differences between DLT and classic Securities Services projects and ensure that the future deliveries have a greater chance to be successful.

We would like to thank the huge number of people and firms who participated in this report and provided their valuable input as well as our 2024 survey sponsors - Accenture, Broadridge and Ripple. We hope this report will not only be insightful to you but also help you benchmark your organization's DLT and digital asset journey compared to the industry's trajectory. As we continue to move forward the Working Group's agenda, we look forward to working with you to use the insights from this report to drive further thought leadership and industry engagement via the new **ISSA Evolving Technologies in Securities Services** working group.

ISSA DLT Working Group co-Chairs

Glen Fernandes

Steve Everett

Explore the ISSA DLT Project Success paper here

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In a year when the importance of DLT and digital assets has risen to new heights, 2024 has been a massive year in the evolution journey of this new technology. If 2023 was the year of stabilisation (after the challenges of 2022), this year must be characterized as the year that DLT has gone 'deeper, not wider'.

Whilst the volume of press releases and proof of concepts has declined, many of the key, business metrics of DLT have improved significantly over the last twelve months.

We have seen a record year for native, institutional digital asset issuance with over USD 4 billion issued in the last year - bringing the total to more than USD 16 billion so far.

We have seen over USD 4 trillion in monthly, transactional liquidity across key tokenisation platforms and over USD 800 million in subscriptions to tokenised funds.

Regulators have helped to move the market forward not only through new guidelines (such as the BIS' SC060, providing valuable clarity around how to distinguish the treatment of tokenised assets from crypto-assets) but they have provided a bedrock of experimentation and development on which markets are now building (such as the ECB DLT trials, the Global Layer 1 initiative, the HKMA's Project Evergreen, Brazil's Digital Real, the Swiss National Bank's Project Helvetia, etc.).

New forms of digital cash (and payments) have entered the mainstream, providing an essential funding leg to match every digital security transaction and enable truly seamless delivery-versus-payment.

And most importantly, the levels of business cooperation between providers has never been greater. Firms are spending real resources now to connect disparate and isolated pools of digital liquidity, building a coherent, global digital asset ecosystem one step at a time - particularly in the areas of collateral, fund distribution and private markets.

As this year's research highlights, we must not fall into the trap of thinking that this progress brings us within only a few years of a tipping point. In an era of total focus on business benefit, DLT and digital assets are now 'paying their way' and delivering a growing range of P&L improvements to firms across the capital markets space.

We are extremely grateful to the 354 teams and departments that have made this year's fifth, annual "DLT in the Real World" survey a success. Our ability to chart the continuing evolution of this technology relies entirely on the insights and perspectives shared by industry leaders. We strongly recognise the generous commitment that digital specialists across the world have made in contributing to this report.

We sincerely hope that this report (and the data that supports it) can play a valuable role in your own case for digital transformation - and please do reach out if ever you would like to dig further into any of the findings in this report.

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Reach out and carry on the conversation here

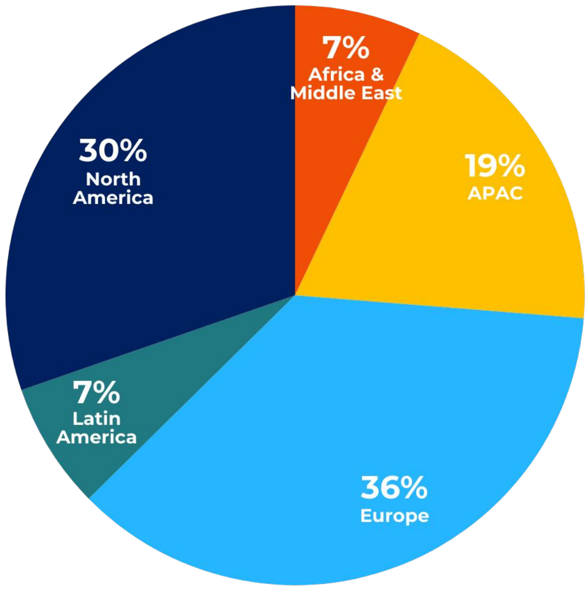
Who participated?

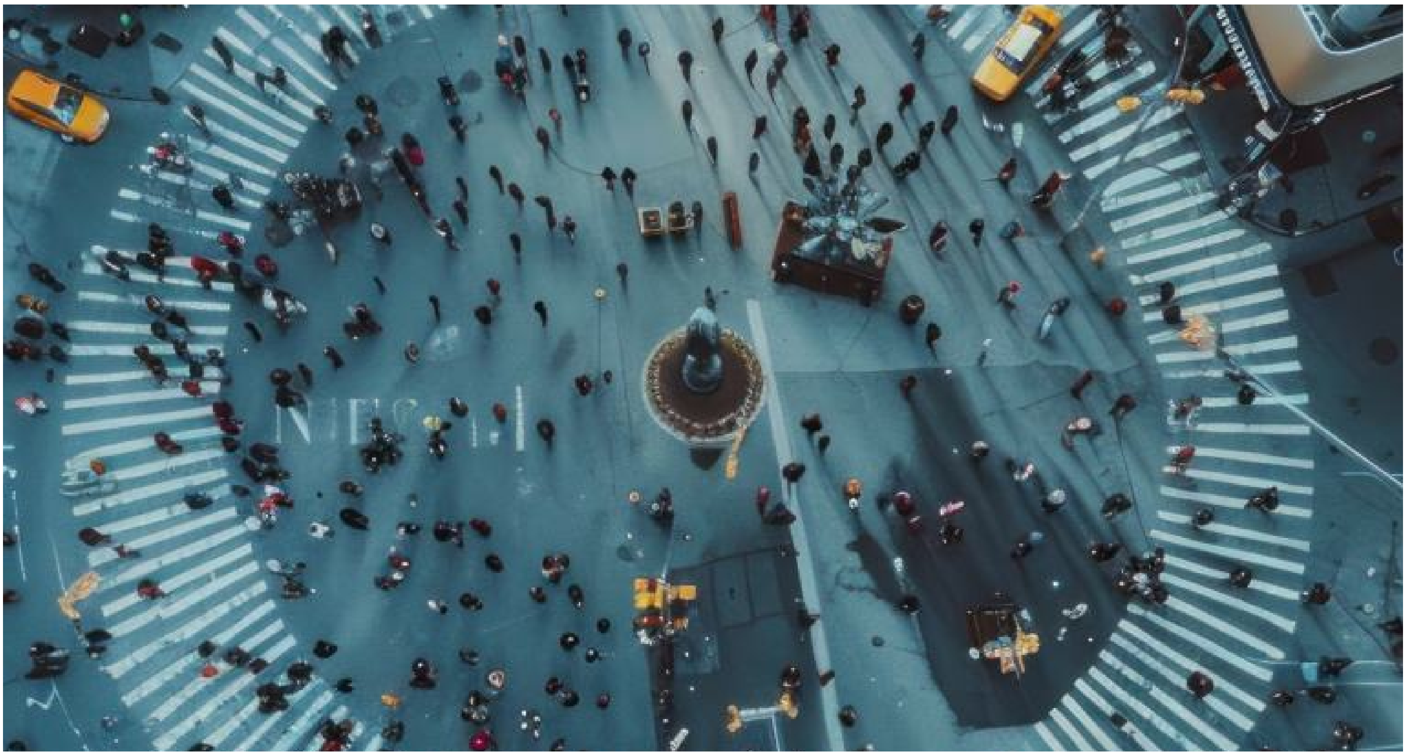
For the fifth consecutive year, we are privileged to present the ‘state of the state’ on Distributed Ledger Technology and digital assets. Conducted with ISSA, this research not only represents the state of the digital ecosystem today but also allows for comparison to prior years and a look into the future. The data illuminates trends and shifts in priorities in real time, even as markets transform.

This year’s data set is similar to 2023 both in scope and distribution across roles and geographies - so what did respondents tell us in 2024, and what are the surprises from last year?

2024 PARTICIPANTS BY SEGMENT

2024 PARTICIPANTS BY REGION





DLT in the Real World 2024

The headlines

Where are we on the journey? accelerate growth?

DLT has never been more important: FMIs and wealth managers see it as at least 10% more important than 2023.

Deeper, not wider: We are not running more new projects in 2024 – with a stable level of live deployments at 37%.

All issuance, little turnover: Despite over USD 15 billion in digital issuance, 47% of initiatives have less than USD 1 million annual turnover.

A digital fixed income trade cycle is forming: With over USD 1 billion across issuance, trading and financing.

Regional variance is significant: And is strongly linked to local regulatory developments.

We're not where we expected to be: xpectations are around two years ahead of reality.

Why and where is digital liquidity forming?

66% of our initiatives are now driven by cost, revenue and treasury benefits, replacing learning as our core drivers

80% of investors see DLT as an enabler for distribution

Bonds are emerging as the central asset class

58% of our projects are tokenisation in 2024: As native issuance becomes less core

3 core ecosystems are emerging: With physical assets and private markets growing fast

Money market funds are seeing a 13% increase in activity

How can we accelerate growth?

