



# The Asset Tokenization C-Suite Playbook





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Our goal is to promote engagement in the FinTech ecosystem through events, membership programs, and knowledge sharing.

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# Overview

The rise of digital assets is a significant development within the financial landscape; having garnered considerable interest from institutional investors in recent years, asset tokenization stands at the forefront of this innovation. According to a recent survey<sup>1</sup> of 271 institutional investors, there is significant enthusiasm for digital asset investments, with **88%** actively advancing their plans and **91%** expressing interest in investing in tokenized products.

This transformative phenomenon is anticipated to reshape both financial and non-financial markets within the next five to fifteen years, in contrast to earlier disruptive technologies such as radio, television, and email, which took three decades to achieve mainstream adoption<sup>2</sup>. Like other advances in financial technology, asset tokenization can enhance accessibility to investments and revolutionize the management of diverse asset classes, extending their reach to a broader spectrum of investor classes.

In view of these developments, this report aims to provide an extensive exploration of asset tokenization and the key drivers behind its rapid adoption, with a particular focus on real assets. It delves into the asset tokenization journey, spanning deal structuring, digitization, primary distribution, and management. Beyond the technological aspects, the report also examines the legal implications relevant at each stage.

During the research, interviews were conducted by KPMG in Singapore with industry specialists within the asset tokenization sector. These experts, hailing from both banking institutions and digital asset service providers, offered invaluable, first-hand insights into the prevailing trends and perspectives that are shaping the asset tokenization landscape.

Guided by the research findings, a C-suite decision framework for asset tokenization is also introduced with the aim of assisting C-level executives in harnessing the potential of this transformative technology. This tool offers essential guidance for asset owners and investors, covering important factors like legal considerations, technology choices, and potential risks, including data security and digital identity. The report also outlines the primary focus areas for decision-makers as they embark on their asset tokenization journey.

The subsequent sections of this report will explore the key themes of asset tokenization and are organized as follows:

1. An introduction to asset tokenization, digital asset taxonomy, and examples of tokenized assets
2. The market opportunity and potential benefits of tokenization
3. The asset tokenization process and specific case studies
4. The C-suite checklist and Company Decision Matrix
5. Adoption challenges, future outlook, and conversation excerpts with HSBC and SMBC
6. Conclusions

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<sup>1</sup> [Migration to Digital Assets Accelerate – BNY Melon](#)

<sup>2</sup> <https://business.bofa.com/content/dam/flagship/bank-of-america-institute/transformation/beyond-crypto-tokenization.pdf>

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# Introduction

## A Primer on Tokenization

Tokenization is the process of converting assets into a digital format and recording their ownership rights on a distributed ledger, typically a blockchain. This process extends beyond simple ownership records, allowing for the comprehensive documentation of asset attributes, characteristics, status, and transaction history. During the tokenization process, digital tokens are created to be associated with or represent various types of assets, including:

- Financial instruments such as debt or equity instruments, participation certificates, shares of collective investment schemes, or structured products
- Real assets, which encompass tangible, physical assets like gold, real estate, and art

Tokenization offers the capability to fractionalize these assets, enabling each token to correspond to a specific portion of the underlying asset. This feature marks a revolutionary shift in how assets are owned, transferred, and traded in the digital age.

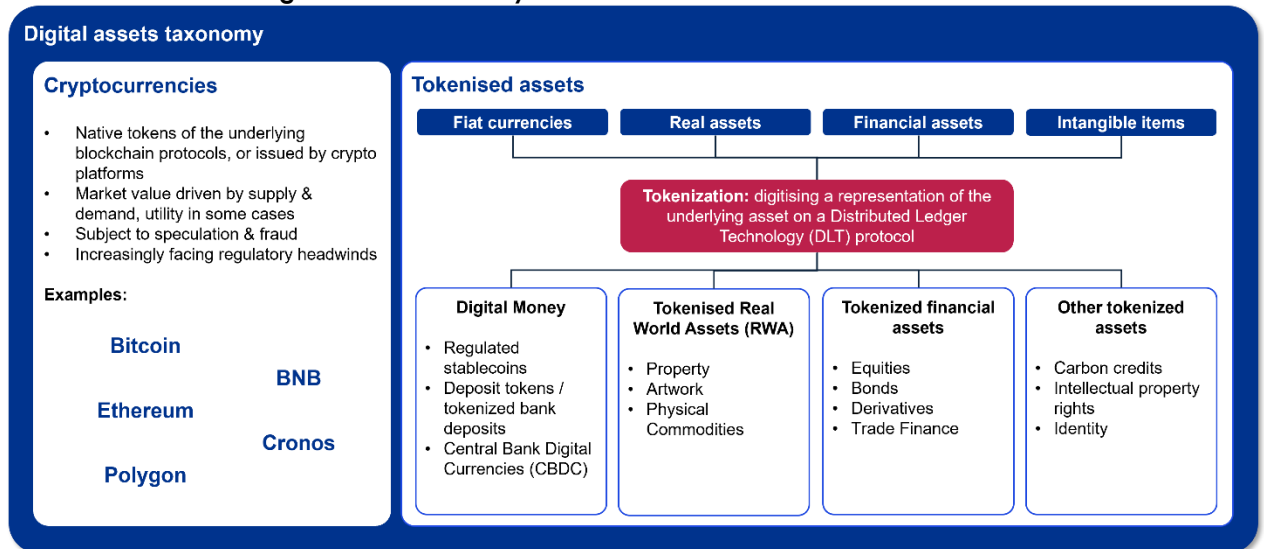
## The KPMG Digital Asset Taxonomy

Establishing a common lexicon with clear definitions is essential for reducing ambiguity within the digital asset landscape. For this purpose, KPMG in Singapore has introduced a digital asset taxonomy (refer to Exhibit 1 below) with the aim of fostering a shared understanding of terminology and promote consensus in definitions.

