



Trusted Tokenization

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This paper provides an overview of tokenization in the Sweetbridge platform. For information on the tokenization of assets see our paper on Trusted Tokenized Assets. For information on the tokenization of rights see our paper on Trusted Tokenized Rights.

Summary

The Sweetbridge Synchronized Accounting platform provides real-time auditing of controls with full transparency of legal and accounting details. This opens up the opportunity to create tokenized real-world assets and rights that can be trusted. Such a system represents more than efficiency, it unlocks the ability to create new value. Similar to how the derivatives markets have enabled the creation of value in the 100's of trillions of dollars, the ability to tokenize assets and rights opens up the opportunity to create multiples of the value of the underlying assets, goods, and services.

For digital tokenization to gain widespread adoption, the resulting token system must be trusted as much or more than the existing paper based or intermediary based systems used today. It must be easier to use, offer all the features required to ensure government requirements are met, provide users with protection from error, fraud, or loss, and in doing so create higher levels of trust. It does not need to be perfect — simply better than processes used today.

Creating a system that is better than today's systems, while still ensuring a high level of trust, can't be accomplished by technology alone. It requires trusted actors, insurance against risk, compliance enforcement, lawyers, accountants, and the auditing of claims and information. What is needed is a common technical framework for the real world actors today to create tokenized assets and rights. Sweetbridge has spent years designing and building a system which allows these actors to leverage what they already know how to do while increasing trust.

At the core of the Sweetbridge platform is a synchronized accounting system that ensures agreements are met, accounting and assets are audited, and regulations are followed. This system is designed to make tokenization of assets and rights both easy and safe because it can be audited in real time or verified by independent parties. This type of system would not realistically be possible without the continuous assurance features found at the core of the Sweetbridge Synchronized Accounting platform. The system ensures that all counterparties have compatible accounting treatments and have digitally signed the transactions. It provides controls that enable the real-time auditing of legal, regulatory, and accounting treatments.

The tokenization of assets has received a lot of hype. Most of the claims and proposals in the market today are more aspirational than practical. Many projects and entities talk about a piece of the puzzle, but few are examples of a holistic system of thinking. What has been missing is a set of tools specifically designed to allow the rapid creation of contracts by lawyers, of accounting treatments by accountants, of control verifications by auditors, of risk management by insurance companies and compliance officers all within a platform that supports regulatory compliance to ensure the ownership and value of the tokenized assets and rights can be trusted.

The Sweetbridge Tokenized Asset and Rights protocol has been designed to address these gaps and provides a complete solution for tokenization of real-world assets and rights with built in controls that allow tokens to be audited in real time. It is built from the ground up for GRC

(Governance, Risk, and Compliance) and to ensure continuous assurance that agreements, regulations, and workflows are followed. With real-time auditing of financial transactions and the verification of assets to minimize risk, it is now possible to tokenize anything.

What is tokenization?

Tokenization is the use of a digital record to represent the right to something. Sometimes that right is the right to:

- the ownership of something,
- the right to do something, or
- the right to goods or services.

Having something that represents the ownership of an asset or right is not new. Tickets to a play or sporting event are forms of paper-based tokens. These represent a right to admission. Titles on a home or vehicle are also a form of token that represent ownership of the asset. Even a cheque you write to someone is a form of token that represents a right to cash in your bank account.

Electronic tokens are not new. Apps exist for electronic tickets to conferences and theaters. Tokenization makes these tradable with other parties. A token to a theater could simply be transferred to another party or put on an exchange for someone to buy.

Tokenization gives us the ability to convert these older forms of rights into a digital asset that can be transferred without intermediaries. It also allows the right or asset to be divided between multiple owners with little effort and cost. Obviously you would not want to have multiple owners for a theater ticket but you might want to do this with gold.

A token can be fungible, meaning it represents a unit of something like gold, or it can be distinct, such as a specific car. Assets can be tangible, like inventory, or they can be intangible, like a patent.

