Revnets

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1 Introduction

Successful organizational frameworks have always been well-adapted to the technologies of their respective eras. In our current era of internet-native business and user-generated value, many frameworks have grown anachronistic, failing to optimally align participants:

1. Companies operating under a shareholder value model are obligated to prioritize profit-making, efficiency, and market competitiveness, even at the expense of their customers' interests. Companies often use funds from investors to undercut competition and secure a dominant market position, at which point they move to increasingly extractive revenue models to secure profits, trapping users in a more expensive ecosystem. Shareholder value models can also lead to misalignments between shareholder and employee interests—shareholders (particularly institutional investors and activist shareholders) tend to prefer shorter growth horizons over longer ones, compensation tied to stock performance over predictable salaries, and often support mergers and acquisitions even when disruptive, whereas employees tend to prefer the opposite. This time horizon mismatch often leads to conflicts over investments in R&D, training, and other long-term growth initiatives, contributing to the stagnation of larger companies which can fall behind smaller competitors.

2. Decentralized autonomous organizations (DAOs) pose an alternative, but frequently fall short in practice. Most DAOs begin with a core group of founders, developers, and entrepreneurs who aim to expand the DAO through progressive decentralization. Operating a DAO and pursuing decentralization is often time-consuming and resource intensive, and does not further the development of the end product. These projects can create a false sense of product market fit, where users will adopt a product with the hope of eventually receiving a token airdrop. Once this airdrop finally takes place, these users generally sell their tokens and leave the community. Progressive decentralization also disadvantages users and investors who must contend with the risk of misalignment, rugpulls, and scams while a core team holds significant power.

3. Stakeholder capitalism and triple bottom line models may be beneficial in theory, but frequently fail to align individual incentives and become difficult to enforce in practice.

Revnets utilize an alternative framework[1] under which wealth is programmatically exchanged over time from newer participants to older ones. Revnets incentivize investors, customers, and builders in the same way—debt is predictably passed from one generation of voluntary participants to the next. A Revnet's product may not be free, but the Revnet model drives consumer costs towards zero, or even profitability as the network achieves scale, meaning the network does not need to orient towards excessive retail extraction. Revnets are implemented as ownerless Ethereum smart contracts, removing the need for governance and making most kinds of rugpulls and scams impossible.

Under the shareholder value model, surplus is returned to investors, meaning employees and customers are sometimes inadequately incentivized. With a properly configured Revnet, all participants receive value according to their contributions: an increasing price to create more tokens rewards early purchasers who take

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[1] Retailism.

on more risk, a pre-defined token allocation rewards those who contribute to bootstrapping the network, and the market broadly rewards token holders according to their financial contributions and ability to grow the network over time.

2 Mechanism

Each Revnet issues its own token and accepts a specific currency, chosen during the network's creation. Anyone can pay a Revnet with the currency it accepts to issue the Revnet's tokens, and anyone can destroy those tokens to reclaim currency from the Revnet. For illustrative purposes, this section describes a network which accepts ETH and issues a $token.[2]

Under the Revnet's initial conditions, payers receive 1 $token per ETH. $token issuance evolves over generations which last a pre-defined length of time (1 day, for example). Three mechanisms determine how $tokens behave:

- The **Price Ceiling** is the ETH price to create new $tokens, expanding the $token supply. The price ceiling increases at a fixed rate each generation, making network expansion more expensive over time.

- The **Price Floor** is the ETH value that can be reclaimed from the network by destroying $tokens, contracting the $token supply. The price floor increases dynamically as the network contracts or expands.

- The **Price Window**. Liquidity can be added to a $token↔ETH market[3] at any time. While the $token's market price is between the price ceiling and price floor, $tokens are purchased and sold on the market. Otherwise, $token purchases and sales are fulfilled at the price ceiling or price floor, expanding or contracting the $token supply in response to demand.

In practice, Revnets issue $tokens at the price ceiling until a market forms between $tokens and ETH. From that point onwards, $tokens are purchased and sold on the market until the price reaches the price ceiling or price floor, at which point the $token supply will expand or contract to meet market demand. This stabilizes token prices, minimizing risk for participants.

