Tokenisation:
Propelling innovation at speed

Rajeev Tummala
Director, Digital & Data,
Securities Services

Rachel Roch
Product Analyst, Digital & Data,
Securities Services

Xin Yi Tan
Product Analyst, Digital & Data,
Securities Services

Bryan Goh
Graduate Analyst,
Securities Services

HSBC | Opening up a world of opportunity

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Tokenisation: Propelling innovation at speed

This is the second article in our series exploring the vast opportunities created by tokenisation enabled by distributed ledger technology. Our first article considered the potential of tokenisation to democratise access to investment opportunities. This piece explores how tokenisation can accelerate broader product innovation in financial markets, benefiting both institutional and everyday investors.

In 1989, a British scientist wrote a paper proposing a solution to meet demand for automated information sharing between scientists around the world. Hardly sounds like the most exciting topic, does it? But this paper, written by Tim Berners-Lee, which led to the invention of the World Wide Web, was crucial in igniting an online revolution amongst the public that continues to accelerate today – the internet. Back then, it was probably hard to imagine that the internet and the web would collectively leave such an indelible mark on everyone's lives to come.

Since then, we've seen the internet evolve, and the value created by the internet has scaled up exponentially as we moved from Web 1.0 to Web 2.0. Users shifted from only being able to read static information on webpages to being able to publish content, interact and build relationships across a geographically-distributed community. This saw adoption take off, evidenced by the increase in social network users from 2.86 billion users in 2017 to a projected 4.41 billion in 2025[1]. And the internet's next paradigm is coming.

Powered by DLT and taking inspiration from blockchain protocols, the decentralised manner in which Web 3.0 operates will have far-reaching implications across industries. There is much more to be discovered on DLT applications for financial services. We believe that DLT and tokenisation will reshape financial markets by creating completely new asset classes, spurring product innovation and bringing customised solutions not just to large financial institutions but everyday investors.

What is tokenisation?

Tokenisation is the process of issuing a token that represents an asset. A token acts as a digital certificate of authenticity, enabled by DLT. Tokens essentially exist as strings of code on the blockchain, a distributed ledger that keeps track of transactions, and allows for online digital assets to have verifiable validity and proof of ownership that is immutable.

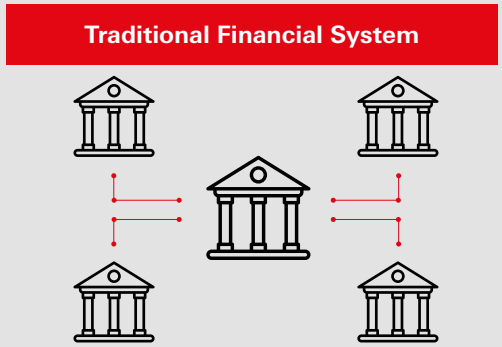
More details on tokenisation can be found here.

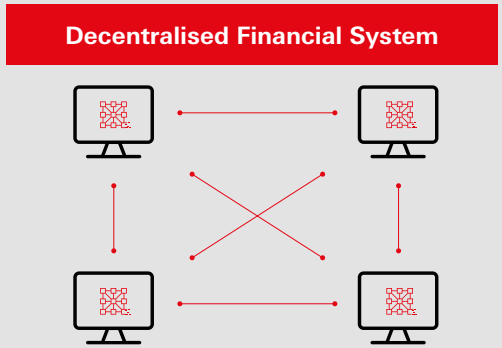
[1] Number of social media users 2025 | Statista

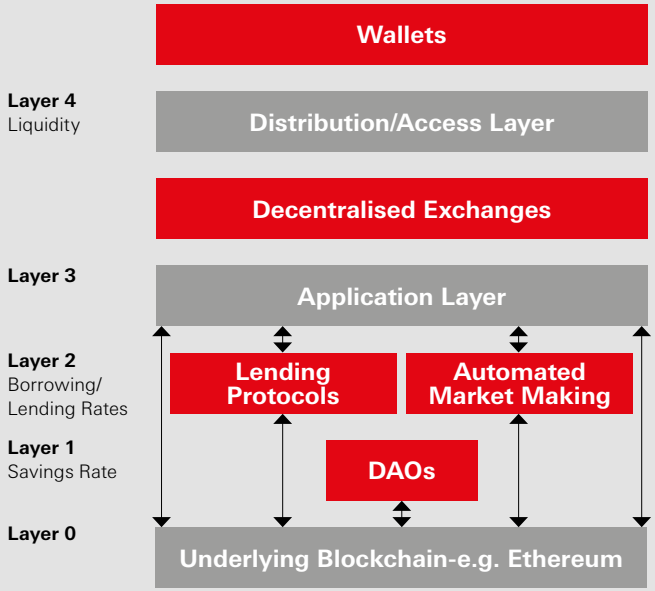
DeFi and NFTs: Discovering a New Universe

