Tokenized Voucher Investments

Unlocking Value Creation and Non-Equity Impact Investments

Whitepaper

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Abstract

Social Enterprises need options to raise capital without giving away equity. Impact investors need data driven investment opportunities. Tokenized Voucher (TV) Investments proposes a way for enterprises to issue vouchers against their production as a token on a distributed ledger (blockchain) along with transactional data - such that they can be bought and sold on DLT markets. Thus creating a data driven investment into the production of social enterprises without the purchase of equity.

Background

Enterprises creating vouchers is an ancient practice, going back as far as the Silk Road in China. In their basic form vouchers are simply promissory notes against goods and services. But when tokenized and incorporated into a DLT framework, vouchers, created by social enterprises, begin to take on the the shape of an investable utility token. Tokenized vouchers enable social enterprises to issue credit against their future production and use it to develop local circulation, customer loyalty and incentivize investments.
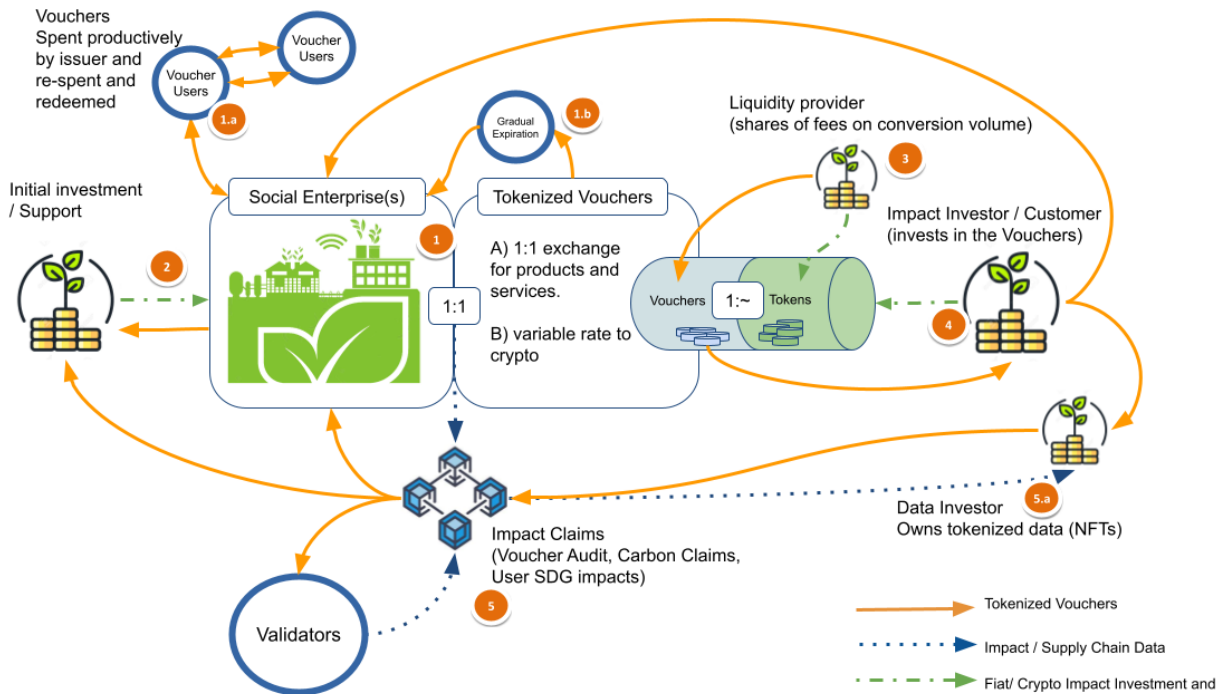

Figure A. Impact Investment Stages. This diagram shows the various ways Tokenized Vouchers can be invested in and is described throughout this paper.

1. Tokenized Voucher Issuance

In this section, we describe how the tokenized voucher issuance would work. A Social Enterprise, possibly through a special purpose vehicle, would issue a unique token (TV) against their future production valued in national currency (Figure A.1). For example: A vegetable cooperative in Kenya issues a token against redemption of vegetable produce.

TVs constitute a legally binding credit obligation against equivalent national currency valued goods and services. So if the Kenya vegetable cooperative issues 1000 TVs against redemption for vegetable produce - they should be redeemable for 1000 Kenyan Shillings of vegetable produce.

