Crowdvouched: A Decentralized Crowdsourcing Platform

Adam Kraft

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Abstract

Crowdvouched is a decentralized crowdsourcing platform for gathering data and making it publicly accessible as a shared resource. By placing bounties on pieces of information, Crowdvouched incentivizes contributors to locate, submit, and verify data. The submitted data is validated through a "proof of useful work" mechanism and participants are rewarded with project-specific tokens. The tokens are backed by project treasuries funded through donations and additional revenue streams. Solved bounties are stored on a decentralized storage system, making them accessible to all. This allows them to be easily integrated into other Web3 applications.

Public goods can be boring, but Crowdvouched changes that by making crowdsourcing both rewarding and fun with gamification elements such as leaderboards and reputation scores. Crowdvouched's inaugural project focuses on digitizing the historic 1850 U.S. Census, demonstrating Crowdvouched's potential before expanding to other applications.

Introduction

Problem Statement

In a world where big data drives innovation and decision-making, much of this data is not easily accessible to the public. Data is often controlled by centralized organizations, such as governments or corporations, which impose significant restrictions on access. APIs, if available, are typically limited to registered users who must provide personal information to obtain an API key. These APIs often come with rate limits and may require payment for access, further restricting the ability of users to fully utilize the data. Additionally, there is always the risk that these APIs could be shut down, rendering any dependent applications inoperable. This lack of open access hinders innovation, transparency, and the potential for widespread data use.

Crowdvouched addresses this gap by enabling decentralized crowdsourcing to make data openly accessible and verifiable to the public. However, traditional crowdsourcing methods also face critical challenges that Crowdvouched aims to solve. These challenges include:

1. **Centralization**. Traditional data collection methods are often centralized, relying on a single entity or a limited group of validators to gather and verify information. This centralization can lead to issues of trust, as users must rely on the integrity and competence of these centralized entities. Additionally, centralization introduces the risk of data manipulation, corruption, or bias, which can compromise the quality and reliability of the collected data.

2. **Scalability**. The process of gathering and validating large volumes of data through centralized methods is inherently slow and resource-intensive. This lack of scalability hampers the ability to efficiently manage and process data, particularly for large-scale projects such as historical digitization or public record verification.

3. **Incentive Misalignment**. In many traditional data collection models, there is little to no direct incentive for individuals to participate in the data acquisition or validation process. Without adequate rewards, the motivation to contribute accurate data is diminished, leading to lower data quality and reduced engagement from potential contributors.

4. **Data Integrity and Verification**: Ensuring the accuracy and integrity of data is a significant challenge, especially when dealing with large datasets. Traditional methods often lack the robust verification mechanisms needed to guarantee data accuracy, leading to errors and inconsistencies that can undermine the value of the data.

5. **Barriers to Participation**: Existing data collection frameworks can be difficult for individuals to engage with, either due to complexity, lack of transparency, or insufficient rewards. These barriers prevent a broader pool of potential contributors from participating, limiting the diversity and comprehensiveness of the data collected.

These challenges highlight the need for a more effective and decentralized approach to data acquisition and validation—one that leverages community participation, aligns incentives, and ensures the highest standards of data integrity and accessibility. Crowdvouched is designed to address these challenges, providing a scalable, transparent, and secure platform for data-driven projects across a wide range of applications.

Solution Overview

A user creates a Crowdvouched Campaign, which is a collaborative project designed to gather and validate data. Each campaign defines the necessary information that guides crowdsourcers in finding and submitting records. To fund the project, each campaign has a treasury, and

individuals or organizations can send ETH to support the campaign. Each campaign has its own token backed by this treasury, representing a proportion of the treasury's total funds.

Crowdsourcers, who can be human participants or AI agents, request records through a platform interface. When a crowdsourcer requests a record, the campaign's smart contract assigns it to them, and they enter the required information. Once submitted, the data is validated by comparing submissions from multiple crowdsourcers. If two submissions match 100%, the data is validated and stored permanently.. Crowdsourcers are rewarded with campaign tokens for successful submissions, and their reputation is updated based on the accuracy of their work. This process continues until all records are validated. Once complete, the campaign is closed, and token holders can redeem their tokens for a portion of the treasury.