75% now struggle with DLT and digital assets, mainly because we're using it differently

Addressing **ROI, liquidity and regulatory clarity** would help 75% of the sell side

Legal clarity is the #1 reason preventing investors from holding digital assets

86% of core business users don't see the value in DLT

65% are moving to private chains: But are we opting for safety over scale?

81% are working on interoperability: Mainly at the application layer

55% are pressing ahead with non: CBDC cash legs today

Benchmark your own DLT plans here

How do your DLT project plans and roadmaps compare with those of your peers? Make sure you use this unique opportunity to benchmark your work with over 350 other specialists today.

Thanks to the extensive reach of our industry survey, we can provide you with detailed, personalised analytics in your own benchmarking scorecard - as soon as you have completed the online survey.
Click below to begin and we will send you your scorecard straight away.

Benchmark your own DLT plans here →

DLT and digital assets

Where are we in the journey?

1. DLT and digital assets have never been more important.

In the fifth year of our DLT in the Real World survey, DLT and digital assets have never been more strategically important.

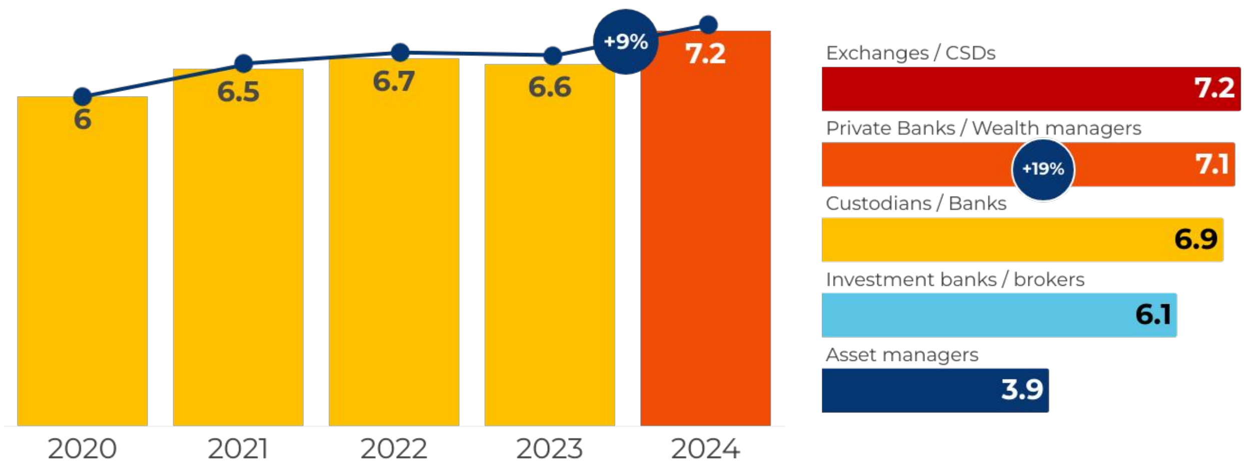
Across all market participants, **this year saw the sharpest rise yet in the strategic importance of DLT and digital assets.** The 9% YOY jump follows a small downturn in 2023, reflecting a post-FTX mindset and a greater focus today on the commercial application of DLT and digital assets, as we move past the era of experimentation.

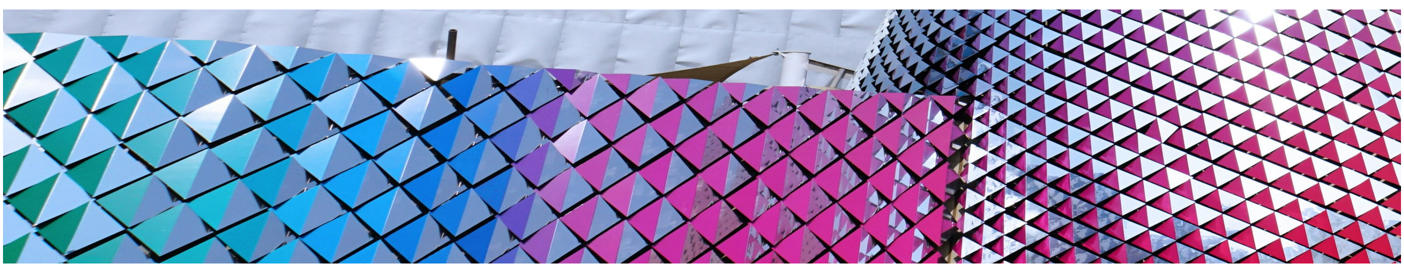
Not surprisingly, the **Exchanges and CSDs who were early adopters continue to lead the way in recognising the digital opportunity.** Given their role at the heart of the institutional ecosystem, financial market infrastructures (FMIs) look increasingly well positioned to deliver the benefits of DLT and digital assets to banks, brokers and regulated firms, in a way that is safe, standardised and resilient. With banks, brokers and investors increasingly looking to revert to their core specialisms (of managing product issuance and risk – but not market infrastructure), the opportunity and pull for FMIs to act as "bridges" between traditional and digital liquidity pools seems to be increasingly compelling. Digital efficiencies, yes. Decentralisation, no.

Our data also evidences **strongly higher interest from private banks and wealth managers in 2024.** After experiencing the rapid growth of crypto and related opportunities for fractional investing, they now see the potential for rapid improvements in historically manual, fragmented and opaque markets such as private and physical assets. As the wealth space shifts from crypto to tokenisation, DLT is clearly an opportunity to leapfrog older technologies and create more liquid, accessible markets to meet unprecedented investor interest.

Strategic importance of DLT and digital assets today

(average out of 10, where 10 is highly strategic)





2. Fewer DLT projects, but more live initiatives than ever.

Since 2022 there have been two, parallel narratives playing out in the world of DLT and digital assets. On the one hand, new announcements continue to highlight the significant growth in digital asset issuance and adoption across the capital markets. Other the other hand, many perceive the DLT and digital opportunity to have passed its peak following the "crypto winter".

In 2024, it appears that both are true.

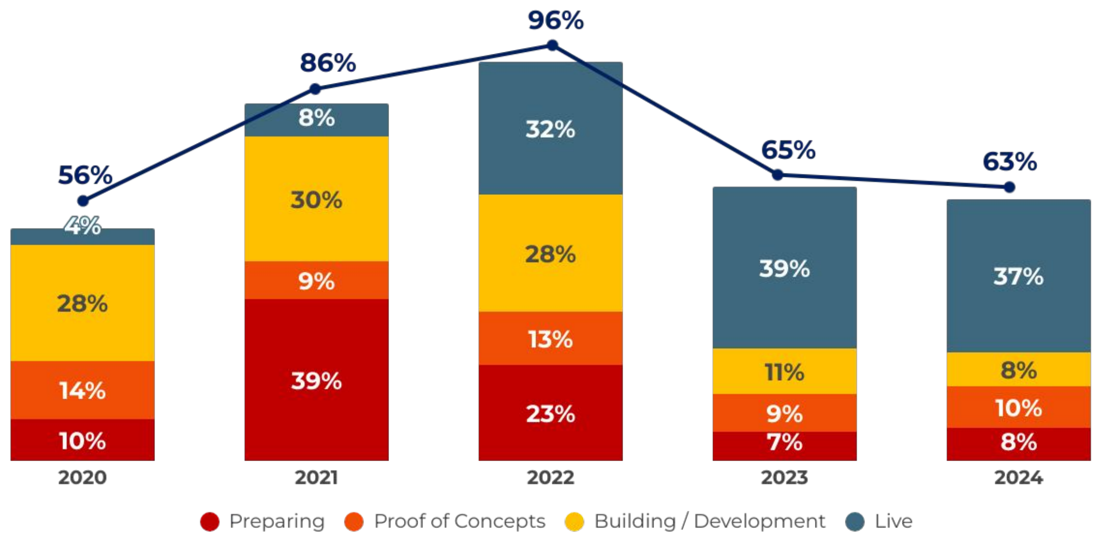
We've never had more live usage of DLT than we do now. With 37% of respondents now "live" with DLT and digital assets across the capital markets, **we have reached a stable (and critical) mass of organisations that are now busily commercialising the digital opportunity.**

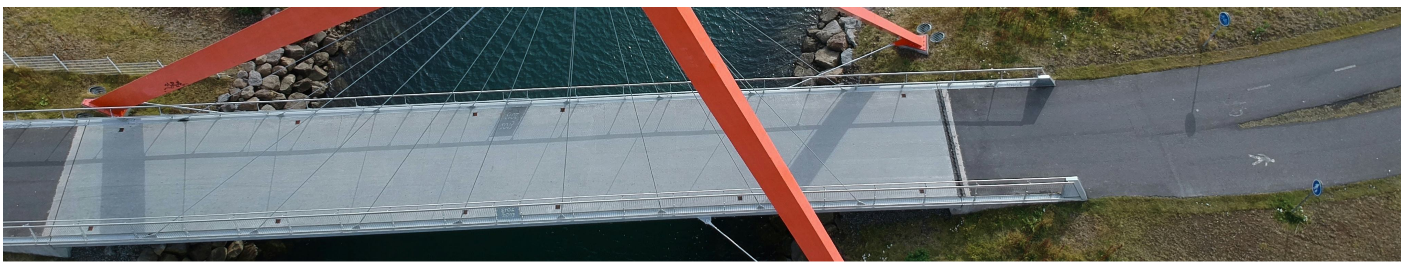
Equally, we have never had fewer firms working on DLT and digital assets. Since the "hype-peak" in 2021, **levels of DLT experimentation and proof-of-concepts (POCs) have continued to decline every year,** to the point where only 10% of firms are working on POCs today and only 8% are in build-phase.