After someone pays a Revnet, they can sell or destroy their tokens for a partial refund at any time. Revnets which route ongoing revenues from customers to the network allow buyers to choose between receiving a rebate for part of their purchase by destroying their $tokens immediately, or participating in the future growth of the network by holding their $tokens.

Revnets can specify a **boost** that directs a percentage of $tokens being purchased to a specific address, known as the **boost operator**, for a pre-determined length of time after the network's creation. While the boost is active, the boost operator can route percentages of the boost to the addresses and Revnets of their choosing, but only up to the pre-defined boost percentage (i.e. the operator cannot increase the percentage of tokens being routed to the boost). Revnets also have the option to pre-mint an arbitrary number of $tokens to the boost operator upon the network's creation. The boost operator could be a core team or developer multisig, but it could also be a staking rewards contract, an airdrop stockpile, or something else.

Once a Revnet is deployed, all of its parameters are locked in place.

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[2]Revnets can accept and denominate prices in other currencies. See Section 5.1.

[3]Our initial implementation uses a Uniswap v3 liquidity pool.

2.1 Price Ceiling

The cost to expand the $token supply increases over time. This is done by reducing the number of $tokens issued per ETH with each passing generation. This reduction is dictated by a price ceiling function, which compounds at a rate r_c set by the network's creator. The price ceiling function[4] can be expressed as:

$$T_n = T_1 \cdot (1 - r_c)^{(n-1)} \tag{1}$$

where:

- T_n is the number of tokens issued per ETH in the nth generation,

- T_1 is the number of tokens issued per ETH in the first generation,

- r_c is the price ceiling curve, or rate of decrease per generation (expressed as a decimal), and

- n is the generation number, which increments sequentially starting from 1.

Since Revnets have a T_1 (initial price) of 1 $token per ETH, this can be simplified to:

$$T_n = (1 - r_c)^{(n-1)} \tag{2}$$

The price ceiling encourages participants to join the network early. The earlier a participant joins, the more $tokens they receive for their ETH.
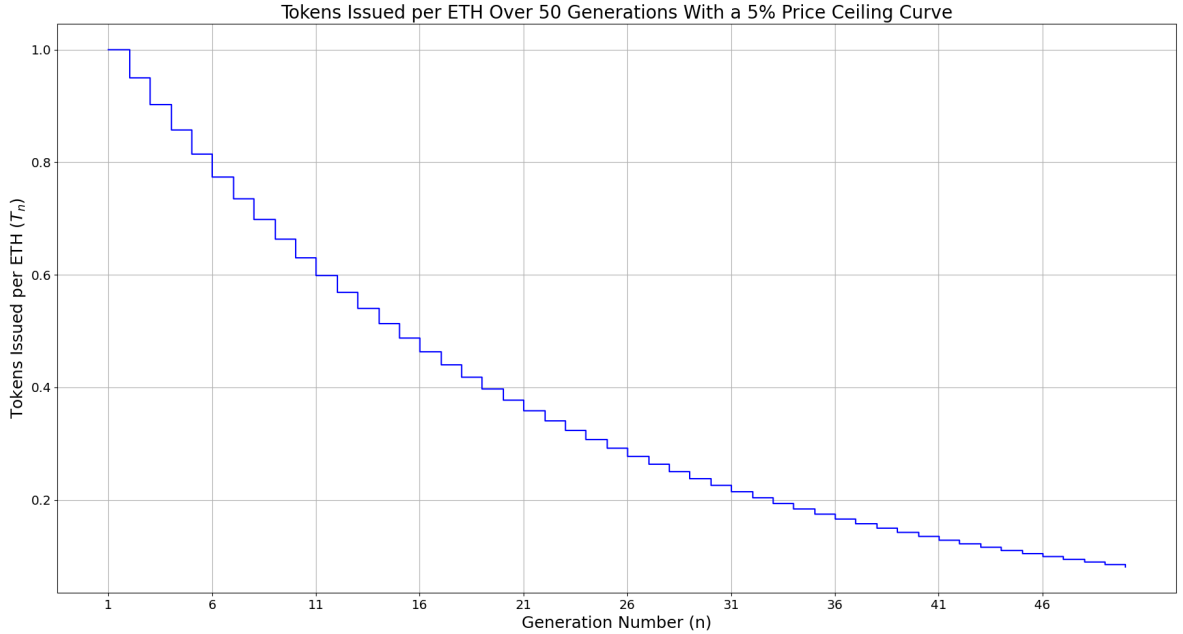

Figure 1: This figure shows how T_n (the number of $tokens issued per ETH in the n^{th} generation) varies across 50 generations with a 5% price ceiling curve ($r_c = 0.05$). Note that T_n decreases rapidly at first, then more gradually as T_n tends towards 0 over many generations.