Decentralised Finance (DeFi)

The development of a completely new ecosystem, DeFi, has been touted as the next wave of financial innovation. It has the potential to cause disintermediation to financial institutions through the use of smart contracts, creating programmable assets. So far, participation has been keen, with a total value of $90.95 billion currently locked in DeFi platforms[2].







What is DeFi?

DeFi, in a nutshell, is an alternative financial infrastructure that is decentralised (i.e., intermediaries do not need to exist between parties to a financial transaction) and built on smart contracts. Smart contracts are programs that run on blockchain and can execute automatically once certain conditions are met. They allow developers to create programs known as decentralised apps (dapps).

The DeFi ecosystem operates very differently from the traditional banking system, as it is a peer-to-peer market where financial services can be delivered in an automatic, trustless manner. DeFi has given rise to a wide range of new investment opportunities. In this ecosystem, lending, synthetic assets, insurance and automatic token exchanges can happen directly between parties who use the same blockchain via dapps. DeFi Lending protocols have emerged which allow users to borrow and lend digital assets directly to other users, with interest rates fluctuating in real time based on supply and demand. This removes the need to pay fees to a central third party and creates greater flexibility – there are no pre-defined loan durations and users are free to withdraw or repay at any time.

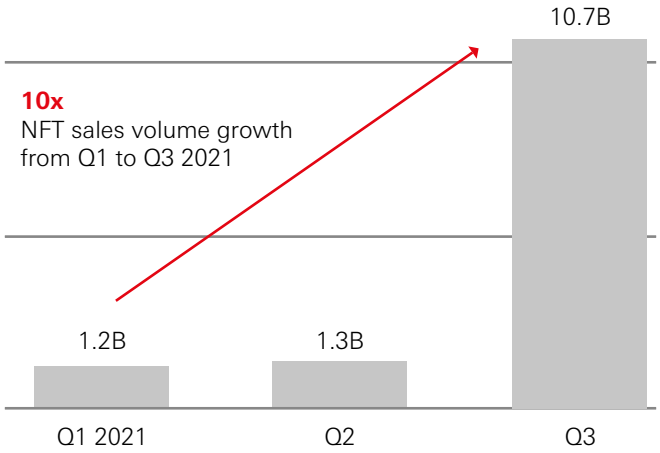
[2] DeFi Pulse - The Decentralized Finance Leaderboard

Yield farming, lending and staking of cryptoassets to generate returns are additional investment opportunities. Staking involves locking up cryptoassets and agreeing not to withdraw them for a period of time as a way of contributing to a blockchain network. In return, stakers can earn additional coins or tokens. Staking also allows investors to participate in the governance of the blockchain protocol. For example, on a 'proof of stake' blockchain such as Ethereum 2.0, stakers will be able to validate transactions in exchange for staking rewards. Decentralisation can be extended beyond individual networks and applications to the running of companies themselves. Decentralised Autonomous Organisations (DAO) are member owned communities without a typical centralised leadership and management structure. There are examples of digital currencies which have adopted aspects of DAOs, where decision making on the use of mining proceeds is decentralised among specific network participants rather than being controlled by a central executive leadership team. Since DAOs are a marked departure from typical firm structures, there are significant legal and operational uncertainties that need to be addressed. Legal and regulatory clarity in the DeFi ecosystem as a whole is essential in order to spur large scale institutional adoption. One thing is for certain - current use cases are only the tip of the iceberg of what is possible with DeFi and there is much more to discover with this pioneering innovation.

Democratising access to financial services is at the core of decentralised finance (DeFi). Similarly, NFTs have opened up unprecedented opportunities for investors to purchase assets directly from the creators, without the need for a centralised party.