Token-Based Incentives. To motivate participation, Crowdvouched introduces project-specific tokens as rewards. Crowdsourcers earn tokens when their data submissions are successfully validated by other participants. These tokens are tied to the project's treasury, giving them real value that can be redeemed or traded. The platform's built-in reputation system also ensures data quality by rewarding accurate submissions and penalizing errors, encouraging contributors to provide the best possible data.

Each project operates with its own unique token, creating a self-sustaining economy where contributors are fairly compensated for their efforts and have a vested interest in the success of the project.

Gamification. Crowdvouched integrates gamification to enhance engagement and competition within the platform. Record validation is turned into a competitive activity, where crowdsourcers' performance is tracked through reputation scores. Leaderboards showcase top contributors, adding a sense of rivalry and recognition for those who consistently provide accurate data. This competitive element motivates crowdsourcers to improve their performance and take an active role in the success of the campaign. By making data validation fun and rewarding, Crowdvouched encourages higher accuracy and participation, transforming crowdsourcing into a more dynamic experience.

Data Accessibility. Once data is gathered and validated, it is stored on a decentralized storage network, ensuring permanent availability. This eliminates the typical barriers of traditional data access, such as API rate limits, registration requirements, or fees. Researchers, developers, and the general public can freely access and build upon the data, fostering innovation without restrictions.

By decentralizing both the data collection process and data storage, Crowdvouched ensures that data is open, verifiable, and permanently available to anyone who needs it.

Use Cases

Crowdvouched's decentralized crowdsourcing platform can be applied to a wide variety of industries and data-gathering projects. Below are some examples of how Crowdvouched can

unlock new possibilities for data acquisition and validation.

1. **Historical records:** Some publicly available data is unavailable because it hasn't been digitized. A good example is historic United States census data from 1790 to 1950. Census data is handwritten by census-takers, and the census data is available as microfilm. Unfortunately, this means computer programs cannot access it. While some genealogy companies have digitized the census data, it is not knowingly accessible via an API. A user can sign up for the genealogy website, pay a lot of money, and can access the historic census data via a web GUI, but this is a far cry from programmatically accessing it. At the moment it's not possible to access historic census data via an API, even though it is publicly available.

2. **Sports data:** While everyone knows the score of last night's game or which player scored the most goals, machines have a harder time accessing this information. Sports data is often locked behind expensive APIs, with rigid limitations even on free tiers. Companies in industries like fantasy sports rely on accurate and timely data, forcing them to pay API providers for access. Major companies control API data for leagues such as the NBA, MLB, and NHL. By using Crowdvouched, sports data can be crowdsourced, validated, and made accessible in a decentralized manner, breaking the reliance on centralized API providers and creating open access to valuable sports data.

3. **Police shooting data:** Some data is publicly available yet remains largely unknown because it hasn't been systematically sourced. A prime example is the number of police shootings in the United States. While this data exists, it's fragmented across thousands of local police departments, with no central repository to track it. The FBI does not collect this data, leaving a gap in understanding the full scope of police shootings nationwide. By using Crowdvouched, data from police reports can be crowdsourced, validated, and consolidated into a single, decentralized dataset, making it publicly accessible for researchers, policymakers, and the general public.

While the platform's inaugural project focuses on digitizing the 1850 U.S. Census, Crowdvouched is designed to support a wide array of data-driven initiatives. Crowdvouched's flexible and modular architecture can be applied to virtually any project that requires accurate and trustworthy data collection.

As the platform evolves, it will open up to new projects, each with its own token and economic model, allowing for a diverse range of applications and use cases. Crowdvouched is more than just a data collection tool; it is a comprehensive solution that addresses the fundamental challenges of data acquisition, validation, and accessibility.