Within this exhibit, the term "Off-Chain Assets" (OCAs) is used to represent all tokenized assets that do not involve digital currencies or cryptocurrencies. This term is favored over "Real-World Assets" (RWA), a more common expression in the cryptocurrency ecosystem, for several reasons:

- **Specificity and Clarity** – "RWA" implies a connection to tangible assets in the 'real world', but it is often used to reference digital financial instruments like bonds and equities. In contrast, OCA offers a clearer definition that further categorizes these assets into familiar asset types, including Real Assets, Financial Assets, and Other Assets.
- **Avoiding Confusion** – The term "RWA" conflicts with important established terminology in traditional financial services - "Risk Weighted Assets" which signify the minimum amount of capital a financial institution must hold to in relation to the risk profile of its lending activities and other assets. This distinction is vital to prevent confusion.

• **Exhibit 1: KPMG's Digital Asset Taxonomy**



Source: KPMG in Singapore Research

**Real Asset Tokenization Examples**

Many of the newly announced tokenization projects reference a variety of asset types and classes, including agricultural commodities, gold, other precious metals, real estate, and a variety of financial securities. Exhibit 2 below provides an overview of the reference assets currently available in the market.

**Exhibit 2: Tokenization Examples with Reference Asset Characteristics**

Token Issuer	Token Name	Reference Asset	Reference Category	Redemption Option	On or Off-chain Asset
European Investment Bank	Bond-specific tokens	Bonds	Financial asset	No	On-chain
Onyx by J.P. Morgan	Repo security-specific tokens	Intraday repo	Financial asset	No	On and off-chain
Obligate	Bond-specific tokens	Corporate Bonds	Financial asset	No	On-chain
Franklin Templeton	BENJI	MMMF shares	Financial asset	Yes	On and off-chain
Tangible	Real USD	Real Estate	Real asset - Real estate	Yes	Off-chain
Tangible	Item specific Tangible NFTs (TNFTs)	Wine, gold, watches, or real estate	Real asset - Other	Yes	Off-chain
Paxos Trust Company	PAXG	1 fine Troy ounce of gold	Real asset - Commodity	Yes	Off-chain
TG Commodities Limited	TXAUT	1 fine Troy ounce of gold	Real asset - Commodity	Yes	Off-chain
Toucan Protocol	TCO2	Carbon credits	Real asset - Other	No	Off-chain
Centrifuge	DROP/TIN	Pools of reference assets	Multiple assets	Yes	Off-chain
Goldfinch	Pool-specific tokens	Pools of reference assets	Financial asset	Yes	Off-chain

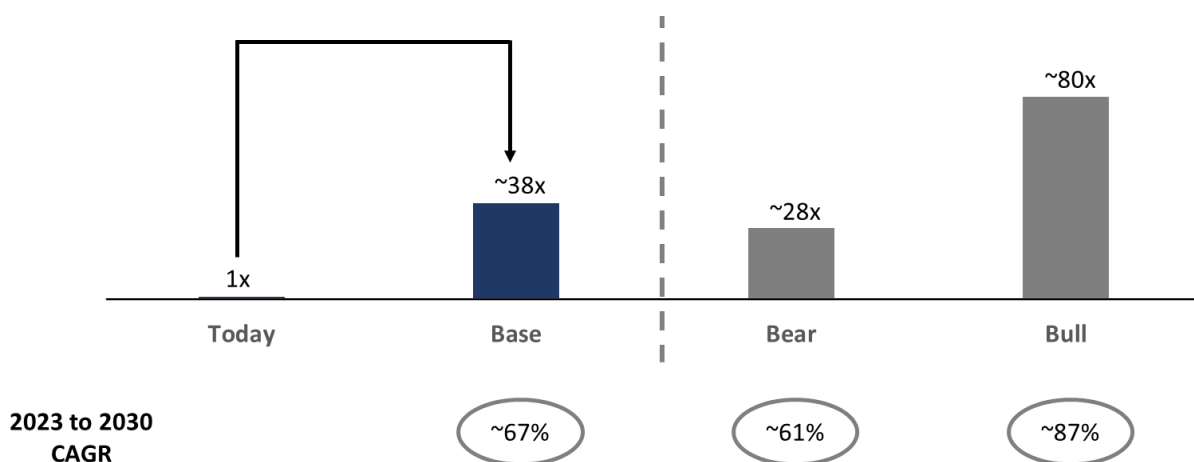
Source: [Federal Reserve: Tokenization: Overview and Financial Stability Implications](#)

# Why Tokenize?

## What is the Opportunity?

The potential to tokenize global illiquid assets, spanning across real estate, private equity, bonds, commodities, and financial assets, is **a multi-trillion-dollar opportunity**. Importantly, the 2030 forecasted market opportunity is expected to grow from 2023 baseline by at least **28x to 80x**. These forecasts support the considerable opportunities within the asset tokenization sector.

Exhibit 3: Forecasted market growth from 2023 to 2030



Source: 21co, ADDX/BCG, Citi, EY, KPMG Analysis

## Where are the Opportunities?

Exhibit 3 presents an analysis of the global tokenization landscape and key findings are as follows:

- **Singapore, Hong Kong (SAR), China, and Switzerland** are fast emerging as competitive hubs for asset tokenization. This evaluation is based on several key factors, namely Government Sponsorship, Legal Framework, Regulatory Environment, and Market Infrastructure.
- In comparison to other regions under consideration, regulators in Singapore, Hong Kong (**SAR**), **China**, and Switzerland have demonstrated a strong commitment to nurturing a competitive tokenization market. For instance, the Monetary Authority of Singapore (MAS) launched Project Guardian, a collaborative initiative with the financial industry aimed at testing the viability of blockchain technology for asset tokenization and decentralized finance (DeFi) applications.
- Most of the regions studied have made significant strides in developing regulatory frameworks. Singapore, Hong Kong (**SAR**), **China**, and Switzerland have shown remarkable proclivity in enhancing their market infrastructure to support tokenization, advancing the security token market, and facilitating greater accessibility, inclusivity, and efficiency in investment opportunities.