Non-fungible Tokens (NFTs)

Quarterly NFT sales volumes across blockchains (USD)



Source: https://www.reuters.com/article/fintech-nft-q3-idCAKBN2GU298

One of the areas in the digital assets world that has really taken off this year is NFTs. They have been around since 2014 but have only recently gained popularity, with some believing that they will change investing. Earlier this year, the US$69.3 million NFT auction sale at Christie's[3] by digital artist Beeple (the third highest amount ever paid for a piece of art by a living artist) – created a buzz in major news publications and thrust NFTs into the limelight. Trading volume in Q3 2021 surged to $10.7 billion[4] compared to the last quarter, part of a broader expansion in the blockchain narrative.

So, what are NFTs, exactly? NFTs are digital assets that represent unique tangible and intangible assets – which can range from digital art, videos, sneakers[5], sports cards and even a tweet[6]. As its name suggests, these tokens are non-fungible, meaning they cannot be exchanged for one another, and each NFT is unique.

This innovative asset class has unleashed opportunities for artists like never before, bringing value to works created in the digital space. Increasing interest in NFTs has benefited the creator economy, empowering all creators to keep a majority of the profits by selling directly to consumers and allowing collectors to purchase digital art.

Furthermore, NFTs can be programmed with specific parameters. For example, conditions can be specified such that whenever the NFT is resold, the original creator can receive a percentage of income from the resale of their artwork. With such innovative characteristics, it's enormously appealing for both creators and investors to jump into this digital ecosystem.

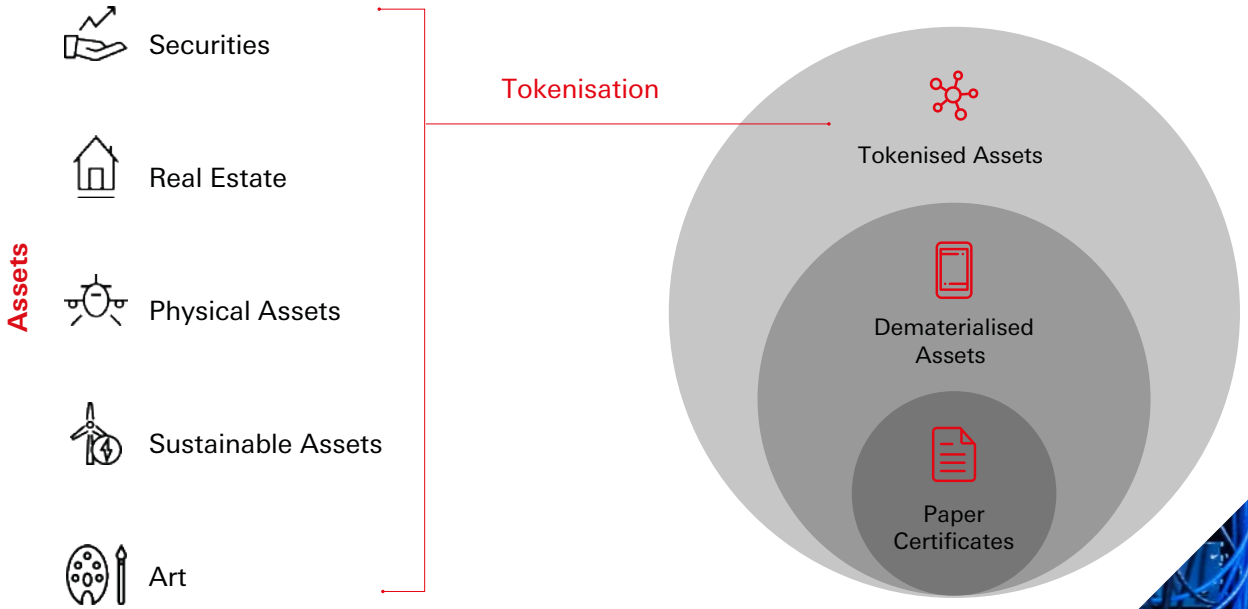
[3] https://www.christies.com/about-us/press-archive/details?PressReleaseID=9970&lid=1
[4] https://www.coindesk.com/business/2021/10/05/nft-trading-volume-surges-700-to-107b-in-q3/
[5] https://thenextweb.com/news/nike-blockchain-sneakers-cryptokick-patent
[6] https://www.cnbc.com/2021/03/22/jack-dorsey-sells-his-first-tweet-ever-as-an-nft-for-over-2point9-million.html