Platform Overview

Crowdvouched is built around a set of core features that enable seamless data acquisition, validation, and management through decentralized crowdsourcing. These features are designed to ensure data integrity, incentivize participation, and provide a flexible framework for a wide range of data-driven projects.

Campaign Creation

Crowdvouched provides a flexible framework for creating data-driven projects. Users who wish to initiate a new project on the platform can do so by following a simple project creation process, which involves defining the scope of the project, the data records required, and the rules for data submission and validation.

To start a project, users must stake a certain amount of the platform's native tokens, which serves as a commitment to the project's success. This staking requirement ensures that project creators are incentivized to see the project through to completion. Once the project is created, it is listed on the Crowdvouched platform, where crowdsourcers can begin submitting data.

Data Submission

At the heart of Crowdvouched is its decentralized data submission system, which empowers users to contribute data to various projects. Each project on the platform is broken down into smaller, manageable data records, which are assigned to crowdsourcers. These data records could range from specific entries in historical records, such as census data, to modern-day information verification tasks.

Crowdsourcers submit data through a Farcaster Frame that guides them in providing the necessary details for each data record. Once a submission is made, it is recorded on the blockchain.

Validation Mechanisms

Data validation is essential to the Crowdvouched platform, ensuring that collected data is accurate and reliable. After a crowdsourcer submits a data record, it undergoes an asynchronous validation process, where the same record is independently assigned to another crowdsourcer. When the second crowdsourcer submits their entry, it is compared to the first. If both submissions match 100%, the data is automatically validated—this is called "optimistic validation."

Once validated, both crowdsourcers are rewarded with newly minted, project-specific tokens, which represent a share in the project's value. This reward system incentivizes accurate data submissions, as crowdsourcers are directly compensated for their contributions.

If there is a discrepancy between submissions, the data is assigned to a third crowdsourcer. This process repeats until two submissions match, or until the maximum number of failed validations, set by the campaign creator, is reached. When the limit is hit, the campaign owner must step in. They can either accept one submission, create their own, or resume the validation process by allowing more crowdsourcers to attempt validation. The asynchronous nature of this process enables efficient validation across large datasets, ensuring rigorous review while keeping crowdsourcers motivated through token rewards.

Note that the number of required validations is set by the campaign creator. For example, if they set this to five, then five validations are needed and five tokens are minted per record validation.

Data Access

Crowdvouched stores validated data on Arweave, a decentralized storage network, ensuring that it is permanently available and accessible to the public. While Crowdvouched doesn't provide direct API access, users can easily retrieve data using decentralized indexing and querying tools, such as The Graph. These tools enable flexible, API-like access to data without relying on centralized servers, empowering users to build applications, conduct research, or analyze datasets directly from the blockchain.

Reputation System

The Crowdvouched reputation system is designed to maintain data quality and reward accuracy. Each crowdsourcer on the platform has a reputation score, which starts at a default level and adjusts based on the accuracy of their submissions.

When a crowdsourcer's data record is validated as correct, their reputation score increases. This higher reputation serves as a reflection of the crowdsourcer's reliability and accuracy. It may provide advantages in future projects, where certain tasks could have minimum reputation requirements.

If a data record submission is found to be inaccurate, the crowdsourcer's reputation score decreases in proportion to the degree of incorrectness. For instance, a partially correct submission incurs a smaller penalty than a completely incorrect one. This nuanced approach to adjusting reputation encourages crowdsourcers to submit data with care and precision.

Crowdsourcer Eligibility

Campaign creators can set specific eligibility criteria to control who can participate as a crowdsourcer in their campaigns. These criteria help ensure that participants meet certain standards or qualifications. A creator can require that crowdsourcers:

1. Own a specific NFT.
2. Hold a minimum amount of a specific token.
3. Maintain a minimum Crowdvouched reputation score.

These eligibility conditions are optional, and the campaign creator can choose to make the campaign open to all participants. This flexibility allows creators to tailor eligibility to suit the specific needs of their campaign.