The benefit is that TVs are a way for a social enterprise to take out a zero interest loan against future production - the loan is given by anyone purchasing the voucher - all sold vouchers represent a presale of committed goods and/or services.

In order to ensure that the voucher is accepted by the public and as well as investors a publicly available authentication process and information is needed. :

Publicly Visible Authentication

1. **Audit Report:** The enterprise must show they have the capacity to redeem the vouchers for goods and services in a timely manner. An audit report is signed by a company official and an independent auditor.
2. **TV Supply Schedule:** The supply of TVs created must be on a clear schedule with an additional audit for each addition of TVs. Audits may also recommend the enterprise retire a portion of their vouchers.
3. **Gradual Expiration:** In order to limit liability and discourage hoarding, expiration dates on vouchers are a safe practice.
   a. Note that expired vouchers are automatically deducted from all TV holding accounts (via smart contract) and directed toward a specific account declared by the issuing enterprise.
4. **TV Data:** Note that the voucher creation contract, audit, endorsements, total supply of vouchers, their trade volume and distribution is publicly available for consumers to assess the viability of the TV.

1a. Spending Into Circulation

TVs can be sold by the issuing enterprise and also used to pay for labour, bonuses, suppliers, marketing (e.g. loyalty programs) and redeemable for goods and services (Figure A.1a). They enter

general circulation and can be re-traded and expired gradually (in the form of a directable tax). When well executed a TV involves a host of stakeholders (suppliers, resellers, employees, partnering businesses) who are involved in the TV creation process and ready to create circular trade networks.

1b. Expiration

TVs expire gradually over time (Figure A.1b) in order to reduce liability and ensure they are not being hoarded. This gradual expiration is in the form of an automatic holding tax to ensure that the 1:1 peg of TVs to products and services is held stable and valued in national currency. This gradual expiration effect all TVs since it is built into the blockchain smart contract. See https://gitlab.com/cicnet/erc20-demurrage-token/ .

Note that this form of gradual expiration is often called demurrage or a Gesell Tax and is a recommended method by economists to increase voucher circulation velocity without having a hard stop (single expiration date).

TV Investment Types

2. Initial Investment

Supporting a social enterprise to increase their production or the quality of their goods and services in exchange for vouchers against those goods or services (Figure A.2) is a way for an investor to help support an enterprise without buying equity.

For instance a bakery selling vouchers against their bread may raise enough money to build a better bakery and the investors can use those vouchers to buy bread in the future. Getting back 1000 Shillings worth of bread at a later date after buying 1000 Shillings worth of TVs is more of a savings rather than an investment, but if in exchange for an investment the enterprise was willing to give a preferred rate for their TVs - the investor could make a return on investment by using the vouchers for bread or reselling them. By utilizing blockchain technology the market for these TVs can be expanded.

3. Liquidity Provision

An investor or anyone holding both TVs and some other tokens (with national currency value), creates a liquidity pool (a contract like Uniswap that holds the TV and some other token like USDC) and charges fees on conversion between the TV and other tokens (Figure A.3). Note that the liquidity pool will have a variable exchange rate depending on the amount of TVs and other tokens in the pool.

4. Impact Investment

An investor can now add more tokens to the pool in order to invest in the Social Enterprise's production - pulling out some TV and also making TV more valuable in the pool (dynamic exchange

rate) (Figure A.4). When TV holders (like the Social Enterprise themselves) convert/liquidate their TVs to national currency or other tokens using the pool, they will then reduce the relative value of their TV to national currency. When the price is low, an investor or a customer of the social enterprise can inject tokens / money to get the TVs cheaply in order to buy products 1:1 (Beneficial arbitrage stabilizes the exchange rate).

Investment can be onboarded and off ramped from any regulated exchange that has the capacity for both digital assets and traditional fiat exchanges. The structures for this are subject to local regulation.

5. Data Investment

Data from TV usage, including user information and validators is collected and packaged into signed data objects (NFT Impact Claims) (Figure A.4). These can represent all kinds of supply chain information, SDG impacts, carbon offsets, and audits against the value of the TV itself.

Anyone holding TVs can access / support these NFTs. Note that TV payments on such a data marketplace can be divided automatically back to the enterprise, investors and validators.