**Exhibit 3: KPMG's Regulatory Landscape Analysis for Tokenization (October 2023)**

Jurisdiction	Key Factors to Enable a Competitive Tokenization Market				Enabling Environment Rating
	Government Sponsorship	Legal Framework	Regulatory Environment	Market Infrastructure	
Singapore	Positive	In Progress	In Progress	Positive	Positive
USA	Negative	Negative	Negative	In Progress	Negative
UK	In Progress	In Progress	In Progress	In Progress	In Progress
Hong Kong S.A.R	Positive	In Progress	In Progress	Positive	Positive
EU	In Progress	Positive	In Progress	In Progress	In Progress
Switzerland	Positive	Positive	In Progress	Positive	Positive
UAE (Dubai)	In Progress	In Progress	In Progress	In Progress	In Progress

**Legend**

Positive



In Progress



Negative



Source: KPMG in Singapore Research

**Potential benefits of Tokenization**

The potential benefits collectively demonstrate how tokenization can serve as a transformative force, democratizing investment opportunities and streamlining asset management processes.

**1. Increased Efficiency and Reduced Costs**

The programmability of smart contracts allows for the automation and standardization of specific processes in the asset management lifecycle. These processes include compliance checks, investor credentials verification, and corporate actions like dividend distribution. Such automation significantly reduces administrative challenges arising from manual documentation and inconsistent record-keeping.

**2. Increased Transparency and Better Risk Management**

Blockchain-expedited settlement cuts down transaction risks, such as those from counterparties, additionally, blockchain transactions are both transparent and easily traceable, with every transaction getting logged facilitating auditing and heightening accountability. This greatly helps deter fraudulent activities and bolsters transactional integrity.

**3. Increased Market Liquidity**

The efficiencies achieved in tokenization open the markets to a broader audience of investors; by reducing prohibitively large minimum investment size, reducing geographic constraints and enabling more participants to take part, thereby increasing the overall volume and liquidity. In addition, tokenized assets also enable near instantaneous settlement, unlocking further liquidity and benefiting investors and traders alike.

**4. Increased Accessibility**

Tokenization revolutionizes accessibility by converting tangible and intangible assets into digital tokens on the blockchain, facilitating fractional ownership. This fractionalization means that high-value assets, traditionally available only to affluent investors due to hefty initial capital requirements, can now be broken down into smaller, more affordable units. As a result, a wider and more diverse group of investors can participate in the investment landscape, democratizing access, lowering barriers to entry





# Asset Tokenization Process

## The Asset Tokenization Process

Asset tokenization converts the ownership of various types of assets into digital tokens on blockchain. The lifecycle of a tokenized asset can be generally divided into five stages:

### 1. Deal Structuring

The initial stage entails the asset owner or issuer specifying the asset they intend to tokenize; this selection can span a diverse array of assets, from real estate, art, and precious metals to intellectual property, stocks, and commodities. During this first phase, the specific structure for tokenization is also defined, which may vary as the regulatory and legislative requirements may be different depending on whether the asset is classified as a security, a commodity or other. This is the stage at which the vital decisions about the token's legal wrapper are made.

### 2. Digitization

During the Digitization phase, the tangible asset is first immobilized by transferring it to a controlled structure or location, usually under the care of a qualified custodian or a certified trust company. Following this, a digital “twin” of the asset is written on the blockchain as a token, using a specific tokenization standard. Central to this process is the creation of a digital Register of Members (ROM) for the chosen asset, which details the current individuals invested in the token. The ROM is then uploaded to the blockchain, serving as a comprehensive ownership record.

### 3. Primary Market

In the Primary Market phase, tokens are offered to investors in return for their investment capital, at which point the details of these investors are recorded in the digital ROM. These digital assets can be passed on to the end investors through traditional methods, such as financial institutions, and brokers, or newer avenues, such as digital-asset exchanges. To store the digital asset, the investor, or their representative, must first establish a digital wallet, meanwhile any corresponding physical asset remains immobilized in the collective issuer account with the traditional custodian. Often, this stage involves a distributor to facilitate the movement of the digital assets.