The industry is no longer going wider in its DLT and digital asset activity. Whilst many of the explorers of 2021 and 2022 have successfully launched their solutions in 2023 or 2024, few new firms or digital initiatives appear to be launching entirely new propositions. Instead, the industry's next phase appears to be one of deepening: those who are live are looking to expand their propositions; and those who are not live will remain largely on the sidelines for now.

It's time to shift how we measure market growth and focus on depth rather than breadth. As the market matures, the type, scale and impact of initiatives in the market are a better indicator of progress than simply counting the number of projects in flight.

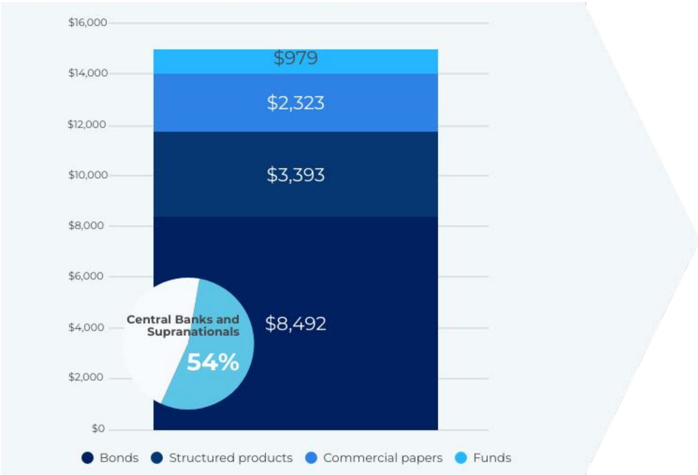
% of respondents working on DLT and digital asset projects
(and YoY change)





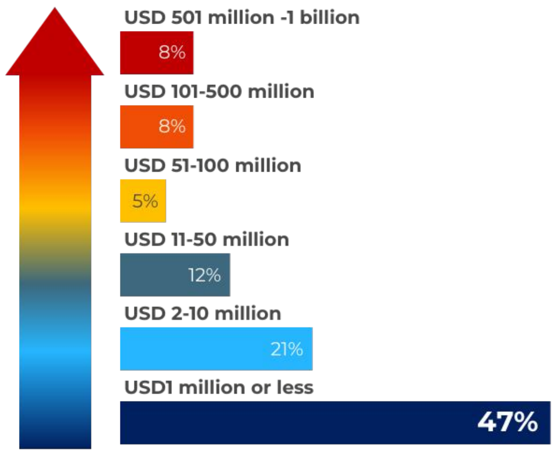
3. USD16 billion of issuance: But no transactions.

Digital Asset Issuance to date
(excluding tokenisation, USD million)



Issuance

Average digital liquidity today
(annual turnover, per participant)



Turnover

If 2024 is characterised by the shift from 'wider to deeper', it is also defined as **the year when industry focus moved from issuance to (transactional) liquidity.**

To date, we've seen more than USD 15 billion in natively digital assets issued, largely in the last five years. Since 2018, **we have successfully demonstrated that we can issue all forms of digital debt and structured products,** to the point where new issues of digital securities attract relatively little attention. Thanks in large part to the active leadership of the world's central banks and supra-nationals (who have together issued 54% of all digital bonds), we know what is possible, we know the benefits of DLT in the issuance phase and we know what is expected of us as market participants in supporting these issuances.

But if issuance is now moving into business-as-usual mode, **transactional activity is still only just beginning.** With more than two-thirds of initiatives generating less than USD 10 million in annual turnover, most of the digital assets issued to date are going into digital wallets and sitting there. Immobile and illiquid, these assets carry an enormous opportunity cost in performance (versus their traditional peers), meaning that our ongoing digital asset issuance is creating a growing blockage in the pipe. With every digital, sovereign bond that is issued, this problem is becoming more acute.

If we are to successfully create an environment where digital assets perform to the same level as their traditional equivalents across the entire security lifecycle, **industry attention now needs to prioritise questions of liquidity, including ecosystem builds, network interoperability and digital cash.**

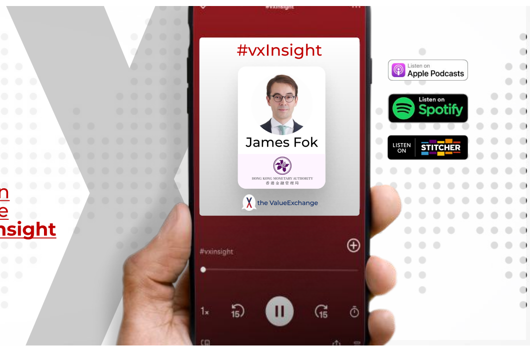
Dig into the details in our podcast series!

DLT in the Real World (Series 3) with the HKMA:

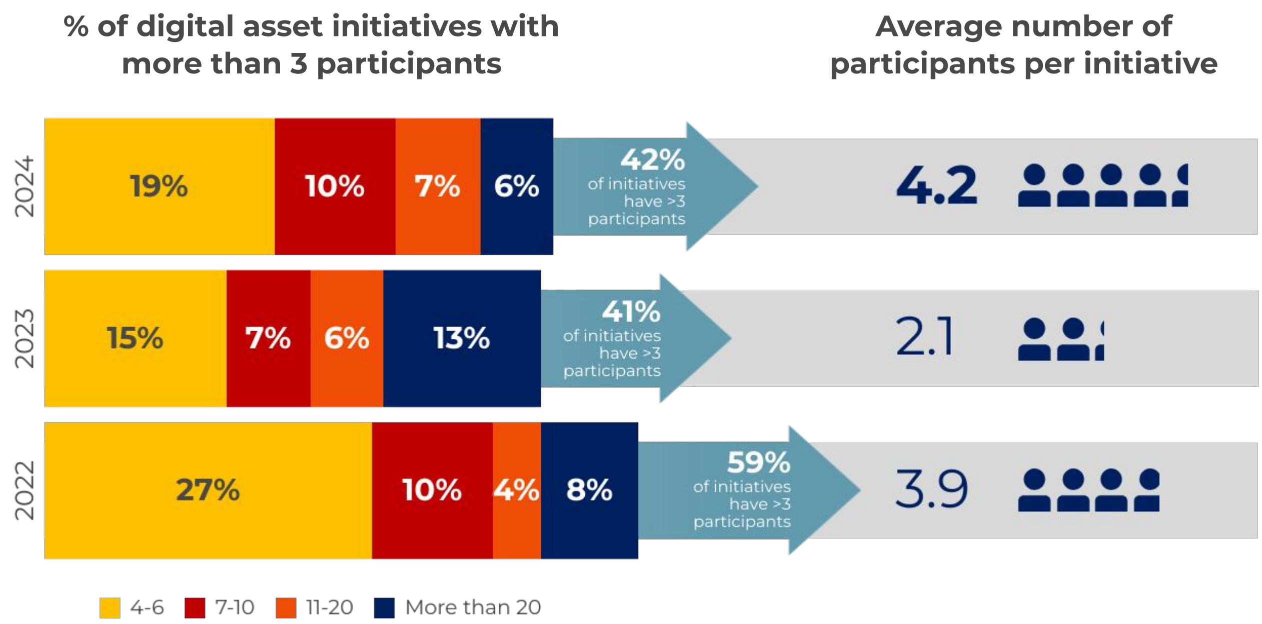
Dig into the details in our podcast series!

In this latest episode of our DLT in the Real World Series (run in partnership with ISSA), **James Fok explains how the Hong Kong Monetary Authority's** CMU has delivered efficiencies of over 1,000 hours per bond issuance, through its Evergreen and Genesys initiatives.