A token can also represent a right to something created by a contract such as a right to use a property provided in a lease. In this document, we use the term “ownership” to mean the right created by law and the term “right” for rights created by contract or agreement.

In all of our papers, when we talk about tokens we mean a wider range of solutions than simply blockchain ledger units. By tokens we mean digital monikers that represent digitized information regardless of whether it’s represented on a blockchain or not. The Sweetbridge Synchronized Accounting protocol supports both on-chain and off-chain tokens — the reason to use one versus the other depends on the use case.

Tokenization benefits

Tokens can be used to transfer 100% of the ownership of something or a fraction of the ownership. To function, a tokenized system must prevent two parties from owning the same thing at the same time. Token transfers must be atomic transactions. This means that each transaction is an indivisible and irreducible series of persisted state changes such that all occur or nothing occurs. This is needed to prevent inconsistency between things such as the legal state, accounting state, and payment state. The Sweetbridge platform uses atomic transactions to prevent the steps in the transfer from being out of sync with each other.

The workflow needed to transfer ownership can be simple or it can be complex. For example, transferring the ownership of a piece of real estate is complex. That's why, today, we use escrow agents or lawyers when transferring real property. These financial intermediaries provide trust that all required actions have occurred.

Tokenized transfers of ownership must also ensure that required actions occur. These transfers must provide an audit trail in order to perform the same actions as a financial intermediary today. The difference is that tokenized transfers of ownership can occur without reliance on human intervention. The result is the ability to transfer the ownership to something like a piece of real estate in seconds, not weeks or months.

The Sweetbridge platform makes it possible to do what cannot be done in paper-based systems today; it can enforce behavior on the transfer of digital tokens. For example, today sporting venues typically try to prevent unauthorized trading and selling of sporting event tickets. A major reason for this is that the sports venue wants to trap the value created by more demand than supply of seats. Also, a person buying the ticket from someone else may actually buy a counterfeit ticket.

A token in the Sweetbridge platform can be used to solve both of these problems. Every time the token is traded it can enforce behavior. Therefore, if the ticket in our example is sold for more money than its original purchase from the issuer, a fee can be charged on a percentage of the increase in price. As the token is transferred, the fee is automatically paid or it won't transfer. The sports venue then starts to participate in the value created by a secondary market. The buyer can also use the token to determine if the ticket is genuine making a purchase from a secondary market safer.

Tokens are minted not mined

Unlike cryptocurrencies like Bitcoin or Ether, real-world assets are not mined, their tokens are minted. Like fiat currency minting, the process for creating the token must be verified and audited. Otherwise, it would be simple to create more tokens for assets than there are assets backing the token.

When we talk about tokenization of assets or rights we mean the creation of tokens to represent:

- A real world asset,
- A quantity of a real world fungible asset like a barrel of oil, or
- A right on an asset, good, or service.

A paper document that provides rights must be audited or verified to be trusted. The same is true for the creation of tokens. For tokens to be trusted, the processes and entities that mint them must be trusted. For tokenization to be adopted at any scale, it is critical that controls and risk mitigation exist. They provide assurance that what a token represents is real.

The Sweetbridge platform is designed to provide the infrastructure, controls, and verification processes that make tokenization trustworthy. However, the risk of error or fraud in tokenization can't be solved with technology alone. It must be solved using lawyers, auditors, custodians, insurers, counterparties, and regulators. The good news is these functions already exist in today's economy. The Sweetbridge platform is designed to provide the tools these parties need to tokenize assets and rights or validate claims.

Tokenization of assets

What you must do to successfully create a trustworthy tokenized asset varies depending on the type of asset. The goal of any tokenization process should not be perfection. Tokenization will be most successful if success is measured by the process's ability to produce something that can be proven to be as good or better than the process today.

Tokenizing different types of assets requires different intermediaries, processes, and audits. Tokenizing a tangible asset is different than tokenizing an intangible asset. The Sweetbridge platform breaks assets down into various types and forms with different features to support the unique issues faced with the tokenization of each asset type.