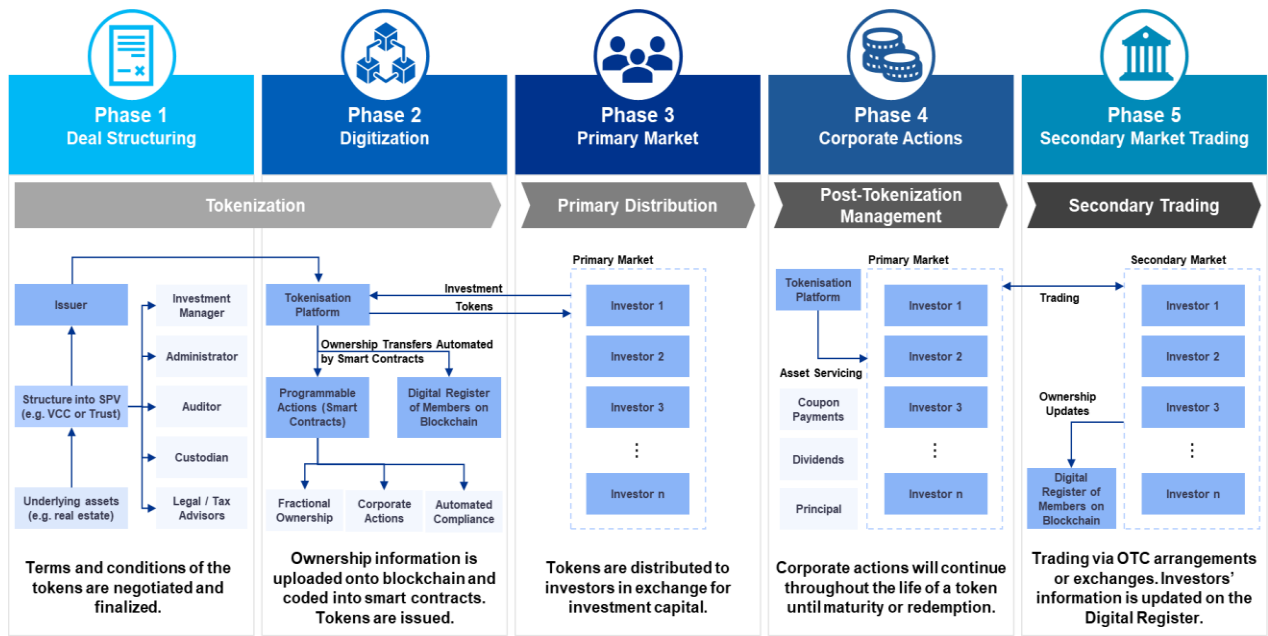
### 4. Corporate Actions

Once a digital asset reaches its end investor, it requires consistent servicing, this includes adhering to regulatory, tax, and accounting reports, periodically determining the net asset value (NAV), and executing corporate actions such as dividend distributions and facilitating shareholder voting; these functions can mostly be automated through smart contracts embedded within the token. This post-tokenization management persists for the token's entire lifespan, up until its maturity or redemption.

### 5. Secondary Market Trading

The culmination stage, which leverages asset tokenization's strength in amplifying liquidity, is secondary trading; here, a token holder can exchange tokens with another investor either directly or on an exchange platform. Depending on the issuing entity and the asset type, the owner might engage a secondary trading platform — such as an alternative trading system (ATS) — to enable a fluid market for these tokenized assets after their introduction.

### Exhibit 5: Asset Tokenization Process



Source: KPMG in Singapore Research, Real Estate Tokenization Paper



## Case Studies for Tokenization of Real Assets

The landscape for asset tokenization is nascent, but diverse and multifaceted, covering a wide range of asset types. Below are three case studies on tokenizing Real Assets, covering Real Estate and Art & Collectables:

### Real Estate

Real estate tokenization has transformed property investment by introducing fractional ownership, democratizing investor access, and greatly enhancing liquidity. Before this innovation, real estate investment came with high barriers to entry, intricate procedures, and limited liquidity. Tokenizing real estate assets, however, can make property investments more accessible and economical. Now, investors can buy pieces of properties, opening more chances for retail investors to delve into real estate markets. Additionally, tokenization creates a more fluid market, supports real-time trading, and boosts overall market efficiencies.



#### Case Study #1: CitaDAO tokenizes real estate in Singapore

CitaDAO tokenized two strata-titled industrial units at Block 18 and 20 at Midview City in Sin Ming, Singapore worth over US \$1.2 million between 2022 and 2023. When a property is listed on the CitaDAO platform, interested users can express their commitment. Once sufficient commitment is secured, a special purpose vehicle (SPV) will purchase the building and participants will receive real-estate tokens. Users who hold at least 30 percent of the tokens have the rights to initiate a buyout process to redeem the underlying title deed and all assets of the SPV. The platform, which is built on the Ethereum blockchain, allows anyone to trade or provide liquidity to the tokenized real estate via decentralized exchanges.

The main benefit to issuers is liquidity, with the approach successfully attracting about US \$400,000 liquidity (~67% of the asset value) for the tokenized 20 Sin Ming Lane real estate. As a result, CitaDAO brought liquidity to a traditionally illiquid asset class, showcasing the effective use of blockchain technology in revolutionizing the real estate industry.

### Key Takeaway:

Tokenization of real estate assets brings liquidity to traditionally illiquid markets, showcasing the transformative potential of blockchain technology in the real estate industry.



## Art & Collectibles

Tokenization is revolutionizing the art and collectibles industry, creating new ways for enthusiasts and investors to interact with valuable artworks. For instance, tokenizing famous paintings has opened the art market to more people; beyond just paintings, other items such as trading cards, wine, stamps, and watches are also being tokenized. Tokenization makes buying, selling, and trading these items simpler, it efficiently creates digital authenticity certificates, ensuring easy verification of an item's origin and reducing counterfeits.

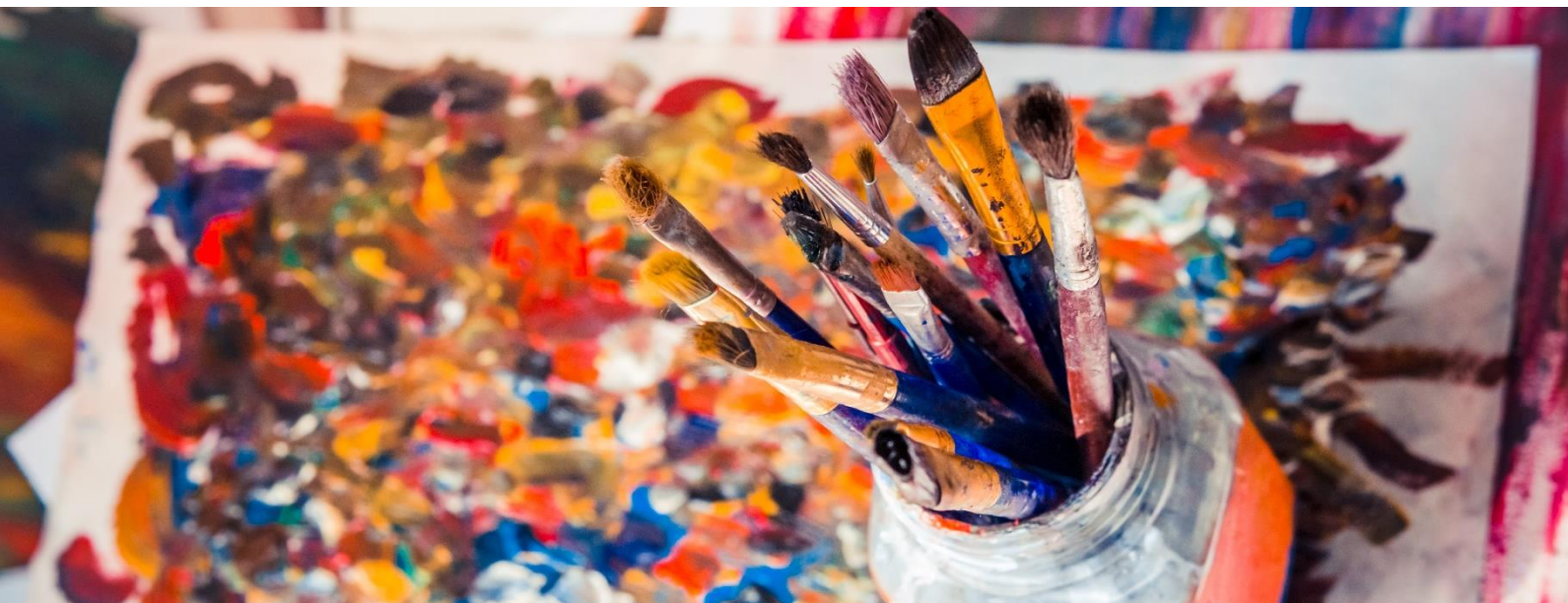
### Case Study #2: InvestaX tokenized Bored Ape #2371 (Art Collectable)