Technology

In order to ensure that vouchers can be more than simply illiquid promissory notes backed by goods and services and more attractive as a medium of exchange and investment. We propose their creation on distributed ledger technology combined with liquidity pools and NFTs described below.

Blockchain

Tokenized Vouchers are issued on a distributed ledger (blockchain) so that they are secure and transparent. The blockchain enables anyone to see information about the TVs including their uch total supply, distribution and trade history . People can also view the contract that created them and assess it's viability and security. For instance as a blockchain based token, TVs would enable users to see what the expiration rate of the vouchers is.

Interfaces (UX / Wallets)

Blockchains enable anyone to build interfaces to them - meaning that users can have a variety of options on how to interact with their TVs.

For networks of users who can't or don't want to manage their account, private keys custodial systems can be created. Custodial USSD wallets can support people without the internet to trade their

vouchers. Point of Sales devices and marketplaces can just as easily integrate with a blockchain backend.

UX is essential for accessibility and successful adoption. Engaging with local designers and branding experts to address culturally digestible symbols and design is necessary, especially with populations that have multiple languages and where illiteracy rates are higher. Voice activation can also help illiterate users.

Liquidity Pools

In Decentralized Finance, liquidity pools are pools of tokens that are locked into a smart contract and that facilitate efficient asset trading while allowing investors to earn a return on their holdings - [Medium](#)

In their simplest form anyone holding two different tokens can create a blockchain contract that allows people to trade between those two tokens and take fees. A network of liquidity pools, like Uniswap, creates an exchange where many TVs issued by enterprises can be traded with each other as well as with other tokens that are redeemable for national currencies. Note that given proper bridging between blockchains the TVs can be created and traded cheaply on one chain while liquidity pools exist on another.

End users holding TVs now have more options than simply redeeming TVs for goods and services - they can use liquidity pools to convert their TVs into other TVs, tokens and even national currencies. This means that TVs have a much larger marketplace and potential for liquidity.

Signed Data and NFTs

A non-fungible token (NFT) is a unit of data stored on a digital ledger, called a blockchain, that certifies a digital asset to be unique and therefore not interchangeable. NFTs can be used to represent items such as photos, videos, audio, and other types of digital files. Access to any copy of the original file, however, is not restricted to the buyer of the NFT. While copies of these digital items are available for anyone to obtain, NFTs are tracked on blockchains to provide the owner with a proof of ownership that is separate from copyright. - [Wikipedia](#)

Data is valuable and can be packaged into validated bundles of information that can be sold and resold. For instance supply chain data related to organic products can be validated and used in market places. Carbon offset data as well can be packaged and sold on market places.

A NFT related to a TV holds all the data about it's issuance policy, endorsements, auditors, supply, trade volume and distribution. This NFT would be viewable by anyone wishing to know more about the TV before investing in it.

Other NFT types include supply chain data, carbon offsets, sustainable development goals and many other possible data packages. These NFTs should be considered as one of the products that can be purchased using TVs and can also exist on seperate blockchains that have good market access.

Use Cases

Stand Alone Social Enterprise

A. Enterprise: XYZ Inc.
B. Product: Recycled Paper Products.
C. Employees: 500
D. Marketplace Vendors: 10,000
E. Sales Revenue: 20 Million USD annually
F. Signed Data: Carbon Offsetting: 200 Tonnes per month.

1. Tokenized Vouchers Created: 10% of Sales Revenue = 2 Million USD worth of TVs (Named XYZ Vouchers)
   a. 1 Million vouchers used to purchase labor and supplies as well as for customer loyalty programs.
   b. Expiration 1% monthly (taken minute by minute) returned to XYZ Inc.
2. Initial Investment: Investor Impact R-Us believes in the future of XYZ Inc. and buys 750,000 USD worth of XYZ Inc. token. 1 Million USD of XYZ vouchers is purchased for 750,000 USD by Impact R-Us. The money goes toward increasing production and quality of XYZ inc.
3. Liquidity Pool Investment: Impact R-Us places 500k USD of XYZ vouchers with another 500k of USDC (equivalent to USD) in a liquidity pool with a 1% fee on trade volume between XYZs and USDC. A volume of trade of 500k will yield $5000 USD. Increasing this trade volume will involve connecting XYZ vouchers to many markets.
4. Impact Investors: Once the price in the liquidity pool drops due to XYZ holders converting to USDC, Impact R-Us or any Investor can inject USDC to remove XYZ vouchers and use them to buy XYZ Inc's products or data at preferred rates.
5. Data Investor: Impact R-Us or anyone holding XYZ vouchers can use them to purchase signed data bundles (NFTs) and potentially resell those.