From Sputnik to Starbase: Revolutionising the Traditional World

Besides enabling new types of assets like NFTs, tokenisation is also set to revolutionise traditional assets like stocks and bonds. Tokenisation of traditional assets can be seen as simply the next evolution in asset representation. Just as the shift from physical (paper certificates) to dematerialised (electronic entries in a database) forms of asset representation changed capital markets, the adoption of tokenised assets will accelerate growth and spur product innovation.

We are already seeing evidence of the growing demand for tokenised assets. A World Economic Forum report estimates that the size of traditional markets that could potentially benefit from tokenisation is $867 trillion – covering equity, debt, derivatives and securitised products markets[7].

The growth and increasing adoption of tokenised assets has the potential to catalyse a new wave of product innovation in financial services.



[7] https://www.coindesk.com/world-economic-forum-blockchain-disruption

Build your own asset

The opportunities are limitless in terms of types of tokenised products that can be created. Recent years have seen a growth in platforms offering products such as tokenised gold, real estate and carbon credits, which are experiencing significant demand from investors. Recent reports estimate that the total market capitalisation of gold-backed tokens has grown 30 times since the beginning of 2020[8]. In September 2021, MOSS, the largest environmental platform globally to tokenise carbon credits, listed their MCO2 token on Gemini, a major digital assets exchange, enabling accessibility to a wider investor base and sending US$10 million in 8 months to Amazon forest conservation projects[9].

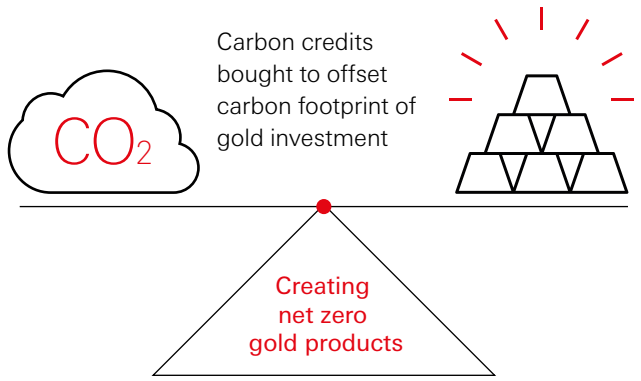
Tokenisation can significantly reduce the manual processes and costs involved in structuring layered products, making a greater range of these products accessible. An example would be net-zero tokenised gold products – structured such that for each ounce of gold purchased, sufficient carbon credit tokens will be bought to offset the carbon footprint of the gold. This provides investors with a sustainable way to invest in commodities and facilitates the transition to a net-zero economy.

Tokenisation can also enable existing assets to be customised at a granular level at a lower cost. Consider a standard coupon payment for a corporate bond. Currently, due to the multiple manual steps involved, it is rare for bonds to have a coupon frequency higher than once every six months. For a tokenised bond, smart contracts can automatically compute and execute coupon payments, significantly lowering the cost involved. Coupons could easily be paid weekly or even daily. Issuers would have much greater flexibility to tailor and customise bond terms to meet investor preferences.

How do DLT and smart contracts lower costs and increase optionality?

Smart contracts are used to model the rights and obligations of the tokens, governing the logic and automating asset lifecycles. DLT lowers costs due to simplification of multiparty workflows and eliminating the manual effort that exists today.

Layered tokenised products
Example: Net-zero tokenised gold product



New infrastructure: Launchpad for tokenised assets

To support the burgeoning diversity of tokenised assets, new infrastructures have sprung up – from licensed digital asset exchanges in jurisdictions such as Singapore, Hong Kong[10] and Switzerland, to NFT marketplaces like Nifty Gateway and OpenSea. These infrastructures are vital in driving demand and accelerating innovation in this space. However, most still exist as disparate ecosystems, and there is a need for DLT bridges to enhance interoperability among various networks.