InvestaX made a strategic acquisition by purchasing Bored Ape #2371, a premium NFT from the highly coveted Bored Ape Yacht Club (BAYC) collection. Taking their innovation further, InvestaX has tokenized the economic interests of this NFT, introducing it under the ticker symbol IXAPE. This move allowed the broader community to share in the ownership and underscores InvestaX's commitment to fostering innovation in the digital asset space. What sets this apart is InvestaX's status as a licensed platform, allowing for regulatorily compliant issuance and trading of digital asset securities or security tokens. Token holders not only have the assurance that their assets are legally recognized as securities but can also benefit from potential economic gains and the utilities linked to the token.

The main benefit to issuers of this NFT is increasing accessibility of their assets to a wider pool of investors because they have reduced the ticket size for exposure. Hence fractionalization of such an asset provides them with a wider pool of investors to sell it to.

### Key Takeaway:

Tokenization extends beyond physical assets to include premium NFTs, offering broader ownership opportunities in the digital asset space.



### Case Study #3: Wine-Based Asset-Backed Security Listing on Alta Exchange

Alta collaborated with PhillipCapital to introduce a novel way to invest in wine using the En Primeur tokens (EP) on its licensed exchange platform in Singapore. These tokens represent future bottles of select 2020 Bordeaux wines, including renowned names like Lafite Rothschild and Haut-Brion. Each token is linked to a parcel of 36 bottles across 16 wine labels. Investors can trade these digital tokens or wait to either collect the actual wine bottles or be paid from their sale upon the maturity of the secured notes in 2026. This idea brings together the world of fine wines and digital securities, allowing both wine lovers and investors to benefit. Alta's previous success with whisky shows their strength in combining alternative investments with modern technology.

Issuers are now able to provide transparency for ownership of these wines, giving comfort to the investors that they are owning actual wine bottles that can be collected upon the maturity of the secured notes. This will allow them to attract a wider pool of interested investors.

#### Key Takeaway:

Tokenization harmonizes traditional investments with modern technology, making assets like fine wines more accessible, tradable, and appealing to a diverse investor base.



# C-Suite Decision Framework

KPMG in Singapore has developed a 6-point checklist for C-suite executives as shown in Exhibit 6 below. This tool is intended to assist them in navigating the complex landscape of asset tokenization. The checklist comprises two main components:

- The first component involves a Company Decision Matrix centered around four key themes; these themes are then further broken down into nine specific parts. To make an informed decision on an asset tokenization project, C-suite executives will need to collaborate closely with their core strategy team to evaluate the information required for the Decision Matrix thoroughly.
- The second component focuses on the task of assembling the right team; this encompasses a blend of internal and external stakeholders who can offer the requisite guidance and expertise to adeptly pursue the opportunities presented by asset tokenization.

## The C-Suite Checklist

This checklist is designed to serve as a useful resource for decision making before embarking on an asset tokenization project. A positive affirmation across all checklist items serves as a strong indicator of the initiative's viability and potential success.

### Exhibit 6: C-Suite Checklist

KPMG Company Decision Matrix	<input checked="" type="checkbox"/>	<b>Desirability - Are there clients willing to pay for it?</b> Identified clients that are willing to pay for this service
	<input checked="" type="checkbox"/>	<b>Viability - Does the business case make sense?</b> The cost-benefit analysis is done and it will contribute to a positive ROI for the company
	<input checked="" type="checkbox"/>	<b>Feasibility - Can we build it and will it work?</b> We have identified the necessary expertise to build the product to sell
	<input checked="" type="checkbox"/>	<b>Resilience - Will it last?</b> Right frameworks are in place to ensure robust operational and technical resilience
-----		
Building the right team	<input checked="" type="checkbox"/>	<b>Professional Support - Do I have the right support?</b> I have professional support (e.g. law, consulting firms) that are knowledgeable about tokenization
	<input checked="" type="checkbox"/>	<b>Internal Expertise - What does my team say?</b> My team supports and have the right expertise to create this new revenue stream

Source: KPMG in Singapore (RC) Research

## KPMG's Company Decision Matrix for Asset Tokenization

By exploring these four critical dimensions, organizations can make informed choices and navigate the complexities of tokenizing various assets, while ensuring alignment with strategic goals and regulatory compliance.

### 1. Desirability

#### a. Market Demand

Assessing the market demand for tokenization is important to assess desirability of the tokenization initiative. This can be done via a market study with prospective investors and relevant industry stakeholders. This study should examine stakeholder's understanding of tokenized assets, their level of interest in this investment avenue, and any reservations they might have. This data collection should also gather information on expected impact of tokenization. In addition, it is crucial to analyze data obtained from existing tokenization platforms. These data sources offer invaluable insights into user growth trends and transaction volumes.