Listen to the **#vxInsight**



4. Digital ecosystems really are multilateral now.



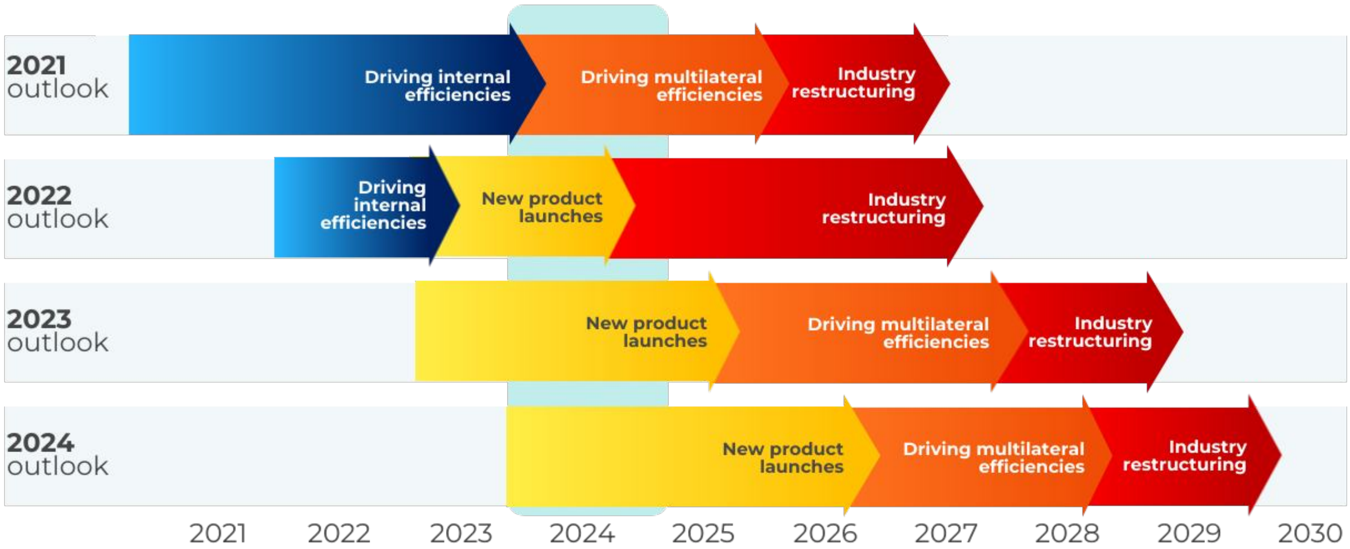
A leading indicator for transactional liquidity is the size of the ecosystem in which the digital assets exist – and thankfully there is cause for optimism here.

No market can be liquid if it has no participants, but fortunately 2024 has seen a return to growth in the average size of digital ecosystems such that **the average DLT platform now includes more than four participants.** In strong contrast to 2023, when the average ecosystem was almost entirely bilateral, the majority of DLT initiatives now have more than 7 participants.

We appear to have moved into **a phase of truly multilateral digital activity** – concentrated largely in the payments / digital cash and fixed income areas above all. And with this multilateral activity, true asset mobility can really begin.

5. We're still two years away from greatness.

How do you see the role of DLT in your industry and over which time horizon?
(#1 impact of DLT and digital assets per year, including a 5 year outlook)



Since 2021 we've tracked the anticipated impact of DLT within organisations. Over time and every year, we have said the same thing: **Meaningful industry transformation is two years away.**

This belief is as strong in 2024 as it was in 2021 – highlighting a continuing gap in our expectations around the likely speed of progress. Despite evidence showing clearly that industry transformation is a slow and evolutionary process, **we appear to still believe that we can generate transformational, multi-lateral benefits from DLT and digital assets within less than 24 months.**

On the one hand, the ambition and urgency that supports this view is welcome and is a driver for change in itself. With numerous initiatives still in Series A and B funding stages, the clock is ticking loudly for some to evidence viable, commercial and digital propositions at scale. Within banks, business plans made in 2021 that forecast rapid growth by 2024 are doubtless coming under increasing scrutiny, business leaders to accelerate **their development as much as possible.**

As we explore below, there are clear signs that this urgency is driving a practical focus on the key enablers to commercial viability and compelling firms to be tactical in their treatment of connectivity and funding options, for example.

That's not to say we haven't seen significant change. Whilst earlier initiatives focused on driving internal efficiencies, over the last two years the emphasis has shifted to multilateral efficiencies in recognition that capital markets transactions involve multiple providers and counterparties. The 'industry restructuring' category has undergone a significant reality check and now follows the multilateral initiatives – appropriate, as no one organisation or initiative can drive systemic change. **As talk of "digital disruption" and "decentralisation of finance" begins to ebb, focus is clearly shifting towards increasing efficiency between counterparties, one step at a time.**

DLT and digital assets

Where is digital liquidity forming - and why?

1. A multitude of regional narratives.

Digital assets and DLT liquidity are evolving at different paces all across the world - such that **there is no single digital narrative in 2024.**

Asia and Europe leading the world in the maturity of their digital activity, with over 40% of firms running live projects, based on early adoption and on the support of highly engaged regulators. Asia has seen the highest levels of sovereign debt issuance in 2024 (largely due to the Hong Kong Monetary Authority), with digital bonds feeding not only institutional but also retail markets across the region. In Europe, the institutional markets are buzzing with regulatory initiatives (such as MICA, the ECB DLT trials, the EU Pilot Regime and the UK Digital sandbox) - all of which are **building new industry guard rails for cryptocurrencies and all types of digital asset** across the region.

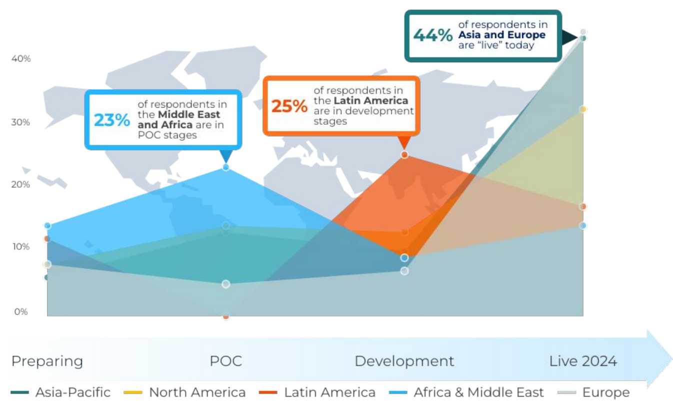
In the US, **2024 has seen a marked contrast in activity across the sell-side and buy-sides.** With banks still unable to transact digital assets in the USA, almost 80% of American digital asset activity is now being run offshore. DLT activity on the buy-side, however, is growing rapidly - mainly in the form of tokenised money market funds (with Blackrock's BUIDL fund surpassing USD500 million in subscriptions in less than five months).

Where are we seeing new life in digital projects? Regions with favorable emerging regulation, like Latin America, where accelerating development can be seen in a number of active pilots including ways to use cryptocurrencies to broaden retail and institutional financial inclusion. Africa and the Middle East have entered an active exploratory phase and are looking at crypto as a way to store wealth and cope with currency fluctuations (particularly in Africa).

Ultimately, we'll need to see convergence between the institutional liquidity that's the focus of more established markets, and the retail crypto liquidity that's at the forefront in Latin America and the Middle East/Africa. Retail investors who have digital wallets represent a growing source of liquidity that will remain off-limits to the exchanges, hampering growth for everyone - including the buy-side that is looking to increase distribution and gain a bigger share of digital wallets. It will be interesting to see this play out in APAC, which could be a bellwether given its dual focus on institutional and retail use cases.

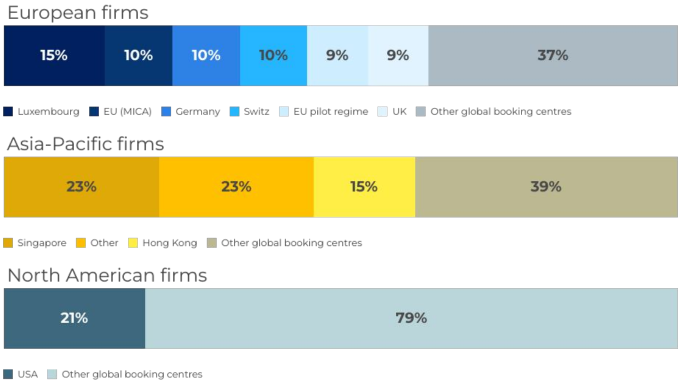
DLT / digital asset activity by stage

(Average % of respondents per year)



Distribution of "live" initiatives by booking centre

(% of total, 2024)



Dig into the details in our podcast series!

DLT in The Real World:
The evolution of the digital assets market in Africa.

In this episode, part of our latest series of **'DLT in The Real World'**, run in partnership with ISSA, we explore how DLT is creating new opportunities for wealth and institutional players across the African markets.

Listen to the **#vxInsight**

2. From operations to treasury: A fast-evolving business case.

And why is digital liquidity forming?

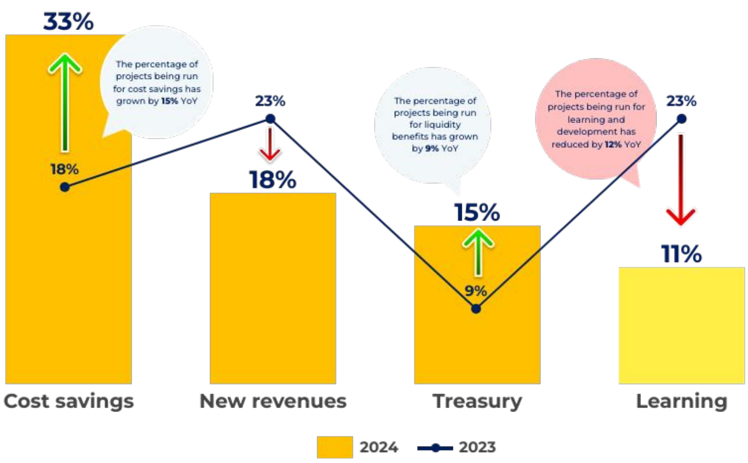
Cost savings are now the biggest driving force behind DLT and digital asset initiatives, replacing "Learning and Development" as the #1 driver of DLT projects in 2024. Cost efficiencies are the easiest to see and to cite as achievements when new solutions go live. While savings are an important component of a successful business case, simply lowering costs isn't enough to spur large investment. The benefits generally reflect a moment in time (such as savings from lower headcount or reduced data) and are quickly internalised once a project goes live. Cost savings are the beginning but can not be the entire business case for digital assets.