Campaign Treasury

Each campaign on Crowdvouched has its own treasury, designed to financially support the project both during and after its completion. The treasury exists indefinitely and continues to grow through various mechanisms. It serves as a source of funds for rewards, ongoing project support, and long-term sustainability. The treasury grows in the following ways:

1. **Donations:** Individuals and organizations can contribute ETH to the campaign treasury directly, helping to support the project's progress and incentivize crowdsourcers.

2. **DeFi Yield:** The treasury can be invested in decentralized finance (DeFi) platforms, where it earns yield over time. This helps ensure continuous growth of the treasury, benefiting both current and future contributors.

3. **Mintings:** Validated records can be minted as NFTs, and the campaign creator sets the minting fee when the campaign is created. Anyone can mint these NFTs by paying the fee, with the proceeds directed into the campaign treasury.

4. **Royalties:** Royalties from secondary sales of NFTs flow back into the treasury.

5. **Retroactive Contributions:** Organizations or individuals who derive value from the data collected during the campaign can make retroactive contributions to the treasury, further boosting its funds after the campaign has ended.

The campaign treasury is a dynamic financial tool that ensures the project remains sustainable and that participants are rewarded fairly, both during and after the campaign's lifecycle.

Project-Specific Tokens

Crowdvouched introduces an innovative use of ERC20 tokens to drive the economic model of each project. When a campaign is created, a unique token is created, dynamically minted as the project progresses. Tokens are distributed as rewards for crowdsourcers who validate data records. Each time two crowdsourcers submit matching data for a task, the record is validated, and both participants receive one newly minted token for their correct submission.

The value of these tokens is tied to the project's treasury, which is funded through donations, NFT sales, and other contributions. As the project moves forward, the treasury grows via yield-generating strategies, ensuring that token holders benefit from increased value. Once the project is completed, token holders can redeem their tokens for a share of the treasury, providing tangible financial value, and each redeemed token is subsequently burned.

Additionally, project-specific tokens offer flexibility in how they are used. They can be traded immediately after minting, providing liquidity to participants. Even after a project is completed, tokens may hold continued value through post-completion trading, backed by ongoing treasury growth from retroactive contributions and NFT royalties. This dynamic token system ensures that contributions to the project are rewarded while aligning the interests of all stakeholders.

Technical Architecture

Crowdvouched is built on Base, an Ethereum Layer 2 chain. It integrates on-chain components, decentralized storage networks (Arweave), and off-chain elements such as Farcaster Frames and relayers. This hybrid approach enables the platform to handle large-scale data acquisition projects.

Workflow

1. Campaign Creation: The campaign creator sets the crowdsourcer eligibility requirements and the locator data required to identify records. Locator data is the data crowdsourcers will use to locate the records.

When the user deploys the campaign, the campaign's smart contracts are deployed. In addition, the locator data is uploaded to Arweave for permanent storage. Once deployed, the campaign becomes active on Crowdvouched, allowing crowdsourcers to participate by requesting records and submitting data. In addition, anyone who supports the campaign can send ETH to the campaign's treasury.

2. Farcaster Frame: Crowdsourcers interact with Crowdvouched through a Farcaster Frame. In the Frame, they select a campaign and press the "Start" button to be assigned a record by the campaign's smart contract. The Frame displays the locator data that the crowdsourcer will use to find the corresponding record. Once they find the data, the crowdsourcer enters it one field at a time until all fields are complete. After pressing "Submit," the data is sent to Crowdvouched for processing. If they like, they can choose to receive another record.

3. Record Assignment: Crowdvouched employs a relayer service to manage the assignment of records to crowdsourcers efficiently and cost-effectively.