#### b. Partnerships & Ecosystem

Evaluating partnerships & ecosystem is critical in equipping the organization with the right tools to collaborate with key stakeholders. This process starts with the identification of strategic partners in the domain, which ranges from blockchain solution providers to regulatory authorities.

The organization can also learn from other existing collaborations models in the market to understand best practices. These existing collaboration models can inform how organizations can best collaborate with their identified partners.

### 2. Viability

#### a. Strategic Alignment

Organizations should assess the compatibility of asset tokenization with their broader strategic objectives and determine its significance. This entails a thorough examination of whether tokenization provides a competitive advantage, introduces new revenue streams, or enhances the overall customer experience. Importantly, this decision should not only cater to immediate requirements but also enhance the company's long-term vision and trajectory.


#### b. Asset Suitability & Valuation

Organizations should carefully evaluate their asset portfolio to identify assets that are best suited for tokenization. This assessment should consider factors such as liquidity, valuation, and potential investor interest.

Additionally, organizations should exercise due diligence by engaging professional appraisers and auditors. Their expertise is essential in conducting valuation assessments, determining the true value of assets, confirming ownership rights, and identifying any potential risks or encumbrances. These rigorous procedures not only serve to establish transparency but help to instill confidence among token investors.

#### c. Legal & Regulatory Outlook

Tokenization can introduce a range of new regulatory complexities, including considerations related to securities laws, anti-money laundering (AML) guidelines, and investor protections. Furthermore, the regulations governing digital assets can vary



widely, with different nations and jurisdictions adopting unique regulatory approaches. This diverse regulatory landscape can create significant uncertainty for both businesses and investors, making navigation and compliance a considerable challenge. Therefore, collaboration with legal professionals who can provide the necessary guidance and expertise in navigating this intricate regulatory terrain is crucial to ensure compliance with the diverse regulations.

### **3. Feasibility**

#### **a. Technology Infrastructure**

To ensure readiness for asset tokenization, organizations should undertake a comprehensive evaluation of their technological capabilities and ensure they have built the capabilities to support tokenization. These capabilities include trading, custody, lending, collateral management, fund administration, asset servicing, settlement, accounting, and payments.

Organizations should also deliberate whether to build, partner, or buy these capabilities. Key considerations should revolve around determining if they possess the necessary infrastructure, expertise, and security measures for a successful integration of blockchain technology.

#### **b. Interoperability**

Interoperability is the capability of the chosen tokenization platform and protocol to operate seamlessly across various computing environments. It is an important consideration as it directly influences liquidity and market accessibility of the tokenized asset.

As the features of different tokenization platforms and protocols can vary considerably, it is important to consider the compatibility of the tokens that are issued with other blockchain infrastructures and trading platforms when engaging in asset tokenization.

### **4. Resilience**

#### **a. Risk Management**

In devising a risk management framework for tokenization, several key components need to be addressed. A focus on managing vulnerabilities is vital, as it plays a central role in safeguarding against potential breaches or malfunctions.

Operational risks, ranging from system glitches to human errors, should be identified, considered, and mitigated. Additionally, the potential risks associated with counterparties, especially in the context of interactions with third-party platforms or intermediaries, must be subjected to thorough assessment.

#### **b. Data Security & Privacy**

Digital assets are susceptible to risks like hacking and theft, which can lead to substantial losses for investors. Consequently, regulators are paying heightened attention to digital asset security and the required protective measures that businesses need to establish to ensure consumer protection.

As tokenization involves the handling of sensitive data and financial transactions, organizations need to implement robust security protocols to guard against data breaches, hacking attempts, and fraudulent activities.



# The Tokenization Adoption Journey

## Asset Tokenization Adoption Challenge

The adoption of tokenization for OCAs in businesses across various industries introduces four primary challenges, as illustrated in Exhibit 7 below.

Exhibit 7: Four key adoption challenges for asset tokenization



Source: KPMG in Singapore Research

### 1. Regulatory Complexity

Companies need to manage multiple sets of rules when operating within different jurisdictions due to the diversity in regulations. These regulations span across several aspects including: Know Your Customer (KYC), Know Your Business (KYB), Counter-Terrorism Financing (CFT) procedures, investor protections, and lending practices.

### 2. Uncertain Legal Claims

Blockchains are useful for enforcing on-chain asset transfers and contracts for blockchain-native assets. However, the enforcement of tokenized OCAs necessitates off-chain mechanisms, which fundamentally depend on social norms, legal systems, and judicial processes.

### 3. Technical Challenges

The varying technical standards governing different blockchain ecosystems give rise to potential interoperability issues. The current landscape faces challenges related to asset and platform standardization. These challenges include variations in how assets are represented, management of user identity, and ownership structure.

#### 4. Trust Deficit

A notable lack of trust concerning the verification of participants and transactions is evident among institutions. The procedures for checking and verifying customers' identities are not digitally streamlined and are duplicated across institutions. On-chain (decentralized) identity plays an important role to facilitate compliance with KYC/KYB regulations but there is still limited meaningful adoption in the market.

### The Future Outlook for Asset Tokenization

Despite the challenges described above, the outlook for tokenizing OCAs remains highly promising. The industry is addressing these challenges, which include:

#### 1. Increasing Regulatory Clarity around the World

Regulatory authorities are progressively offering clearer guidance on digital assets, aiming to fill gaps in existing legislation. For instance, the Australian government has proposed incorporating digital asset platforms and other intermediaries into the existing financial services regulatory framework through the creation of a new financial product known as a Digital Asset Facility.

#### 2. Addressing Uncertain Legal Claims

New instances of legal guidance and precedents are surfacing in courts worldwide. For example, the UK's Law Commission has released comprehensive guidance on the legal treatment of digital assets and proposed a third method for recognizing digital properties. In Singapore, several legal precedents have also been established in cases concerning legal claims related to digital assets.