Rather than focusing on moment-in-time savings (such as issuing a bond 20% more efficiently), a number of **industry leaders are now focusing their attention on how to leverage DLT to transform their balance** sheets in a way that will deliver hundreds of millions of dollars in savings, every year. Moving to intraday repo, for example, can eliminate overnight funding lines, reduce collateral needs and capital charges - in a way that can drive 10-100x of savings or get rid of hundreds of millions of dollars in liquidity ratios and regulatory capital. The emerging fixed income ecosystem, with its downstream benefits to collateral, lending and capital, is one reason that treasury-driven projects have increased by two-thirds in the last year.

The compelling use case for treasury is delivering impact. Broadridge's DLR platform, for example, is delivering USD 2M+ reductions in operating costs. Both buy and sell side are realizing tangible benefits beyond pure operational efficiency: saving ~25-50 bps of premium by not having to borrow from an internal treasury, avoiding 100+ bps penalties for late-day borrowing, and eliminating overdraft fees caused by failed settlements which can exceed ~300 bps. Capital charges for internal borrowing and daylight overdraft costs are declining, while the ability to meet RQV without overcollateralizing results in an average ~25% clearing cost reduction.

The list of potential benefits is long - and increasingly appealing to both Operations and Treasury heads in 2024.

Top drivers of DLT and digital asset initiatives
(% of respondents citing each objective as core)



Which assets are we using for these objectives?

Cost savings
- Bonds (Vanilla)
- Equities / ETFs
- Securities financing / collateral
- Payments / FX (including CBDC)
- Bonds (Green Finance)

New revenues
- Bonds (Vanilla)
- Equities / ETFs
- Securities financing / collateral
- Payments / FX (including CBDC)
- Bonds (Green Finance)
- Private Equity

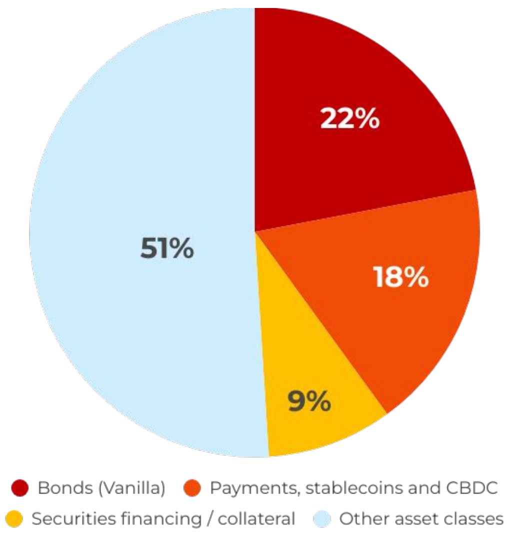
Treasury benefits
- Bonds (Vanilla)
- Payments / FX (including CBDC)
- Securities financing / collateral
- Stablecoins / digital cash
- Private Debt (including loans)
- Money Market Funds

3. Across the sell-side, bonds have momentum.

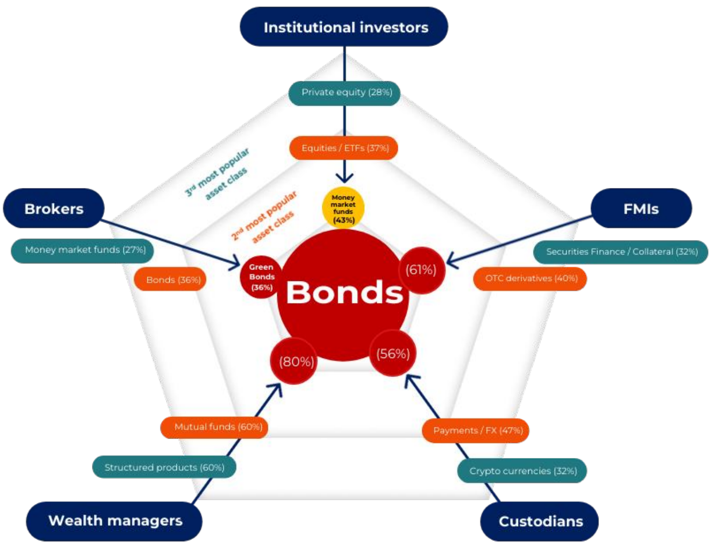
With growing issuance – more than 55% of all digital issuance to date – and liquidity beginning to form, **bonds have emerged as the sell side's most compelling use case,** driven by the utility of bonds, particularly sovereign bonds, in post-trade. Their value as collateral and in securities financing transactions is driving an expansion in use cases and collateral platforms.

These range from established solutions such as Broadridge's DLR platform, which has delivered mobility, intraday liquidity and transparency to the repo markets, to expanding use cases for platforms like J.P. Morgan's Tokenized Collateral Network on Onyx (initially focused on tokenized money market funds and intraday repo) and HQLAX (which is using a digital collateral registry to record ownership and execute real time transfers using a central marketplace). New entrants such as Archax's blockchain solution are looking to tokenise UK government securities and use them in the repo market.

Total Digital Liquidity
(% of total annual digital turnover)



Most popular asset classes per segment
(% of respondents working on each asset class)



A deeper look at annual digital turnover shows how **the collateral lifecycle (including bonds, payments and securities financing trades) now makes up almost half of all institutional digital liquidity.** Better, faster financing and collateral management delivers value at multiple organisational levels, from operational efficiency and risk reduction to lower financing costs and better capital utilisation. This makes it a broadly appealing use case within an organisation and across different organisations – important when you consider who is funding these projects and who is benefiting.

Hong Kong Monetary Authority, Swiss Digital Exchange (SDX), DTCC and ECB have all been active in driving test and live cases around collateral in 2024 - with more to come as Equilend's 1Source platform for securities lending and others come online soon. **Market initiatives in 2025 look set to add further weight to the business case for instantly mobile collateral, with mandatory US Treasury Clearing and additional clearing requirements across many markets triggering further growth in collateral requirements.**

This is one area where the benefits of tokenisation are clear enough to be driving significant transactional activity this year.

Dig into the details in our podcast series!

DLT in the Real World:
Broadridge DLR and the transformational benefits of DLR in treasury.

In this fascinating episode of our DLT in the Real World podcast series (in partnership with ISSA), **Horacio Barakat** and **Paul Chiappetta** join **Barnaby Nelson** to discuss how DLR is already delivering on "phase 2" treasury benefits – well beyond the operational savings that were first envisaged. As one of the most mature uses of DLT in our markets, this is great evidence of the continuing and evolving benefits of the technology.

Listen to the #vxInsight

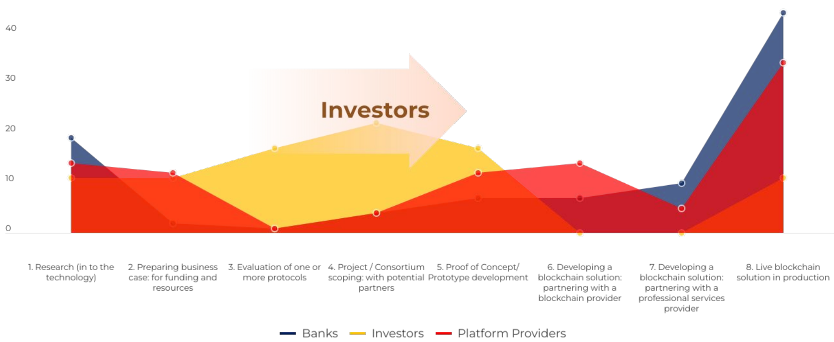
4. Tokenised money market funds: The buy side's entry into DLT.

The buy side is finally engaging in DLT – but not in the ways you might expect. Unlike the operations and portfolio managers who may see benefits from other organisation's post-trade DLT projects, the distribution arm is looking at DLT for revenue growth. The goal? Create digital assets to entice investors who jumped into the crypto markets and capture a share of those new digital wallets.

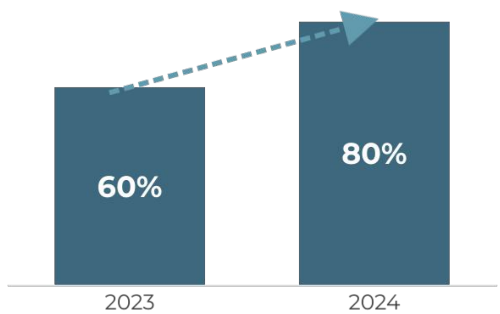
In the process, DLT will redefine the distribution process to improve efficiency and profitability. Layers of intermediaries – bank distributors, wealth managers and RIAs – vanish from the process. Retail investors can open an account and invest in a tokenised fund: It's faster, easier and automated, without the cumbersome and costly distribution processes of the past. **Given the rapid success of Blackrock and other tokenised funds in 2024, it's no surprise that 80% of the buy side sees the value of the distribution opportunity – an enormous change over just three years.**

The strong pipeline of buy-side DLT-driven distribution projects could have some broader ramifications. It may increase pressure for institutional and retail liquidity to converge. It could also perpetuate the split between the private blockchains generally used for institutional assets due to security reasons, and the public blockchains that will be more useful for reaching a broader group of retail investors.