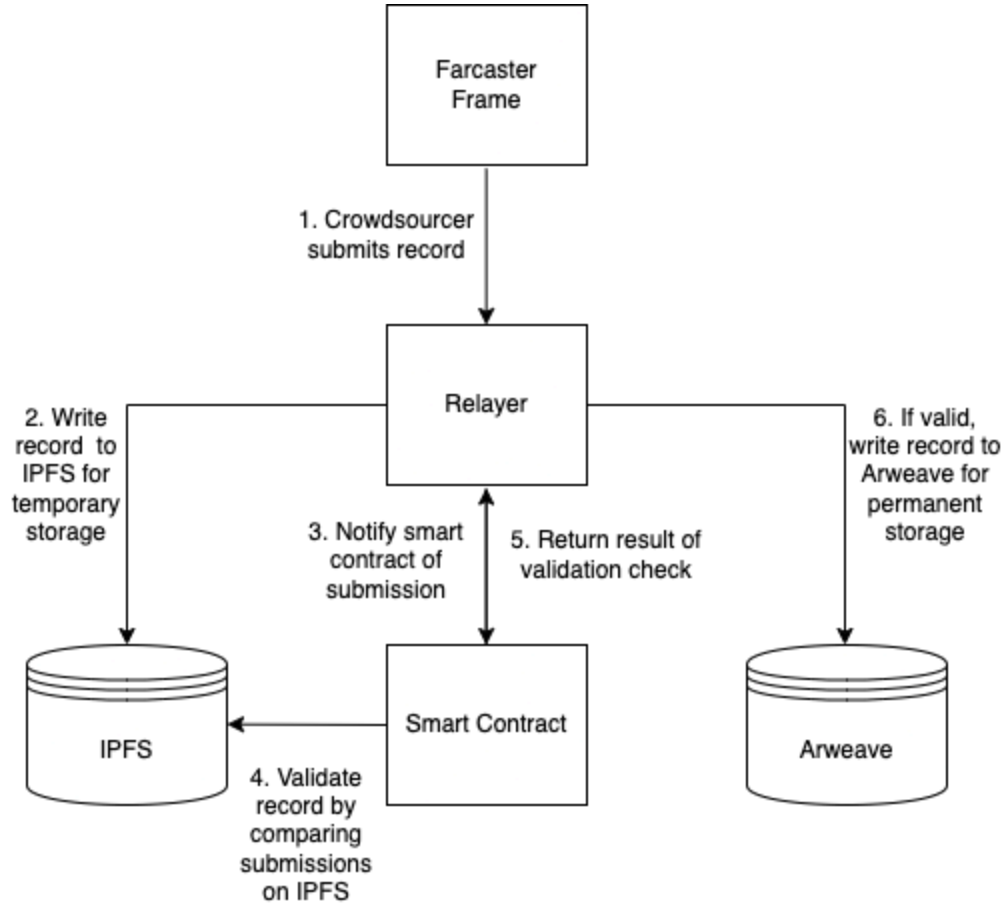
1. When a crowdsourcer requests a record by pressing the "Start" button in the Farcaster Frame, they sign a meta-transaction. This signature authorizes the assignment request without requiring the user to pay gas fees directly.
2. The signed meta-transaction is sent to a relayer service, which submits the transaction to the campaign's smart contract on behalf of the crowdsourcer. The relayer covers the gas costs, allowing the crowdsourcer to participate without incurring fees.
3. The smart contract assigns the next available locator data to the crowdsourcer.
4. The assignment is logged on-chain.

4. Data Submission: When a crowdsourcer submits the data from the Farcaster Frame, they sign a meta-transaction. The signed meta-transaction is sent to a relayer service, which uploads the submission data to IPFS for temporary storage. The relayer then notifies the campaign's smart contract that a submission has occurred. If they like, the crowdsourcer can request another record through the Farcaster Frame.

5. Data Validation: When the relayer notifies the campaign's smart contract that a submission has occurred, it checks the status of the locator data. If it is the locator data's first time submission, the smart contract is updated and the locator data is eligible to be assigned to a second crowdsourcer. If it is the locator data's second submission, the smart contract compares the two submissions by pulling the submission data from IPFS. If the two submissions are a 100% match, the data record is considered validated and the following actions occur:

1. The contract is updated to reflect that the data record is validated and is no longer eligible to be assigned.
2. A campaign token is minted as a reward for both crowdsourcers.
3. The crowdsourcers' reputation score is updated.
4. The relayer uploads the data record to Arweave for permanent storage.
5. The data record becomes eligible to be minted as an NFT.