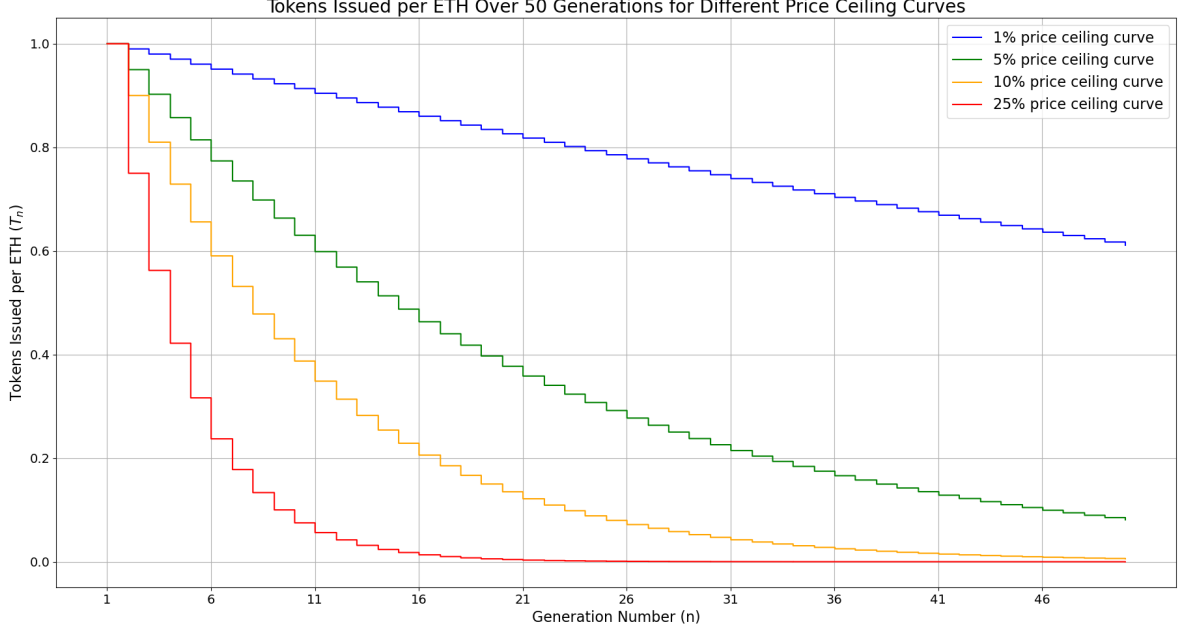[4]Also see the interactive price ceiling function on Desmos.

Figure 2: This figure shows how T_n varies over 50 generations with 1%, 5%, 10%, and 25% price ceiling curves ($r_c = 0.01, 0.05, 0.1, 0.25$). Note that for greater price ceiling curves, T_n tends towards 0 more quickly.

2.2   Price Floor

Anyone can destroy their \$tokens to reclaim ETH from the network. The amount of ETH they can reclaim is determined by the price floor function, which is dynamically calculated based on a price floor curve r_f set by the network's creator, the total \$token supply, and the amount of ETH in the network. Unless the price floor curve is 0 ($r_f = 0$), destroying $n\%$ of tokens will reclaim less than $n\%$ of the network's ETH.[5] This "exit tax" keeps more ETH in the network, increasing the amount of ETH which can be reclaimed by other participants.

The price floor function[6] can be expressed as:

$$V_r = \frac{V_t \cdot x}{s} \left((1 - r_f) + \frac{r_f \cdot x}{s} \right) \tag{3}$$

where:

- V_r is the ETH value which gets reclaimed,

- V_t is the total amount of ETH in the network,

- s is the total \$token supply,

- r_f is the price floor curve (expressed as a decimal), and

- x is the number of \$tokens being burned.