[8] https://www.coindesk.com/gold-tokens-take-off-as-inflation-accelerates-bitcoin-retreats
[9] https://mco2token.moss.earth/
[10] https://fintechnews.hk/15396/blockchain/hong-kong-digital-asset-exchange-to-launch-first-nft-trading-platform-in-hong-kong/

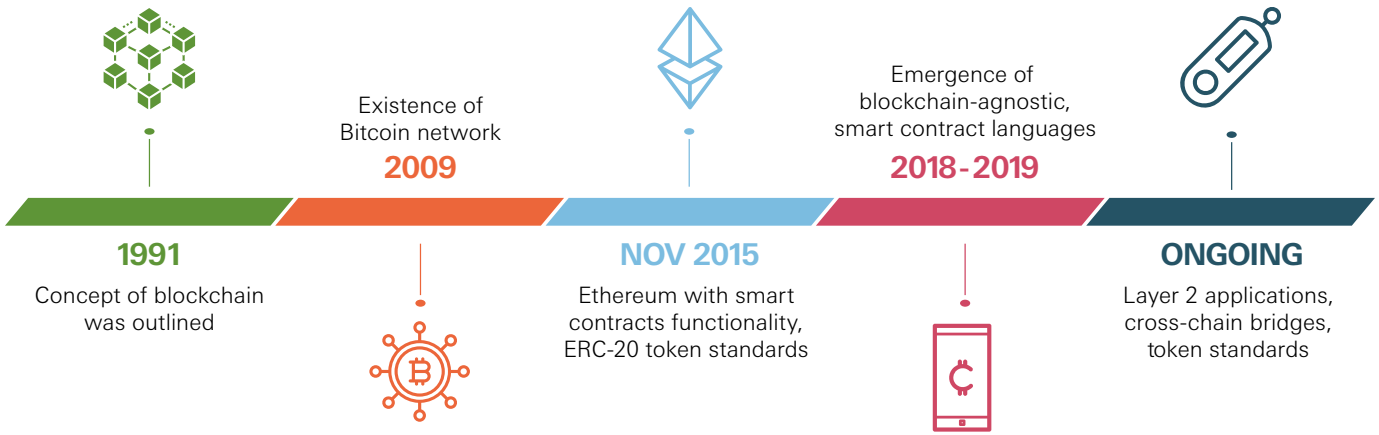
Solving challenges to adoption: Not rocket science!

Interoperability

To achieve a harmonious integration of different DLT networks, the key challenge of interoperability across different ecosystems needs to be addressed. Even within the traditional financial services industry, interoperability is a concern – there have been a number of separate standalone pilot projects involving tokenised assets in recent years. For example, in the tokenised bond space, we have seen more than ten notable initiatives since 2018, ranging from the European Investment Bank's (EIB) public blockchain bond issuance to institutional investors, to Bank of Thailand's government bonds offered to retail investors. HSBC has also participated in this space, partnering with SGX and Temasek Holdings to develop a platform for the issuance and servicing of tokenised bonds. However, these initiatives usually exist in their disparate blockchains, operating in silos, resulting in unrealised benefits of a cumulative network effect.

Once interoperability is tackled, we will see acceleration in the usage of blockchain applications integrated across various enterprises. There are numerous way of integrating blockchains either through APIs or network of networks effect. For the former, APIs can help integrate two separate blockchains on an individualised basis. However, the lack of a defined governance can make integrations between multiple blockchains onerous. For the latter, relying on multiple network connections across blockchains and establishing industry token standards can scale and create a congruous environment for cross-blockchain applications. Well-known token standards such as the ERC-20, an interface for fungible tokens, are increasingly used to support compatibility with the Ethereum network. Furthermore, smart contract languages such as Digital Assets Modelling Language (DAML) can make future integrations possible through enabling interoperability across enterprise blockchains. Various other initiatives include companies such as Consensys[11], who has developed a universal token that can support all asset types across both centralised and decentralised use cases on the Ethereum blockchain. In realising a multi-chain future, blockchain bridges (e.g., Polkadot) can be used to connect different chains that have distinct governance and rules, relaying external data and tokens. Whilst interoperability is certainly a challenge, efforts are made towards tearing down the walls between blockchain networks.