The platform¹ deals with:

- Both fungible and non-fungible assets,
- How to prove control of an asset and the use of registries,
- Provenance of assets,
- Temporal or perishable goods

It is impossible to imagine all of the effects or the opportunities created through the tokenization of assets. The amount of friction reduced and the standardization that can be created will likely have far reaching effects. However, the tokenization of rights on assets, goods, and services may ultimately dwarf all other benefits by a significant margin.

¹ For more information on tokenization of assets see our paper on Trusted Tokenization of Assets.

Tokenization of rights

A right is simply an agreement that gives one or more parties an entitlement to have or do something. By tokenizing a right, we make the parties entitled to the right “fungible.” Therefore, ownership of the token is the ownership of the right. The right to a first class seat on a plane, the right to buy something at a special price, the right to sell something under specific conditions, the right to appreciation in an asset, etc.

Rights can also be assets but the use of the word “right” in all of our papers defines the difference between “ownership” of the real-world asset or good and a “right” related to an underlying asset, good, or service. The goal of tokenization of rights is to create an asset out of the right. But since a right is dependent on an underlying asset, good, or service, we define them separately.

It is impossible to issue and tokenize rights unless the platform tokenizing the right also controls the asset. This is why the Sweetbridge platform manages both assets and rights in an integrated way. The Sweetbridge platform has an asset (including goods) and service registry with a rights registry for each. Every asset can have a list of rights that have been tokenized or granted to someone, even if that someone is different from the owner of the asset themselves. This allows the buyer of any particular asset to know what rights have previously been granted and must be upheld.

Another reason to handle them separately is that the tokenization of rights represents a blue ocean² opportunity for the creation of new value. The tokenization of assets and goods is mostly an efficiency gain on existing processes. The tokenization of rights is mostly new value creation.

One of the primary reasons for separating the ownership of an asset from the rights on the asset is that the owner of the asset does not necessarily have the same motive as the owner of a right on the asset. Therefore, by separating the ownership from the rights we can extract more value.

The tokenization of rights can be used to create value where none exists today. For example, tokenizing of the right to a future stream of discounts that are given away today creates a right to lower cost which is a tradable asset.

Tokenization allows us to create new, previously unrealized value out of assets, goods, and services. In many cases, this value can be created without diminishing any value in the underlying asset, good, or service. This is profound because it can enable countries, companies, or individuals to create new value where none is perceived to exist today. It is similar to discovering a property you own that has a container of gold buried on it. It's value you did not realize you own.

² Blue Ocean Strategy is a marketing theory from a book published in 2004 which was written by W. Chan Kim and Renée Mauborgne, professors at INSEAD. ISBN: 1-59139-619-0 978-1-62527-449-6

Because the Sweetbridge platform uses automation, rights can have behavior programmed into them. This means that tokenized rights can do things that paper rights could not without some costly manual intermediary enforcing the algorithm. This means that rights can be engineered to do things such as increase in value as a network or companies that use the rights grows. The opportunities from programmable rights is incredibly high but requires such sophisticated economic engineering that the Sweetbridge platform comes with a set of built-in programmable rights that can be easily used or adopted³.

The future product roadmap for Sweetbridge includes additional built-in rights for asset sharing, settlement risk swaps, and rights to revenue on use.

Escrows and workflows

The transfer of ownership of assets or rights may require a workflow related to a series of state transitions or document verifications that must be conducted even though the asset or right is tokenized. This is primarily needed for the transfer of ownership of tokenized real-world assets but can also be true for rights such as some derivatives. These workflows might execute quickly or they might take months. The Sweetbridge platform allows workflows to be defined and attached directly to assets or rights.

Workflows can be defined once for a class of tokens or they can be custom defined to a specific token as part of the sale. The definition of a workflow is encoded in a script that can be attached to any tokenized asset or right. The platform comes with numerous workflows built-in and new ones can be added when a pre-built workflow is not sufficient.