Unless r_f is 0, as more \$tokens are destroyed (in other words, the larger x is), more ETH is reclaimed per token.[7] This means the first participants to destroy their \$tokens receive less ETH per \$token than participants who destroy their \$tokens later. This incentivizes participants to stay in the network longer in order to increase the amount of ETH they can reclaim.

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[5] Except for when $n = 100\%$

[6] Also see the interactive price floor function on Desmos.

[7] If r_f is 0, the price floor function will be linear, and each \$token will yield the same amount of ETH when destroyed.
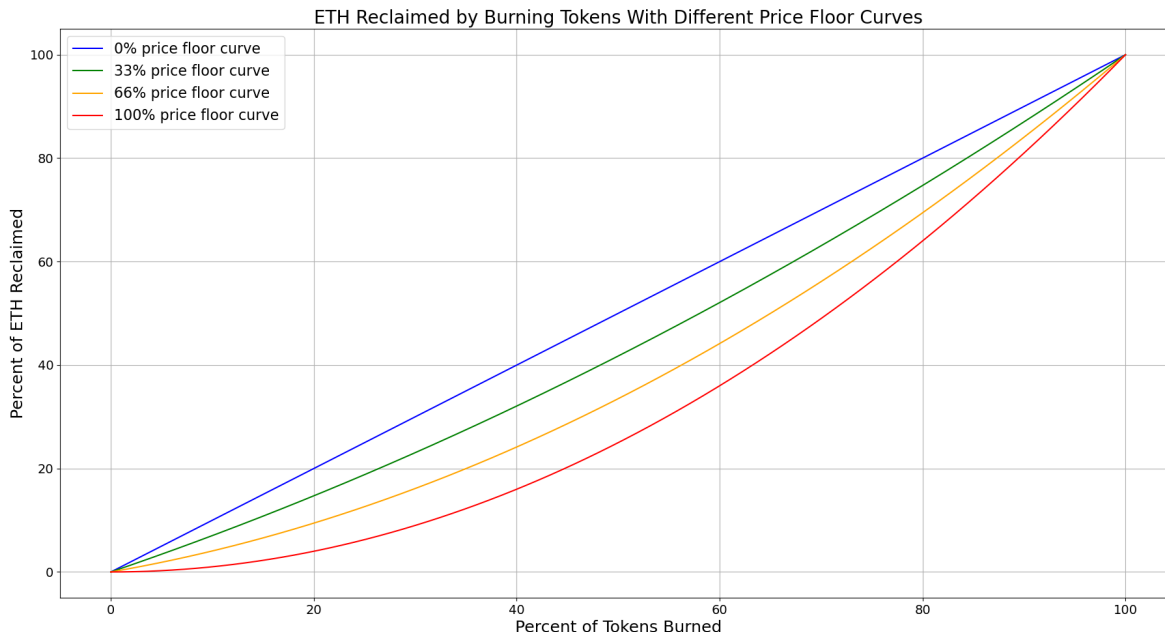
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Figure 3: This figure shows price floor functions with price floor curves of 0%, 33%, 66%, and 100% ($r_f = 0, 0.33, 0.66, 1$). The x axis represents the percentage of the total \$token supply being destroyed, and the y axis represents the percentage of the network's ETH which is reclaimed. Note that with a 0% price floor curve ($r_f = 0$), reclaim amounts scale linearly with respect to the number of tokens being destroyed—a network participant which destroys 1% of the total token supply receives 1% of the network's ETH. The larger the price floor curve r_f, the less ETH earlier reclaimers receive.

For a participant to maximize their financial return under the shareholder value model, they must "time the market", selling their equity in a company at the time when the market considers it to be most valuable. This may not line up with the company's intrinsic value, as markets frequently overvalue or undervalue companies based on social trends, investor hype, and other extrinsic factors. In contrast, *the greatest loss a participant can incur under a Revnet model is the difference between the price ceiling and price floor at the time they purchase \$tokens*. As \$tokens are created or destroyed, the price floor will continue to rise. Participants do not have to worry about the value of their tokens going to zero, and in most cases, to maximize their return, they only have to continue holding their tokens. It is far easier for participants to be "rational market actors" under a Revnet model, encouraging long-term participation.