What about the gap between centralised and decentralised finance? How can this be bridged? With the growth of DeFi protocols, there is a role that traditional financial institutions can play to serve as a conduit between traditional finance and DeFi. Through providing such banking services to consumers, tokenised assets and any other experimental financial instruments can be traded and cleared using smart contracts anytime, resulting in immediate trades and lower transaction fees due to the lack of a middleman. As decentralised exchanges are non-custodial, a credible third party like a custodian can be involved to provide protection of private keys and ensure a safe transfer of assets from off-chain to on-chain. A potential role for banks to consider would be to serve as a universal adaptor to various DeFi networks. This would help to bridge the gap between the traditional fiat economy and the decentralised economy.



Consistency in regulations

The potential of tokenisation is clear. Now, what is needed to make it a reality? In our previous paper, we listed regulatory uncertainty as a key challenge. Several jurisdictions, including Singapore, Hong Kong and the United Kingdom have since made progress in this area and have released guidance specifying that tokenised forms of traditional securities remain subject to existing regulatory regimes governing traditional financial securities. Moreover, some regulators have introduced a fresh set of legislation to modulate the issuance of asset tokens. While this is a good start, greater clarity, communication and consistency from regulatory bodies around the world is essential to spur innovation and growth in this space.

[11] https://consensys.net/codefi/assets/universal-token/

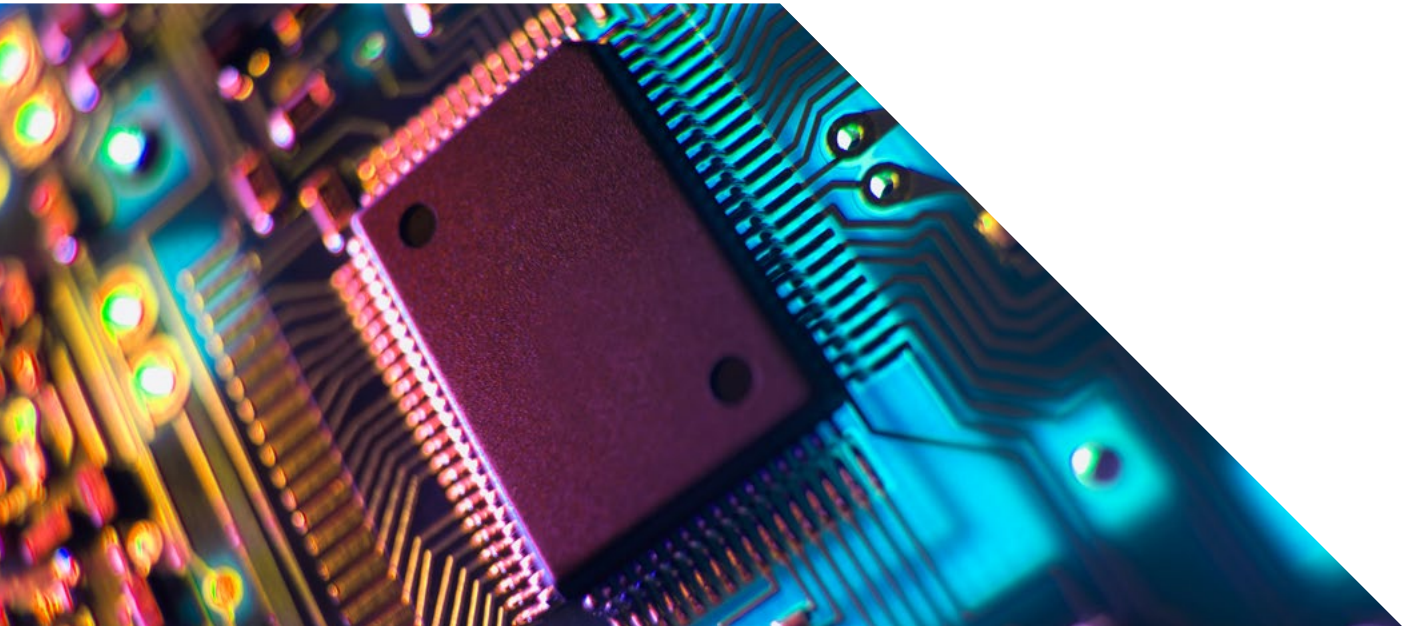
3, 2, 1...Lift-Off

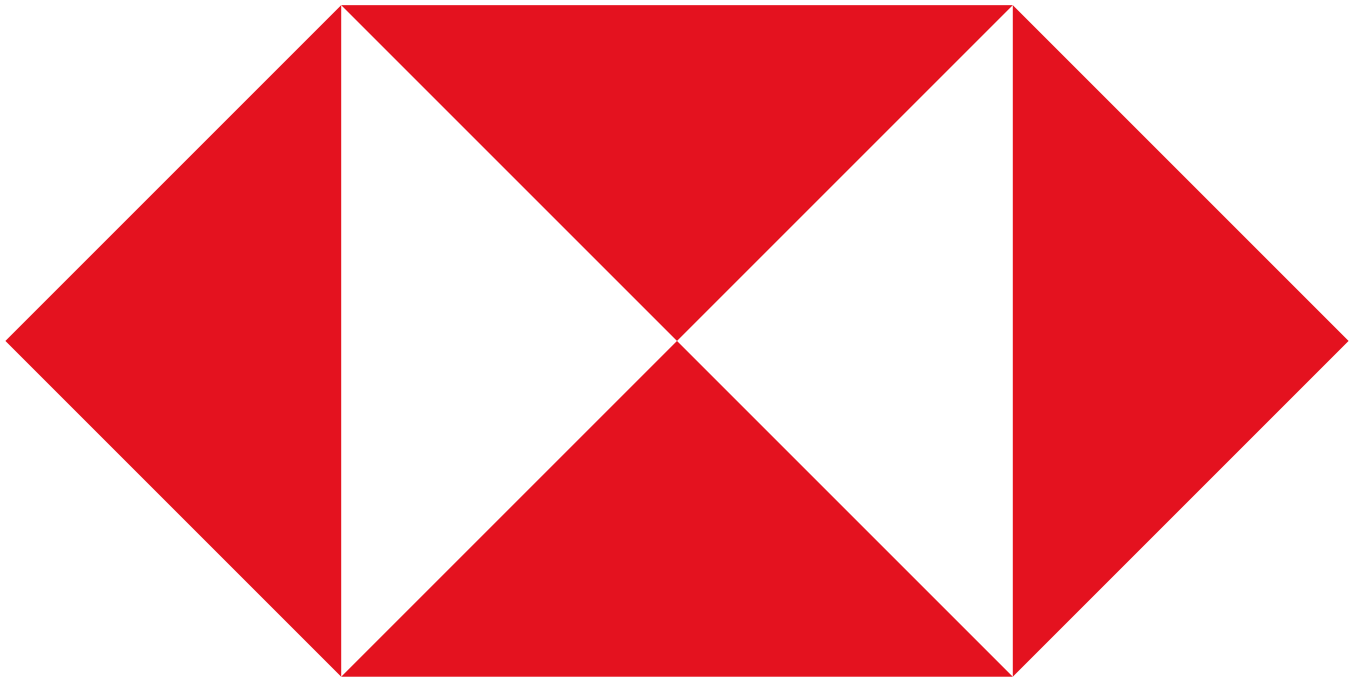
Within 10 years of its invention, the internet reached a turning point, transforming from a tool for reading static information to one that enables global communities and powers numerous applications by cloud, mobile and social networks. The internet was adopted so rapidly because of its accessibility and low cost. Similar factors will serve as catalysts towards the next paradigm for blockchain and tokenisation.

Efforts to address interoperability and regulatory clarity would enable greater accessibility, whereas the cost of participation in DLT networks will naturally decline over the course of time, with more new protocols being created to address throughput and scalability. Whilst NFTs and DeFi are showing us how completely new asset classes and ecosystems can be shaped by DLT, the journey towards revolutionising asset representation for traditional assets is just starting to gain traction.

> "True breakthroughs don't happen by being more efficient at what we already do. They happen by doing what was hitherto impossible."

Beyond being more efficient at what we already do, we see extensive opportunities for blockchain and tokenisation to propel innovation and radically transform existing ecosystems. This journey cannot be undertaken alone. We look forward to exploring and co-creating innovative solutions with our clients and partners to fuel the tokenised economy. The countdown is on, prepare for lift-off.





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