In supply chains, the purchase of goods might require a purchase order first, and then an inspection or sign off of goods at receipt before transfer of ownership. Bills of lading or agreements typically contain information on when the assets or goods will transfer ownership. This is frequently controlled by Incoterms (International Commercial Terms), which are a series of predefined commercial terms published by the International Chamber of Commerce, that govern when ownership transfers. The platform comes with pre-built workflows to support standard Incoterms. These can be easily customized or modified to suit a specific use case.

Escrows

The purchase of real estate might require an escrow which is a special type of workflow administered by a third party. When an asset is in escrow, it can't be sold to someone else or have any additional changes in rights. Escrows have a period of time they must be completed within or the asset falls out of escrow.

The Sweetbridge platform supports both automated and manual forms of escrows. Using the Synchronized Accounting platform's ability to do real-time audits, it is possible to automate any

³ For more information on tokenization of rights see our paper on Trusted Tokenization of Rights.

workflow that requires financial or data controls and third-party audits of documents or validations. The difference is these validations only need to be performed once as long as the automation controls the process.

The opportunity

The Sweetbridge platform provides the tools to create new value from existing assets, services, businesses, and relationship networks through tokenization. The total value of these new rights can be multiples of underlying value of the assets, goods, and services. The reason for this is that:

1. Rights can span time where the sale of something is primarily based on its value today, and
2. Rights can allow the buyer to buy the specific thing they want without paying for it and taking on all the other things that ownership implies.

The ability to create tokenized assets and rights that are audited and verified represents a huge opportunity for many existing organizations. It could literally transform their business models by adding rights to their goods or services and separating out rights on their assets. Early adopters will grow a whole new market and, in the process, grow their own share in their existing market.

The Sweetbridge Synchronized Accounting platform is designed to provide the operating system and tools that lawyers, accountants, auditors, regulators, asset custodians, insurance companies, liquidity providers, payment providers, investment banks, and management consulting firms need to create and validate these tokenized assets and rights. The platform does not seek to disrupt the current players but to give them a more powerful lever to create value whilst reducing friction, cost, and latency.

The players

Management consultants and investment banks will be able to create whole new business lines by helping their clients release new value. The ability for auditors and lawyers to make money by creating trusted financial templates also represents an opportunity to generate recurring revenue from fees charged for using standardized agreement components and audited templates within the system.

Logistics businesses, such as those that store and transport items in supply chains, can become asset custodians and add new lines of revenue and value to their asset-heavy low-margin businesses. Existing asset custodians can increase the value (and therefore the fees they can receive) or reduce their cost, thus increasing their profits.

Insurance companies can offer new services that bundle risk in new ways. They can distribute products wholesale by bundling insurance into the systems that tokenize assets and rights. Payment platforms can expand customers and maintain margins by enabling tokenized rights to money to be used as instant forms of payment, thus transferring value in seconds anywhere around the world.

Banks and liquidity providers can create new methods of lending that are lower risk, lower cost to customers, and produce higher margins. ERP systems and accounting systems can add the ability to tokenize assets and rights to their platforms enabling everyone from enterprises to small businesses to create and use tokenized rights.

New industries and all new products for consultants are being created.

The platform's power

Best of all, this can be done quickly and simply. The protocols enabling the tokenization of assets and rights, including the right to asset value and right to lower cost protocols, are written in Sweetbridge AXE script. Sweetbridge created and designed this script as a markup language for accountants, lawyers, and auditors. It can be used to create tokenized rights that can be real-time audited out of legal agreements, accounting treatments, and smart contract components.

Both of the built-in rights protocols were written in a few pages of AXE script, demonstrating the power of the platform to create sophisticated rights quickly and simply. AXE is a declarative language that does not require any knowledge of computer languages but instead is designed for professionals.

Though the Sweetbridge platform uses blockchains and advanced cryptographic technologies, it is primarily a decentralized peer-to-peer protocol that is blockchain agnostic. It is designed from the ground up to handle massive scale at low cost and privacy of information with transparency of validations.