3 Applications

Revnets can receive funds from token purchasers or from ongoing revenues. In practice, most Revnets will likely rely on token purchases to bootstrap early development, and transition to sustainable funding from revenues as the Revnet launches their product and achieves scale. Because of the bounds on the price window, Revnet token prices are generally stable and predictable, making them useful for projects with a long-term orientation. Revnets can leverage their boost to encourage early growth of the network and overcome the "cold start" effect new ventures often encounter. Revnets are particularly beneficial for applications that leverage network effects, where the service or product's value increases with greater participant involvement. Revnets are most capable of accomplishing complex coordinated tasks while the boost is active and can be strategically deployed by the boost operator.

Revnets excel in scenarios where individual contributors, even when isolated, can meaningfully contribute to the end product. An anonymous individual can write pages for an online encyclopedia or provide reviews for local businesses, making it feasible to coordinate hundreds or thousands of contributors to a project.

Revnets are not as well-suited to endeavors which require ongoing support from a centralized, hierarchical structure. For instance, a Revnet would likely struggle to compete with a large-scale manufacturing company or to orchestrate the construction of complex infrastructure projects.

3.1 Overcoming Existing Network Effects

In spaces where products rely on user-driven network effects, newcomers often struggle to secure market share. Even when a newcomer has a technically better product, it is difficult to compete with established networks of users and content. This problem reinforces itself: a newcomer's lack of users makes their product or platform less useful, making it harder to attract users. This cold start problem can be overcome with a properly configured Revnet which incentivizes early users.

Google Maps is popular, but comes with several downsides: it is proprietary, its API is expensive, it has limited offline support, and it lacks data privacy. OpenStreetMap, an open-source alternative, addresses many of these concerns, but lacks in user-generated reviews and address labels, making it impractical for most. If OpenStreetMap or a project like it were to use a Revnet model, early participants would receive more of the Revnet's tokens, incentivizing them to leave more reviews and label more addresses. The boost could also be deployed to reward early contributors. If well-executed, this could generate enough content to make OpenStreetMap a viable option for users who care about data privacy or offline support—those users would continue to generate content, and eventually OpenStreetMap could gather enough data to be a viable option for all users.

Similarly, alternative social media platforms, such as Mastodon, and protocols like XMPP or Gemini could effectively generate early network momentum as Revnets. These Revnets wouldn't necessarily have to monetize the platform or protocol themselves—in line with existing corporate models, they could derive revenue from advertising or the sale of premium services and products, such as web hosting or educational resources.

Currently, network effects are often overcome by using investor funding to subsidize a product, undercutting competition. Once these products secure a dominant market position, prices are increased, trapping users in a more expensive ecosystem. Revnets provide an alternative to this model, driving the cost per consumer down, or into profitability as the network achieves scale.

3.2 Governance

Revnet tokens adhere to the `ERC20Votes` standard, meaning they can be used in conjunction with governance tools like Snapshot and Governor Bravo for offchain or onchain token voting. Importantly, Revnet governance cannot control the allocation of the network's funds, as funds only leave the network according to the Revnet's pre-defined rules. This means Revnets are not subject to a wide range of governance attacks, hostile takeovers, and misaligned incentives which affect DAOs and other governance structures. Revnets can effectively govern DeFi protocols, software projects, and other efforts across distributed communities. Revnet mechanisms encourage long-term orientation and distribute tokens accordingly, encouraging favorable governance outcomes.

3.3 Gated Networks

Ethereum wallets offer straightforward sign-in support for web applications, making Revnets a strong fit for token-gated platforms. Since participants have access to the growth of a Revnet-driven platform, they're more likely to use the platform and recommend it to others. This is a major advantage for platforms which rely on user-generated content:

All else being equal, users are more likely to put value into a platform which allows them to receive a portion of future growth over one which doesn't. Community ownership also prevents the platform from switching to a more extractive business model once it achieves scale, a frequent misalignment between users and platforms. Individual content creator can also deploy Revnets, and allow token holders to access exclusive material. Content creators can also use token voting to guide the direction of future projects.