Impact R-Us plans to liquidate all XYZ holdings over 4 years. The success of the company has increased the demand on XYZ Inc. products, services and data - driving demand on the liquidity pool to produce 50 Million USD in trade volume - producing 0.5 Million USD in transfer fees for Impact R-Us. The remaining investment in the pool (500k USDC) can be removed from the liquidity pool along with 500k XYZ vouchers. The remaining vouchers, those that were in the liquidity pool and those not placed in the liquidity pool, can be used to purchase Data NFTs for carbon offsets at ~$6 (in XYZ vouchers) per tonnes and resold on carbon markets once they reach $12 per tonne.

Group Enterprise

A. Enterprise: A group of several businesses (Chama)
B. Product: Several goods and services
C. Employees/members: 28 small businesses
D. Marketplace Vendors: 28 small businesses with 100 clients each.
E. Sales Revenue: 1 thousand USD monthly
F. Signed Data: Credit scoring information

1. Tokenized Vouchers Created: 1 Month of combined sales revenue = 1 thousand USD worth of TVs (Named Chama Vouchers)
   a. 1 thousand vouchers are divided among the 28 members of the group and used to purchase labor and supplies from each other as well as from people outside the group.
   b. Expiration 1% monthly (taken minute by minute) returned to the main Chama account.
2. Initial Investment: Investor Impact R-Us believes in the future of the Chama and buys 500 USD worth of Chama vouchers. 700 USD of Chama vouchers is purchased for 500 USD by Impact R-Us. The money goes toward increasing production and quality of Chama products.
3. Liquidity Pool Investment: Impact R-Us places 500 USD of XYZ vouchers with another 500 of USDC (equivalent to USD) in a liquidity pool with a 1% fee on trade volume between Chama vouchers and USDC. A volume of trade of 50k will yield $500 USD. Increasing this trade volume will involve connecting Chama vouchers to many markets.
4. Impact Investors: Once the price in the liquidity pool drops due to Chama holders converting to USDC, Impact R-Us or any Investor can inject USDC to remove Chama vouchers and use them to buy the Chama's products or data at preferred rates.
5. Data Investor: Impact R-Us or anyone holding Chama vouchers can use them to purchase signed data bundles (NFTs) and potentially resell those.

Impact R-Us plans to liquidate all Chama holdings over 4 years. The success of the company has increased the demand on Chama products, services and data - driving demand on the liquidity pool to produce 50k USD in trade volume - producing 500 USD in transfer fees for Impact R-Us. The remaining investment in the pool (500 USDC) can be removed from the liquidity pool along with 500 Chama vouchers. The remaining vouchers, those that were in the liquidity pool and those not placed in the liquidity pool, can be used to purchase Data NFTs for credit scoring data and resold to banking partners. Note that many Chama vouchers can be aggregated into portfolios for investments at scale.

Student Voucher

A. Enterprise: Sally Njeri
B. Product: Blockchain software (in future)
C. Employees: -
D. Marketplace Vendors: -
E. Sales Revenue: 100,000 USD annually in software development (rrojected)
F. Signed Data: Proof of coursework and CV

1. Tokenized Vouchers Created: 10% of consulting income = 10,000 USD worth of TVs (Named Student Vouchers)
   a. 10,000 vouchers are used by the student to purchase training courses and other needs like rent and food while studying.
   b. Expiration 1% monthly (taken minute by minute) returned to Sally.
2. Initial Investment: Investor Impact R-Us believes in the future of Sally and buys 5,000 USD worth of Student vouchers. 5,000 USD of Student vouchers is purchased for 4,000 USD by Impact R-Us. The money goes toward supporting the student with a stipend while they learn.
3. Liquidity Pool Investment: Impact R-Us places 4000 USD of Student vouchers with another 5000 of USDC (equivalent to USD) in a liquidity pool with a 1% fee on trade volume between Student vouchers and USDC. A volume of trade of 400k will yield $4000 USD. Increasing this trade volume will involve connecting Student vouchers to many markets.
4. Impact Investors: Once the price in the liquidity pool drops due to Student Voucher holders converting to USDC, Impact R-Us or any Investor can inject USDC to remove Student vouchers and use them to buy Sally's consulting services or data at preferred rates.
5. Data Investor: Impact R-Us or anyone holding Student vouchers can use them to purchase signed data bundles (NFTs) and potentially resell those.