#### 3. Convergence of Technical Standards

Technical standards and implementations are increasingly converging. A notable example is the World Wide Web Consortium (W3C), which recommended the Decentralized Identity Standards (DID) in June 2022. Additionally, technical standard bodies like the International Organization for Standardization (ISO) and the National Institute of Standards and Technology (NIST) are issuing technical recommendations on the implementation of digital asset issuance.

#### 4. Setting the Stage for Adoption of Decentralized Identity

Governments worldwide are actively establishing frameworks and regulations related to decentralized identity. Notably, the UK government is in the process of developing a novel digital identity framework that empowers users to have control over their data and determine how it is shared.

In Europe, similar initiatives are taking place, with governments exploring the potential of SSI to enhance digital identity services across the EU. The EU Commission has providing funding for several research projects in this domain.

### Expert perspectives on the Tokenization Adoption Journey

As a key trust anchor in the economy, Banks play a key role in driving the adoption of tokenization. Depending on the asset being tokenized, banks can play the role of an issuer, distributor, or custodian for their clients. Hence, it is natural that KPMG professionals also reached out to tokenization experts from banks to validate our thesis on the promise of tokenization. Below are two interviews with experts from HSBC and SMBC on their insights on tokenization, its promise and what is required for large scale adoption.

## A conversation with Rajeev Tummala,

## Head of Digital & Data for Asia and MENA, HSBC

**Question: What are the top 3 areas that you think tokenized assets will have the greatest impact and why?**

**Firstly, there will be a significant shift on how institutions are participating in this space.** Digital assets are being treated as a distinct asset class and this signals a broader transformation in how we represent and manage assets. However, with the advent of blockchain and digital assets, this conventional framework is giving way to programmable assets. While fundamental functions of assets like liquidity provision, remains unchanged, the way they are fulfilled is undergoing substantial changes. Institutions are exploring new economic models, such as DeFi-inspired liquidity pools, tailored to different types of assets, emphasizing the next evolution of asset management.

**Secondly, assets will become easier to own.** Historically, paper-based assets were restricted to a limited number of issuers and owners. The introduction of electronic assets broadened access, reducing settlement times from T+7 to T+1. With the emergence of digital assets, democratization of ownership is set to expand even further. However, this newfound accessibility brings forth questions of asset quality. Distinguishing between good and poor assets becomes paramount, leading to the emergence of roles for curators who can provide expertise in asset selection and evaluation.

**Finally, new roles and niches are also emerging.** The representation of physical assets as digital twins on blockchains necessitates trust anchors to verify their presence, while specialist custodians with expertise in specific asset classes are gaining prominence. These developments highlight the dynamic nature of the digital asset ecosystem, where new roles and specializations are shaping the industry. We are also observing multiple network types (enterprise-only, private, public) emerging. The potential lies in these networks eventually establishing connections and interoperability to benefit participants.

**Question: In your view, what are the main hurdles to scaling adoption of blockchain and tokenized assets and how should we address them?**

Adoption of blockchain technology in financial markets faces several challenges.

One of the primary hurdles is the **diversity in the maturity levels of market participants**. Different players are at various stages of understanding and implementing blockchain solutions, making it challenging to establish a unified approach.

**Furthermore, the value proposition of blockchain in post-trade operations is significant but can vary depending on specific use cases and risk profiles.** For example, if an internal custody system is blockchain-based, it opens the door for streamlining post-trade activities through smart contracts, such as dividend distribution. However, these efficiencies often target internal operations before extending to the final leg of the transaction lifecycle involving external client interactions.

**To drive blockchain adoption, regulatory support becomes crucial.** The regulatory landscape needs to evolve and adapt to accommodate blockchain technology and its applications in financial markets. Achieving this transformation will undoubtedly take time, given the complexity of the financial ecosystem and the various stakeholders involved. Nevertheless, the collaboration and experimentation happening within the ecosystem signal a growing consensus on the direction forward.



## A conversation with Thaddaeus Lee, Executive Director, Asia Innovation Centre, SMBC

**Question: What are the greatest impacts on economic activities through tokenization?**

**Firstly, asset tokenization holds significant potential in various areas, particularly in supporting small and medium-sized enterprises (SMEs) and private debt/liquidity markets.** This technology is particularly well-suited for markets characterized by limited liquidity and multiple intermediaries. Examples include SME and start-up equity and debt financing, private placements of non-listed securities, participation in private limited liability companies, and tokenization of private equity or venture capital funds. These segments stand to benefit from the broader adoption of asset tokenization, as it can streamline processes, reduce costs, and increase access to capital for businesses in need.

**Secondly, the potential to promote sustainability for institutions is also extremely compelling.** This is especially evident in three key aspects:

1. **Fractional Ownership and Access:** Asset tokenization democratizes access to sustainable projects that were traditionally accessible only to institutional investors. This breakthrough allows individuals to invest in sustainable initiatives with lower barriers to entry, fostering a broader commitment to environmental and social responsibility.
2. **Enhanced Liquidity:** Tokenization addresses the historical problem of illiquidity in certain assets. By representing ownership through digital tokens, it enhances liquidity, enabling investors to buy, sell, and trade assets more readily. This increased liquidity offers opportunities for diversification, portfolio management, and efficient exit strategies, ultimately strengthening the sustainable investing landscape.
3. **Transparency and Traceability:** Blockchain technology, which is integral to asset tokenization, ensures transparent and auditable records of asset ownership and transactions. This transparency not only builds trust among investors but also enables the tracking of sustainable practices and their impact, reinforcing accountability and responsible investing.

Use cases of asset tokenization in sustainable investing includes:

1. **Renewable Energy Projects:** Tokenizing renewable energy infrastructure, such as solar farms, wind parks, or hydroelectric plants, empowers investors to contribute to clean energy initiatives while generating financial returns from power generation.
2. **Carbon Credits and Offsetting:** Tokenizing carbon credits enables individuals and organizations to participate in carbon offsetting projects, supporting efforts to reduce greenhouse gas emissions.
3. **Sustainable Real Estate:** The tokenization of environmentally conscious real estate, including green buildings and eco-friendly developments, provides investment opportunities that promote energy efficiency and sustainable urban development.