Category	Examples
Traditional social media.	Twitter, Instagram, and Facebook.
Forums and real-time chat services.	Reddit, Discord, and IRC.
Video and streaming services.	YouTube, Soundcloud, and Twitch.
Review and rating platforms.	Yelp, TripAdvisor, and Rotten Tomatoes.
News and Blogging platforms.	Medium, Mirror, and Tumblr.
Open or volunteer research and science.	Folding@home, BOINC, and LHC@home.
DeFi platforms which rely on user liquidity.	Uniswap, Compound, and Stargate.

4   Securities Laws

The legal status of Revnets and similar models can vary significantly by jurisdiction. This section provides a general overview and does not constitute legal advice. The legal landscape for cryptocurrency technologies is still evolving, and future regulations could impact Revnets.

On July 13th 2023, U.S. District Judge Analisa Torres ruled that Ripple Labs' "programmatic sales" of XRP did not violate federal securities laws. From the ruling[8]:

> Ripple's Programmatic Sales were blind bid/ask transactions, and Programmatic Buyers could not have known if their payments of money went to Ripple, or any other seller of XRP... Ripple did not make any promises or offers because Ripple did not know who was buying the XRP, and the purchasers did not know who was selling it.

This ruling could apply to transactions involving a Revnet's tokens. Revnet token buyers do not know whether their payments are going to the Revnet itself or to a liquidity pool, and they do not know which future redeemer will receive their funds, meaning these transactions could be considered blind bid/ask transactions. If the Ripple Labs case ruling is upheld, these transactions would likely not violate securities laws in the United States.

5   Contract Implementation

Revnets are implemented as Solidity smart contracts, and are intended for use on Ethereum and L2s. Revnets extend the Juicebox[9] protocol, leveraging its discount rate logic for price ceiling calculations, its redemption logic for price floor calculations, and its reserved rate logic for boost calculations.

While a Revnet's token price is between its price ceiling and price floor, payments are routed to a Uniswap v3 liquidity pool by a Buyback Delegate[10] contract if possible. The Buyback Delegate contract routes incoming payments to the Uniswap pool if doing so would yield more tokens than a payment into the network would create.

Each Revnet is a Juicebox project, which is deployed, owned, and administered by a deployer contract. Our initial implementation includes a basic deployer, a deployer which includes pay delegates[11] to be called when the Revnet is paid, and a deployer which allows the Revnet to mint tiered ERC-721 NFTs when people pay it. These deployers are available on GitHub.

5.1   Accounting Types

Revnets have the option to use USD-based accounting based on a Chainlink ETH price oracle. With USD-based accounting, payers receive 1 network token per USD worth of ETH under the network's initial conditions. For instance, if the ETH price is 1,000 USD, paying 1 ETH into the network will create 1,000 tokens. Revnets can manage accounting with any price feed available on the `JBPrices` contract.[12]

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[8]Securities and Exchange Commission v. Ripple Labs Inc., No. 1:20-cv-10832 (S.D.N.Y. Jul. 13, 2023), ECF No. 874.
[9]See the Juicebox Docs.
[10]See the Buyback Delegate contracts on GitHub.
[11]See the delegate documentation.
[12]See the `JBPrices` documentation.

5.2 L2s

Revnets communities will be able to utilize a collection of contracts to route funds between and coordinate across Ethereum mainnet and L2s. These contracts are currently under development and are available on GitHub.

6 Conclusion

Revnets introduce a promising new growth model, with intrinsic incentives for early participation and enduring engagement. Utilizing unowned smart contracts, they avoid many of the trust and governance hurdles often faced by DAOs and other frameworks. By establishing a predictable token economy with a clear mechanism for value distribution and appreciation, Revnets enable sustainable user-centric networks. This model is particularly well-suited for ventures which thrive on network effects and community engagement, offering a solution to the cold start problem that many new ventures encounter.

With a predictable price ceiling, floor, and window, Revnets promote long-term participation and reduce, or often even benefit from the adversarial impact of market speculation which frequently impacts other token economies. Their utility extends beyond just being a medium of exchange or a store of value—they act as a catalyst for a wide range of community-driven platforms. In a digital age where user-generated value is essential to network growth, Revnets could play a pivotal role in redefining how value is created, distributed, and sustained. Through Revnets, we envision a future where the divide between users, builders, and investors is blurred, and where communities drive the value and direction of the networks they belong to.