If the two submissions do not match, the contract is updated and the locator data is eligible to be assigned to a third crowdsourcer. This process continues until two submitted records get a 100% match.



6. Campaign Completion: When all locator records are validated, the campaign is closed. Campaign tokens can now be redeemed for a proportion of the campaign treasury. The treasury exists forever, as long as there is at least one campaign token in existence.

Smart Contracts

1. **Campaign Contract**
   Manages each campaign's configuration, including the crowdsourcer eligibility requirements and the definitions needed for locating and digitizing records. The campaign's locator data is uploaded to decentralized storage and linked via an on-chain transaction ID, creating a permanent connection to off-chain data.

2. **Submission Manager Contract**
   Oversees record assignment and submission tracking. Each crowdsourcer can request records, and the contract prevents duplicate work by ensuring a crowdsourcer does not receive the same record twice. This contract manages records actively being validated and logs on-chain updates once a record is completed.

3. **CampaignTreasury Contract**
   Maintains each campaign's treasury, accepting ETH contributions and handling DeFi

investments to earn yield. The treasury mints project tokens upon data validation and distributes them to validated crowdsourcers. Participants may redeem tokens for a share of the treasury when a campaign completes.

4. **Crowdvouched Manager Contract**
   This global contract governs platform policies, oversees campaign suspension and resumption, and manages crowdsourcer restrictions, providing high-level control and maintenance.

5. **Campaign NFT and Token Contracts**
   The ERC20 (project token) and ERC721 (NFT) contracts manage the project-specific tokens and NFTs, respectively, supporting minting and trading functions for each campaign. Validated data records may be minted as NFTs, with fees contributing to the campaign treasury.

Tokenomics

Crowdvouched's tokenomics structure is designed to incentivize participation, ensure project sustainability, and align the interests of contributors with the long-term success of the platform. The token system consists of two types of tokens: the platform-wide VOUCH token and project-specific ERC20 tokens. Together, these tokens create a dynamic ecosystem that rewards contributors and funds campaigns.

VOUCH Token

The VOUCH token is the governance and utility token for the Crowdvouched platform. Here's how VOUCH supports the platform's ecosystem:

- **Governance**: Holders of VOUCH tokens participate in the governance of Crowdvouched, helping decide on platform-wide and project-specific proposals. This includes setting campaign staking fees, disabling campaigns, campaign suspension and resumption, and malicious crowdsourcer banning. If a campaign is deemed inappropriate or possibly legally dubious, token holders can vote to disable the campaign. Also, if an active campaign gets stuck with unvalidated data records and it cannot be completed, token holders can vote to take over campaign management from the current owner. They can also choose to liquidate the campaign, allowing project token holders to redeem their tokens. If a crowdsourcer is found to be acting maliciously, such as intentionally submitting invalid data or attempting to coordinate malicious behavior with other crowdsourcers, they can be permanently banned from the platform.
- **Campaign Staking**: Campaign creators must stake VOUCH tokens to launch a new campaign. This stake is returned to them upon successful completion of the campaign, but if the campaign fails to reach its goals or is abandoned, the stake is forfeited. This mechanism ensures that campaign creators are committed to seeing their projects through to completion.

- **Crowdsourcer Staking**: Crowdsourcers are required to stake VOUCH tokens to participate in campaigns. This mechanism ensures that contributors are committed to providing high-quality data.
- **Yield Sharing**: VOUCH token holders benefit from a portion of the yield generated by the campaign treasuries. Ten percent of the combined yield is allocated to staked VOUCH tokens.

By staking, governing, and earning yield, the VOUCH token plays a multi-functional role, incentivizing active participation and aligning the interests of all stakeholders on the platform.