Investors are engaging on DLT in 2024...
(% of respondents' digital asset activities by lifecycle stage)



... seeing it as a key enabler of distribution
(% of investors citing new product opportunities as the key driver for DLT)

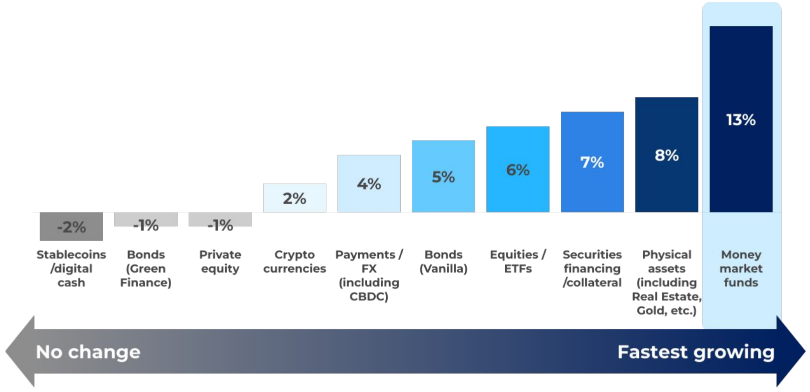


Like digital issuance, money market fund initiatives are early in the transaction chain. This enables benefits to be achieved more quickly as the projects don't get bogged down in the complexities of the post-trade lifecycle. Whilst numerous DLT projects have targeted components of that lifecycle, and the opportunities are real, complex processes and interdependencies have made for slower progress.

By keeping it simple and focusing on immediate, commercial opportunities, **asset managers have succeeded in making tokenised (money market) funds the fastest growing asset class in 2024.**

% Change in levels of industry activity per asset class

(2023-2024)



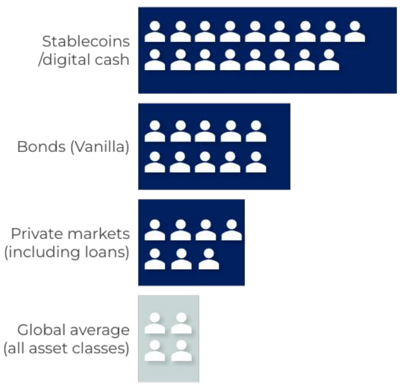
5. Private markets: Coming soon to a market near you.

If fixed income liquidity/mobilisation and mutual fund distribution are the present tense of DLT initiatives, what's hovering on the horizon? A look at where ecosystems are large or growing shows that physical assets are soon to be a digital reality across the capital markets.

Sitting in the top 3 on both lists are private markets and private equity: making them the future tense of DLT initiatives. These assets are critically important to institutional investors and wealth managers seeking higher returns as discussed in ISSA's 2020* Future of Securities Services white paper. Private debt, which appears further down the list, can be folded into this grouping. The decentralisation of private markets creates both an opportunity and a challenge: A challenge because there's no single player that can

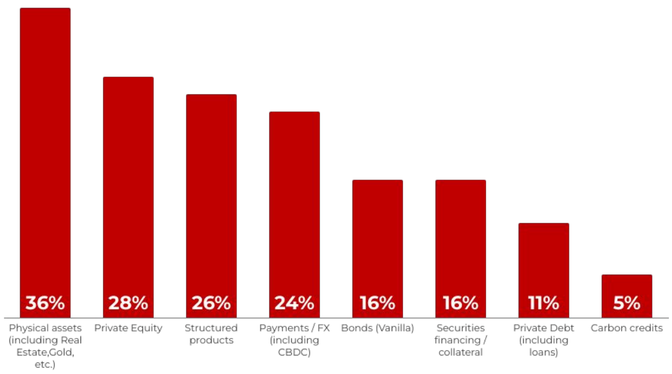
Largest ecosystems today

(Average # of ecosystem participants per initiative)



Fastest growing ecosystems

(Average growth rate of ecosystem participants, 2023-2024)



How can we accelerate growth?

What key obstacles need attention in 2024?

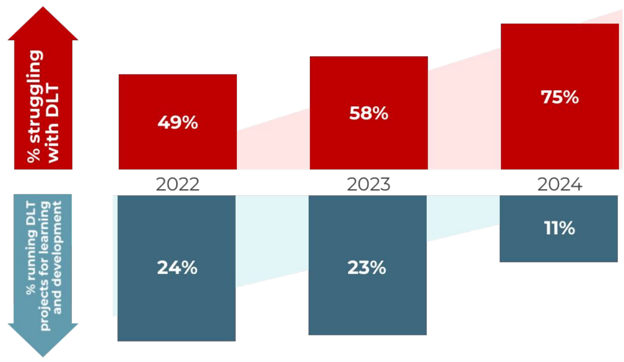
1. Shifting from pilots to live DLT: No simple task.

Despite years of experience and experimentation, DLT appears to be getting harder to use in 2024.

As the number of live DLT applications increases, respondents are experiencing the challenges of deployment and adoption for the first time - and moving from the controlled world of a test environment to a live, commercial DLT application is a big leap.

Plugging digital assets and their applications into core banking systems and payment rails, and incorporating them into balance sheets is fraught with complex challenges. Transacting across counterparties requires testing and system integration. Dealing with new, revenue-paying clients requires brand new contractual agreements.

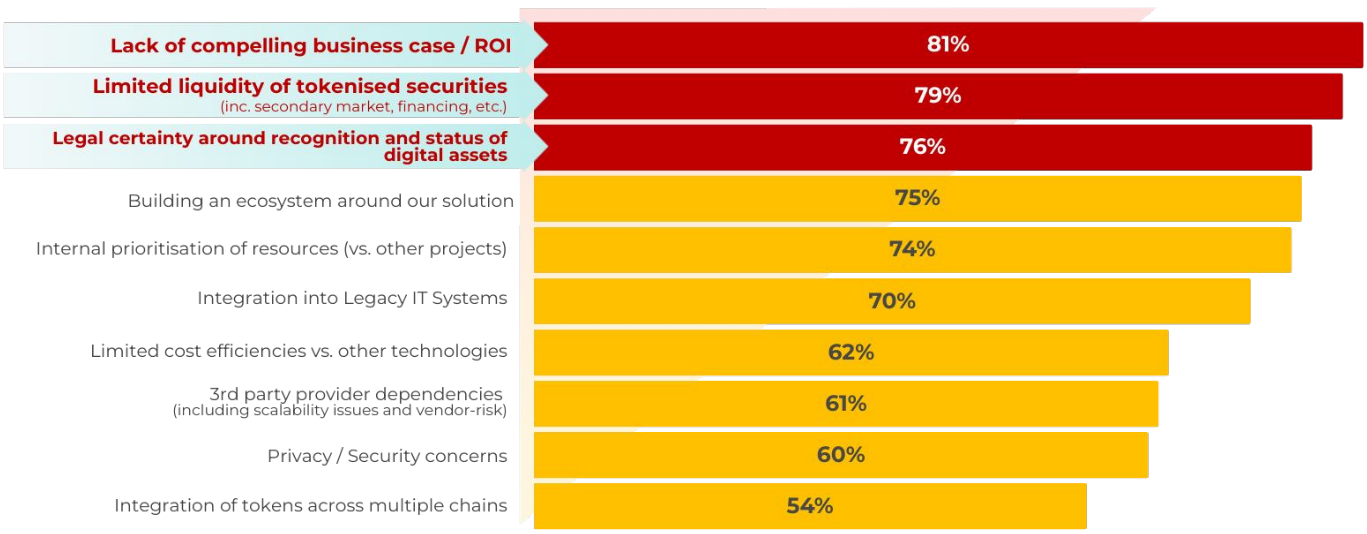
% of respondents facing blocking issues in their deployment and use of DLT / digital assets



All of these needs require input and involvement from control functions (such as legal, compliance, audit, etc.) who may not have been privy to previous rounds of experimentation and pilots. More importantly, these same stakeholders may not even understand why these projects are necessary (see below), making the deployment challenge harder than ever.

Only when these issues have been overcome to considerations of liquidity and legal validity then enter the equation.

Core DLT deployment challenges | **% of respondents struggling with each area** (2024)



2. "You're not solving my problem"

For five years, the single biggest obstacle to DLT / digital asset development has been the business case. So what does that mean in 2024?

Simply put, it means that the three biggest intended beneficiaries of DLT projects are the least engaged, and 86% of them don't understand the business case for DLT at all.