Impact R-Us plans to liquidate all Student holdings over 4 years. The success of the training and experience has increased the demand on Sally's consulting and data - driving demand on the liquidity pool to produce 400k USD in trade volume - producing $4000 USD in transfer fees for Impact R-Us. The remaining investment in the pool (5400 USDC) can be removed from the liquidity pool along with 4000 Student vouchers. The remaining vouchers, those that were in the liquidity pool and those not placed in the liquidity pool, can be used to purchase Data NFTs for representing Sally's CV and resold on job markets. Note that many Student vouchers can be aggregated into portfolios for investments at scale.

Voucher Portfolios

A. Enterprises: Several enterprises have all issued their own TV (A,B,C, … etc) Another enterprise created a common tokenized voucher that will be linked to TV's A,B,C,...
B. Product: These enterprises might offer a variety of products or similar product but in different locations (e.g. representing Internet Service Providers across an area of Kenya)
C. Employees: -
D. Marketplace Vendors: -
E. Sales Revenue: -
F. Signed Data: -

1. Tokenized Voucher Created: A common token is created called Y by Impact R-Us.
   a. Y is created with a supply of 200k - matching 10% of the supply of TV's (A,B,C)
   b. A Liquidity pool with 100k USDC tokens and 100k Y's is created.
2. Initial Investment: Investor Impact R-Us believes in the future of Tokens A,B,C … and buys 10,000 USD worth of each TV (A,B,C).

3. Liquidity Pool Investment: Impact R-Us places 10,000 USD of each A, B, C TVs into a pool with another 10,000 of token Y.
    a. 4 liquidity pools exist here A-Y, B-Y, C-Y and USDC-Y all with a 1% fee on trade volume.
    b. TV's A,B,C are all exchangeable for Y and hence each other and also for USDC.
4. Impact Investors: Once the price in the liquidity pool drops due to people converting A,B,C or Y to USDC, Impact R-Us or any Investor can inject USDC to remove Y, A, B, or C TVs and use them to buy enterprise services or data at preferred rates.
5. Data Investor: Impact R-Us or anyone holding A,B,C, or Y vouchers can convert between them and use them to purchase signed data bundles (NFTs) and potentially resell those.

The Y voucher in this case is connecting three other TVs and operating as a network token that bridges between them. Other impact investors that are interested in the A,B,C portfolio can add USDC to hold Y as a way to invest in A,B, and C.

Impact R-Us plans to liquidate all Y holdings over 4 years. The success of the training and experience has increased the demand on A,B and C enterprises products and data - driving demand on the liquidity pool to produce trade volume on the liquidity pools and transfer fees for Impact R-Us. The remaining investment in the pool can be removed from the liquidity pool along with A,B,C vouchers.

Monitoring

When executed on public ledgers (DLTs) all elements of TVs are publicly viewable - but require dashboarding and reporting tools. An investor will want to monitor the flows of TVs used for local production and redemption for products, services and data well before they invest. Signatories that audit and endorse the TV issuing enterprise as well as peer to peer endorsements of products being sold are key data elements as well that are crucial for the assessment of the value of a TV.

Various forms of dashboards and analytics should be provided as in the above example to monitor TV usage. THe main source of data about the TVs is captured via DLT transactions as well as NFTs that assess TV metrics like volume of trade and distribution, clustering and so on. Finally liquidity pool data stores crucial elements that can give investors confidence in market demand for TVs.

Risk and Mitigation

Legal obligations of TV issuers: How can the issuers of TVs be held accountable and also limit their liability over time? The contract that enterprises sign to develop their TVs legally must be legally binding and litigatible and protect both the issuer and future holders.

Insurance against dissolution or failure of redemption by a TV issuer: Anyone holding TVs holds the risk that the issuing enterprise will no longer redeem them. Since these vouchers live on a DTL they could potentially outlast the enterprise issuing them and leave their holders at a loss. Developing insurance contracts that safeguard these situations similar to FDIC insurance would give investors more confidence.

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