Project-Specific Tokens

One of the distinguishing features of Crowdvouched is its innovative use of project-specific ERC20 tokens. Each project on the platform is linked to its own unique token, which plays a critical role in incentivizing participation and driving the economic model of the project.

Token Creation and Minting. When a new project is launched on Crowdvouched, a project-specific ERC20 token is created. These tokens are unique to each project and are created as the project progresses. The total supply of these tokens is not predetermined but rather dynamically generated based on the progress of the project.

Tokens are minted each time a data record is validated through the platform's decentralized crowdsourcing and validation process. Specifically, when two crowdsourcers independently submit matching data records for a given task, the data is considered validated, and one token is minted for each correct submission. As a result, both crowdsourcers involved in the validation process receive one newly minted token as a reward.

The value of project-specific tokens is tied to the project's treasury, which is funded through donations, NFT sales, and other contributions. Once a project is completed, token holders can redeem their tokens for a proportionate share of the treasury. This redemption process provides a tangible value to the tokens, ensuring that contributors are compensated for their efforts.

Post Campaign Token Distributions. When creating a campaign, the campaign creator can set up automatic token minting after the campaign is completed. For instance, if the campaign creator wants to reward an artist for designing NFTs, they can allocate 1% of the total token supply to the artist. This means that when the campaign concludes, 1% of the tokens will be minted and sent to the specified Ethereum wallet address. The campaign creator only needs to specify the percentage and the recipient’s wallet address.

Deriving Token Value. The value of project-specific tokens is derived from the project's treasury, which grows over time through various funding mechanisms and yield generation strategies.

1. **Treasury Growth**: As the project progresses, its treasury accumulates funds through donations from individuals and organizations interested in the data being gathered, as

well as through the sale of NFTs linked to the data records. To maximize the value of the treasury, the funds are automatically deposited into a DeFi platform to earn yield. This strategy ensures that the treasury continuously grows over time, enhancing the value of the project-specific tokens. The yield generated from these DeFi investments is reinvested into the treasury, further increasing the potential returns for token holders.

2. **Immediate Trading**: Project-specific tokens can be traded immediately after they are minted, providing instant liquidity to crowdsourcers. This feature allows participants to capitalize on their contributions right away, either by holding the tokens as a long-term investment or by trading them on secondary markets. The ability to trade tokens instantly adds flexibility and can attract participants looking for more immediate financial rewards.

3. **Redemption and Burning**: While tokens can be traded at any time, they can only be redeemed once the project is officially completed. Upon project completion, token holders can redeem their tokens for a proportionate share of the project's treasury. After a token is redeemed, it is subsequently burned. This burning mechanism ensures that the token supply decreases over time.

4. **Post-Completion Trading**: After a project is completed and tokens can be redeemed, project-specific tokens can continue to hold value in secondary markets. The treasury, which backs these tokens, can grow not only through ongoing yield from DeFi investments but also from retroactive contributions and NFT royalty sales. Organizations or companies that benefit from the data collected may choose to make retroactive contributions to the treasury. Additionally, NFTs linked to the project can include royalty clauses, where a percentage of each subsequent sale is directed back to the treasury. This potential for continued growth ensures that the value of the tokens can increase even after the project’s primary objectives have been met. Token holders may choose to trade these tokens, particularly if the project gains historical or cultural significance, adding a speculative aspect to token ownership.

In summary, project-specific tokens on Crowdvouched serve as a crucial mechanism for rewarding participation, ensuring data quality, and tying the economic value of the project to the efforts of its contributors. By linking these tokens to a growing treasury, enhanced by DeFi yield generation and retroactive contributions, and allowing for their immediate trading and eventual redemption and burning, Crowdvouched creates a robust and dynamic token economy that aligns the interests of all participants.

Use Case: The 1850 U.S. Census

Crowdvouched's inaugural project will be the digitization of the 1850 U.S. Census. This project highlights the platform’s ability to harness decentralized crowdsourcing to digitize historical records accurately and efficiently.