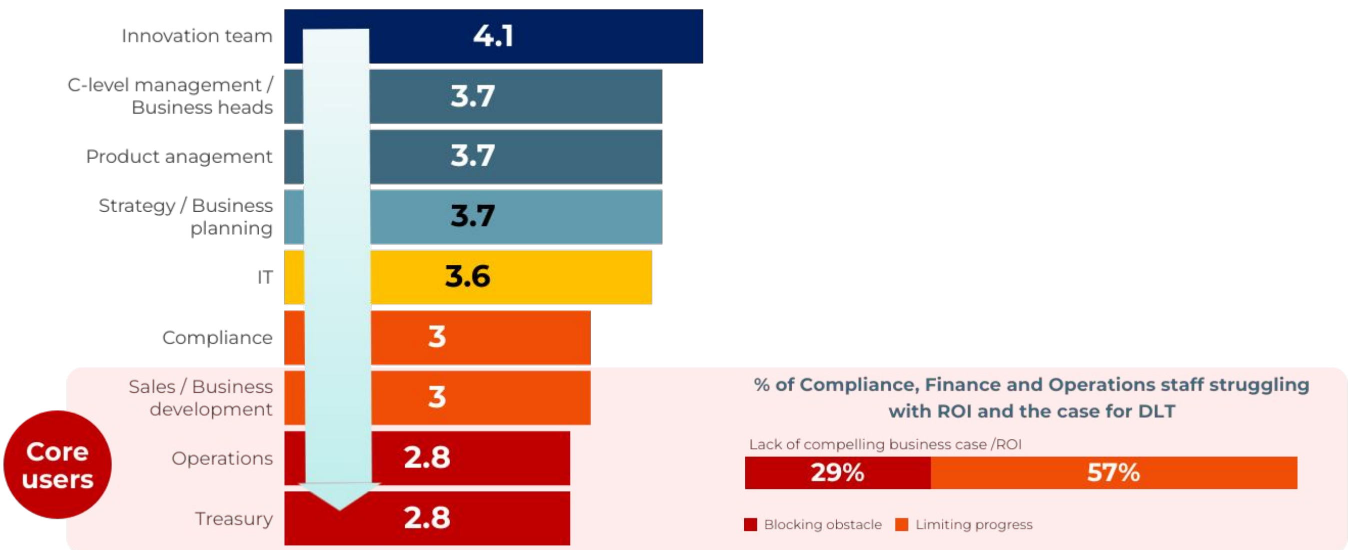
At the heart of the DLT deployment challenge is the fact that we are not speaking to the right people. As we explain above, we know that DLT's business case today is strongly anchored around cost efficiencies, treasury benefits and new product revenues. Yet the three core stakeholders who should benefit from these outcomes (i.e. Operations, Treasury and Sales) are the least engaged on digital asset initiatives today. Not surprisingly, almost all of them are struggling to understand what all the (digital) fuss is about.

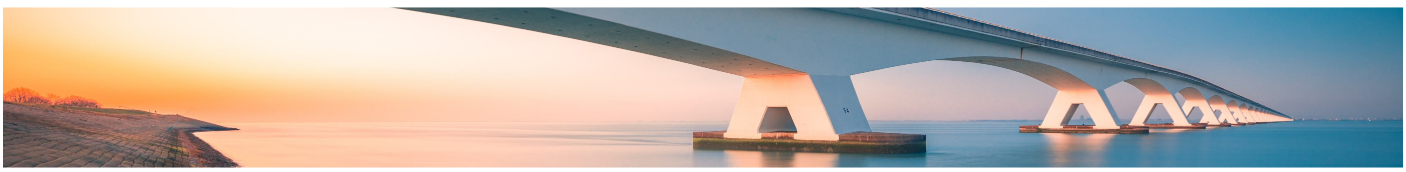
It's a problem of perspective. Today's DLT and digital asset initiatives continue to be driven by innovation, strategy or product teams, or by C-level business management. The core users who should be most involved in setting the priorities, identifying the problem or determining the solution are not – and worse, they don't even see the need. management. The core users who should be most involved in setting the priorities, identifying the problem or determining the solution are not – and worse, they don't even see the need.

That lack of engagement is a real risk. At best it means that the people running our businesses don't understand the benefits that DLT and digital assets are able to deliver. At worst, it means that their lack of engagement (and understanding) will form an active blockage to progress, as they refuse to allocate investment budgets and time to digital initiatives.

The solution is concerted engagement and real listening to ensure that digital innovation can be put on a path of convergence with the multitude of pressing priorities that core business managers face every day. It is not enough that the DLT and digital assets deliver benefits, we need DLT to be visibly solving the problems that matter to operations, treasury and sales heads if we are to see meaningful investme nt and adoption.

Who is leading our DLT and digital asset initiatives today?
(leadership by function, out of 5 - where 5 is core champion)





3. Security is winning over liquidity.

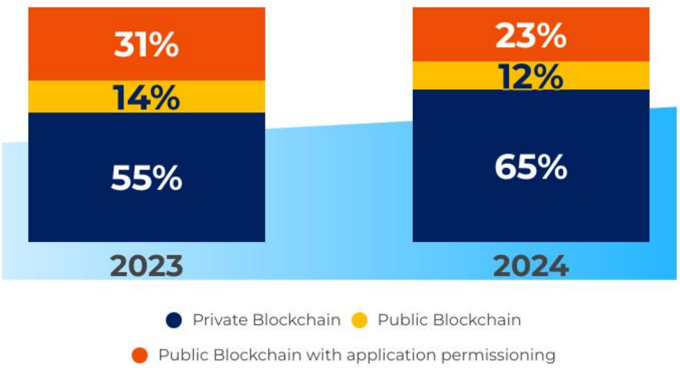
2024 has seen a significant increase in the use of private blockchains - potentially putting at risk the objective of bringing together isolated liquidity through wider, more aggregated networks.

Security has long been front of mind for the sell side, where the risk of exposing either your own or client data to competitors is a non-starter. But in 2024, guidance such as the BIS's SC060 has imposed punitive risk weightings to all profiles of digital assets if they are managed on permissionless blockchains. For the first time, underlying technology and network choices are now effecting asset treatment - putting banking institutions around the world on an inevitable path towards private, closely managed and secure networks.

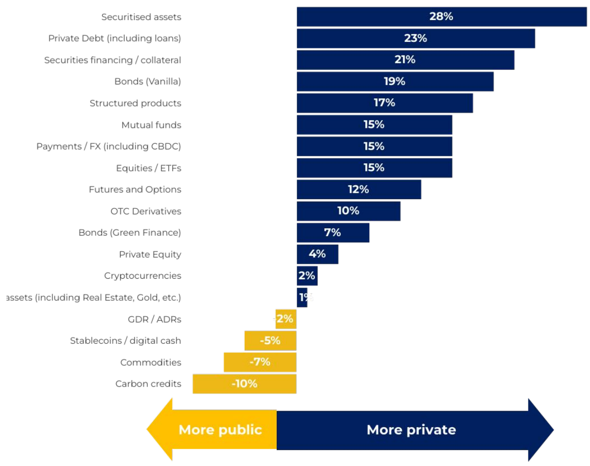
Unfortunately, **this comes at a cost - as private blockchains create individual digital islands with limited ability to interact.** The inability to deepen liquidity makes private blockchains a less-than-optimal solution. Whilst bridges and message-based protocols can orchestrate interactions with other blockchains and provide a semblance of interoperability, this is an imperfect solution as it reintroduces sequential processes, critical points of failure and potential errors into DLT workflows.

We will need to find a way for public and private chains to interoperate, so that new digital assets and tokenized traditional assets can interact. Otherwise we'll create more fragmentation, limited liquidity, along with a lack of asset utility and mobility. The benefits we're trying so hard to achieve will remain elusive.

% of respondents using each type of blockchain



% change in private blockchain usage 2023/2024



4. Interoperability: Whose responsibility?

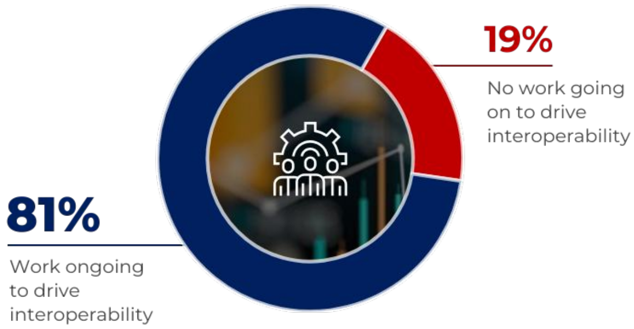
In a year when the focus transactional liquidity is paramount, everyone recognises that interoperability is critical to the continued evolution of DLT and digital assets. Across the world, **2024 has seen a multitude of interoperability initiatives begin, at both large and small scales.** The Global Layer 1 initiative (led by the Monetary Authority of Singapore), the Regulated Settlement Network (under SIFMA's leadership in the USA) and Project Agora (by the BIS) have attracted more than 100 firms in total so far - and look set to provide meaningful, additional clarity on industry models in 2025. On the commercial side, Canton now connects over 45 organisations across a single digital network.

But whilst there is a lot of work underway to achieve it, it's worth looking at where those endeavors are best placed. As the last five years have shown, the ability for any one issuer or investment bank provider to make a meaningful impact on interoperability is limited at best.