**Question: What are some of the key challenges you see facing the industry in adoption of tokenization of assets?**

**Blockchain technology remains unfamiliar territory for numerous businesses.** The new economic models introduced by decentralized protocols can be daunting, deterring many enterprises from venturing into the development of their digital asset services. These complexities often act as a barrier to entry, slowing down the adoption of blockchain solutions in the corporate landscape.

**One significant challenge facing the widespread adoption of digital assets relates to trust and infrastructure.** The current infrastructure for securely storing digital assets is not yet mature enough to facilitate mass adoption. Custodial solutions, reliable payment rails, and robust security measures must be developed further to instil confidence in users and businesses looking to embrace digital assets.

**Additionally, achieving widespread adoption requires addressing the issue of interoperability.** Different participants in the securities market are moving at varying speeds towards blockchain integration, necessitating the coexistence of tokenized assets with traditional ones for the foreseeable future. Hence, enabling seamless communication and interoperability between participants, systems (both traditional and new), and on-chain and off-chain markets during the transaction lifecycle of tokenized assets becomes a critical focus for the industry.

**Question: What do you think are the signals of increasing adoption?**

**Firstly, we no longer see projects obtain funding based on hype, with prerequisites for funding now including sound economic foundation and a robust business case.** Venture capitalists are increasingly prioritizing return on investment (ROI) and the presence of a clear business case. Consequently, the convergence of Liquidity, Utility, Equity, and Governance has become imperative, forming a comprehensive framework for evaluating the viability of blockchain-based projects.

**Secondly, buzzwords like NFTs, Blockchain, and Web 3.0 are likely to fade into obscurity as these technologies mature and become integrated into everyday life.** Much like DNS and HTTP, the focus will shift from buzz phrases to useability and use cases that solves a specific business problem, where the practical application of these technologies will take precedence.

**Finally, we'll start to see use cases emerge consequently from the proliferation of AI.** AI will enable Web 3.0 to scale as it gives computers the ability to understand context of user request and can answer complex request more quickly. In addition, we'll see Web 3.0 act as a natural technology guardrail and provide the ability for users to own, control, and verify their own data in a world increasingly filled with AI-generated content and data.



# Conclusions

This report first introduces the concept of asset tokenization, providing a taxonomy as well as examples of the type of assets that can be tokenized. It then proceeds to outline various factors contributing to the proliferation of asset tokenization, including operational efficiencies, reduced transaction costs, and the potential for new business models.

An overview on the process of Asset Tokenization is detailed, which can be broken down into 5 phases, which are (1) Deal Structuring (2) Digitization (3) Primary Market (4) Corporate Actions (5) Secondary Market Trading. These are general processes that can be applied across different asset tokenization initiatives, with case studies presented to outline the variety of asset classes.

This report subsequently provides a C-Suite checklist for those considering asset tokenization:

1. Desirability - Are there clients willing to pay for it?
2. Viability - Does the business case make sense?
3. Feasibility - Can we build it, and will it work?
4. Resilience - Will it last?
5. Professional Support – Do I have the right support?
6. Internal Expertise – What does my team say?

Finally, 4 key adoption challenges for asset tokenization are presented for C-suite consideration:

(1) Regulatory Complexity (2) Uncertain Legal Claims (3) Technical Challenges (4) Trust Deficit. However, complex these may seem, we remain positive and find increasing activities among market participants and regulators to resolve some of these challenges.

As we look towards the future, it becomes clear that asset tokenization is not merely a technological innovation but a paradigmatic shift in asset management and ownership within our increasingly digitised world. We continue to be optimistic and believe the future looks bright for asset tokenization.

# More information on KPMG in Singapore's work on Fintech and Blockchain below



## *Pulse of Fintech: H1'23*

In H1 2023, the global fintech sector faced numerous challenges, from rising inflation and geopolitical tensions to reduced funding and deal numbers. Despite these setbacks, certain regions like the Americas and specific subsectors such as logistics-focused and ESG-focused fintech experienced growth. Investor sentiment remained cautious but selectively optimistic, particularly towards emerging technologies like generative AI.



## *Rules to Power a Stablecoin Driven Economy*

The Elevandi Insights Forum convened global experts to discuss the impact of digital currencies like stablecoins and CBDCs. The panel highlighted the need for regulation, risk management, and cross-sector collaboration. Benefits such as financial inclusion and efficient remittances were acknowledged, while trust and consumer protection were identified as key priorities.



## *What Boards Should Know Before Going Crypto*

In just 14 years, Bitcoin has evolved from a niche offering to a significant financial asset, leveraging blockchain technology for decentralization. While it's increasingly accepted by mainstream institutions, regulatory uncertainties make traditional players cautious. Institutional interest remains strong for future investment in digital assets.

# More information on SFA's extensive work on Fintech and Blockchain below



## *FinTech's State of Play*

Following extensive efforts and initiatives by policymakers and regulators, FinTech in Singapore has progressed substantially from its initial days. Fast-forward to today, Singapore in 2022 remains an open and global FinTech centre, with the country hosting both locally and internationally headquartered FinTech firms.



## *FinTech Innovation in Singapore*

FinTech innovation has continued to grow and evolve, especially in Southeast Asia where investments hit US\$4.3 billion in the first nine months of 2022, higher than the combined sum from 2018 to 2020. Yet, FinTechs are grappling with increasing pressures relating to trust and security while navigating a lack of regulatory clarity in areas such as Web 3.0 and artificial intelligence (AI). This report offers insights based on research and fresh interviews with FinTechs in Singapore



## *Decentralize Finance: A Future Where It Could Integrate with Traditional Finance*

This report on DeFi, produced in partnership with Smartkarma, offers a distilled but comprehensive, jargon-free overview of the DeFi space and explores how DeFi can positively impact our traditional, centralised financial system



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