Background

The 1850 U.S. Census contains crucial demographic data from a pivotal time in American history, documenting the population just before the Civil War. While the census has been digitized by a few genealogy companies, it is not easily accessible to the public. Current access is limited to basic searches through proprietary platforms, often requiring users to log in. There is no API access for more complex queries or large-scale analysis. Crowdvouched offers a solution by decentralizing the digitization process, making the data permanently accessible and open to anyone. Through Crowdvouched, the census is broken down into individual data records, which are distributed to a global community of crowdsourcers for verification and validation.

1. Campaign Creation

The campaign creator initiates the campaign by providing key details:

- Campaign Name: "1850 U.S. Census"
- Token Name: "USC1850"

Next, they define the Locator Data Field Names—state, county, page, and line—representing the minimum information a crowdsourcer needs to locate a specific census record.

The creator also defines the Data Record Field Names, which are the actual fields in the census that the crowdsourcer needs to extract. For the 1850 Census, these fields include:

- first name
- last name
- age
- occupation
- birthplace

After defining these fields, the campaign creator prepares the Locator Data, which is in JSON format:


```
[
  {
    "state": "Minnesota",
    "county": "Washington",
    "page": "71B",
    "line": "29"
  },
  {
    "state": "Minnesota",
    "county": "Washington",
    "page": "71B",
```

```
    "line": "30"
  },
  ...
]
```

There is a piece of Locator Data for every line of the census. Each crowdsourcer will receive one of these when they request a data record to solve. This Locator Data is uploaded to Arweave in an NFT format, which is sequential to ensure each record has a unique identifier.

The Campaign Contract is then deployed, and the Arweave transaction ID is stored on-chain, linking the on-chain contract to the off-chain locator data.

2. Treasury Funding

Once the campaign is created, supporters can send ETH to the campaign's treasury. The treasury is deposited into a DeFi protocol to earn yield, ensuring that the campaign's funds grow over time.

3. Crowdsourcer Receives Locator Data

A crowdsourcer requests Locator Data through the Farcaster Frame. The data they receive may look like this:

```
{
  "state": "Minnesota",
  "county": "Washington",
  "page": "71B",
  "line": "29"
}
```

Using this Locator Data, the crowdsourcer finds the corresponding record in the census. They then enter the relevant details into the frame, such as:

```
{
  "last name": "Gleason",
  "first name": "Samuel",
  "age": "26",
  "sex": "M",
  "occupation": "Lumberman",
  "birthplace": "Ohio"
}
```

The Farcaster Frame guides the crowdsourcer with input fields for each data point, ensuring that they enter the information accurately.

4. Data Submission

Once all fields are entered, the crowdsourcer clicks Submit. The data is sent to the Crowdvouched platform, where it is temporarily stored and compared against other submissions for the same record.

If the crowdsourcer is the first to submit data for this record, it remains in the system for validation by a second crowdsourcer.

5. Validation Process

A second crowdsourcer is assigned the same Locator Data and follows the same steps, independently submitting data for the same individual.

Once two crowdsourcers submit identical data for the same record, the data is considered validated. The validated record is then written permanently to Arweave, ensuring it is stored securely and transparently.

6. Rewarding Crowdsourcers

Both crowdsourcers involved in validating the record are rewarded with USC1850 tokens. These tokens are minted upon successful validation and serve as rewards for their contributions. USC1850 tokens can be traded immediately after minting. Once the campaign is completed, USC1850 token can be redeemed for a share of the campaign treasury.

7. Campaign Completion

The 1850 Census campaign continues until all records have been digitized and validated. Once the entire dataset is complete, crowdsourcers can redeem their USC1850 tokens for a portion of the treasury, which has grown through donations, contributions, and interest from the DeFi investments.

Additionally, all validated data records can be minted as NFTs. The minting fee for these NFTs goes directly into the treasury, further increasing its value.