Based on our survey, the centre-point of interoperability is, instead, at the application level today - meaning that **platform providers need to ensure that their data models are consistent and transferable, and that they are able to effectively process transfers of tokens** from their platform to another. The only core responsibility of the network provider is to ensure legal certainty of transfers.

Industry discussion continues about how this standardisation of data models can be effected - with the Common Domain Model (CDM) and ISO20022 both offering potential solutions as the core data models for securities held on chain. Which standard prevails, in which context, looks set to be a core theme of discussion for 2025 and beyond.

% of respondents who are building live / commercial propositions and who are focusing on interoperability today



What are the roles and responsibilities for interoperability?

(% of respondents working on interoperability at each stage and level)

	Issuer level (i.e. Investment banks)	Network level (i.e. Blockchain operators)	Application level (i.e. platform providers)	Wallet level (i.e. digital wallet providers)
Data models (security data, etc.)	25%	33%	33%	5%
Technical processing of transfers	7%	33%	42%	19%
Legal validity of transfers	14%	44%	31%	11%

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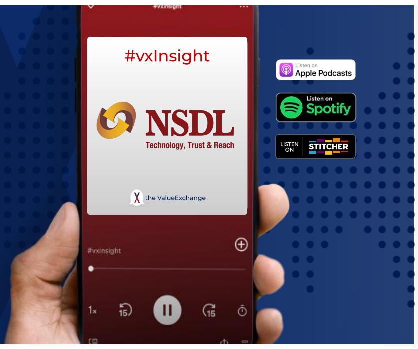
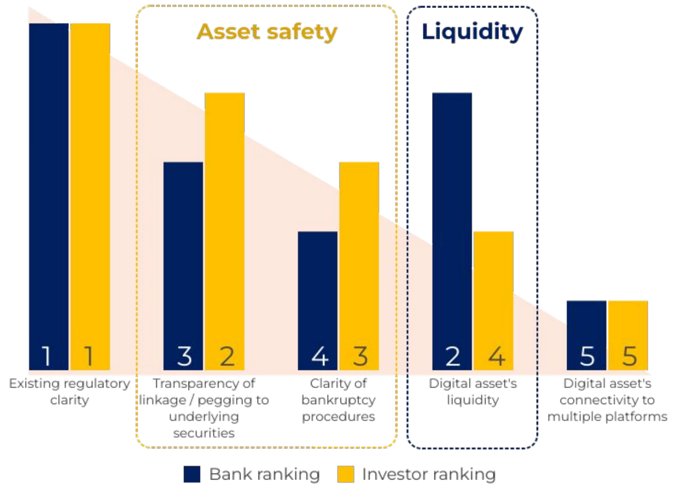
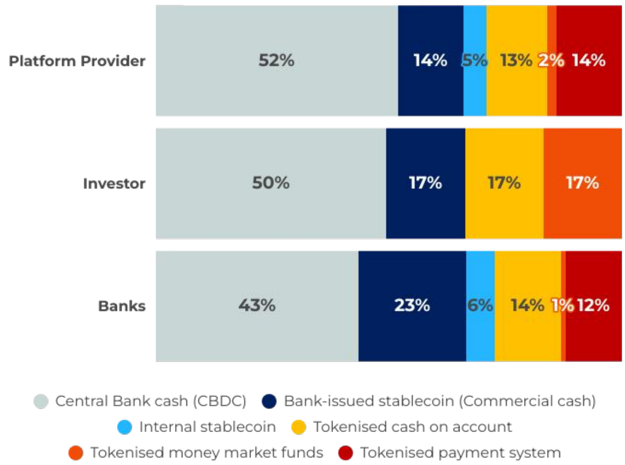


5. Digital cash: What exactly do we want?

What do we want from digital cash?
(Ranking of core requirements for Cash legs – by segment)



...and what digital cash types are we using?
(Types of digital cash used – by segment)



Since our research began in 2019, firms have been adamant that Central Bank digital cash (in the form of CBDCs) was the only viable form of digital cash for them.

Yet in 2024, the absence of any viable forms of CBDCs has combined with the growing pressure on firms to launch commercially viable digital platforms to form a trigger for many firms to finally see past CBDCs - and to operationalise other forms of cash token.

The challenge however is that **there is limited consensus around exactly what those cash tokens should look like.** For banks (driven as they are by Basel and LCR rules), the priority is liquidity - how to strengthen the resilience of the token by ensuring that it is backed by extensive market depth and turnover? Yet investors (subject to UCITS, 40 Act or ERISA regulations) are more concerned about the transparency of their tokens - can they withstand days of extensive due diligence from a credit, market and operational risk perspective (and are all eventualities entirely provided for)?

Perhaps due to this strong divergence of objectives, there is no clear digital cash token emerging to take the place today of the CBDC.

Whilst 57% of banks and 50% of investors are now using non-CBDC tokens in their daily, live operations, **no single form of digital cash is predominant.** Bank-issued stablecoins appear popular between banks, but tokenised payment systems (such as Fnality in the UK) and tokenised deposits also play a role.

This is doubtless set to change.

In Hong Kong, for example, new regulations around stablecoins will elevate levels of transparency and resilience in the near future - making them more appealing to conservative investment managers (albeit most often in a domestic context and without cross-border scale).

More importantly, tokenised money market funds appear to be gaining ground quickly. They are asset-backed and so constitute a counterparty risk improvement over a cash liability from a bank - and they are also income bearing. If they can be successfully mobilised to the requisite levels of liquidity (as Calastone and Digital assets are demonstrating), **money market funds could potentially offer a transformational, new cash mechanism to support a new wave of digital liquidity.**

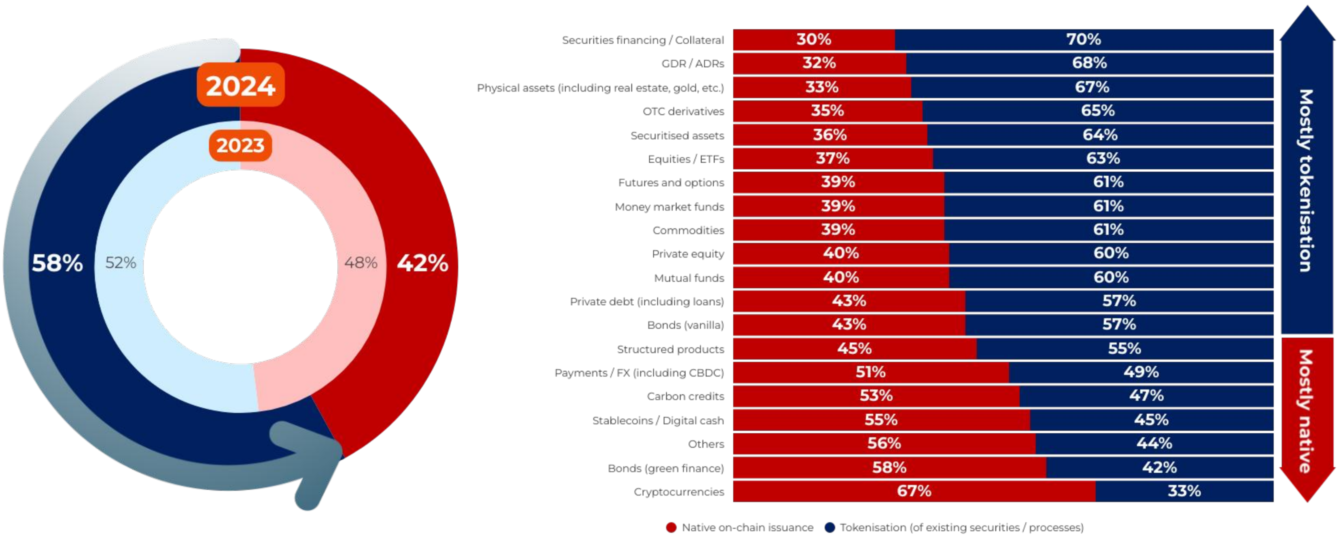
6. Tokenisation: The bedrock of future growth.

Whilst continuing questions around regulatory certainty stand in the way of much native digital asset activity, 2024 has seen the landscape for tokenisation advance significantly - to the point where it now forms the majority of DLT and digital asset activity around the world. Reinforced by regulatory guidance from BIS, FINRA and others, firms are now increasingly confident in their ability to treat tokenised securities in the same way as they do the traditional underlyings (in terms of accounting, risk, etc.), so long as the 'pegging' between the two is entirely resilient. Regulatory obstacles are falling away.

This opens up extensive possibilities and has facilitated the tokenisation of all kinds of assets in 2024 - from trillions of dollars in collateral and derivatives all the way through to carbon credits (in North Trust's Carbon Ecosystem, for example).

Looking ahead, tokenisation looks set to be the cornerstone of the next phase of DLT and digital asset growth - addressing as it does all of the major concerns faced by the industry today. Tokens are easier to explain and to operationalise (addressing the core issue around stakeholder engagment and ROI). They naturally act as a 'bridge' between liquidity in traditional market securities and in natively digital securities - and hence negate the need for painful choices of digital versus traditional liquidity. And they are increasingly (legally) viable - even in the most stringent of regulatory regimes.

% of Project activity by digital asset type



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