VERSION 1.04
OCTOBER 2017
VERSION 1.0 RELEASED JUNE 2017

PARETO

WHITE PAPER

Eric Lamison-White, Ted Lanpher

"For many events, roughly 80% of the effects come from 20% of the causes"

— Vilfredo Pareto

INTRODUCTION.

The Pareto Network is a service for incentivizing the generation and sharing of information about tradable opportunities in cryptocurrencies and related assets. It is designed to elevate information about market inefficiencies and promote more accurate price discovery. What that means is that it should steer the markets toward the correct pricing of these assets.

It replicates the function of research desks at investment banks, providing a flow of information that anyone can access, and aligns economic incentives to promote that reality.

BACKGROUND.

The current state of investment research for cryptocurrencies is cumbersome and leaves a lot to be desired.

Cryptocurrencies differ measurably from conventional equities or forex as a subject of investment analysis. An assessment of the viability of a new currency or token typically requires an evaluation of an open source software project, a proposed model of a decentralized market, a design for new forms of economic incentives and behavior, and other considerations such as the long-term viability of the blockchain or protocol stack within which the token resides.

In combination, these differences create an investment challenge that defies the simple application of existing investment information tools, which are centered on the analysis of balance sheets, P&L statements, and commercial transactions under GAAP accounting as well as projections of factors such as market share, sales and profitability into the future. Moreover, the investors in crypto markets are less likely to have access to conventional sources of equity or forex research.[1] [2]

Confounding these challenges is the rapid pace of new token and cryptocurrency offerings. As of July 2017 over 800 cryptocurrencies are available to investors and it is likely that as many as 1,000 new token/currency offerings will occur over the next year alone. This will doubtlessly include tremendous opportunities for investors. But the large number of choices presents a bewildering landscape. Investors will be challenged to differentiate between these opportunities and seek tools to help devise and implement an investment and allocation strategy.

---

[1] Conventional research performed by investment banks and buy side analysts has undergone a dramatic decline since the financial crisis of 2009, dropping nearly 50%. This appears to be related to the reduction in advisory fees and more recently, regulation in the European Union requires the separation of customer charges for research expense from brokerage service fees. Banks Forced to Shake Up Analyst Research Business, Wall Street Journal, Feb. 2015. https://www.wsj.com/articles/new-rules-poised-to-reshape-analyst-research-sector-1423514292

[2] Robin Wigglesworth, Final Call for the Research Analyst?, Financial Times, February 7, 2017. https://www.ft.com/content/85ee225a-ec4e-11e6-930f-061b01e23655

Today, finding information on investment in the cryptocurrency space is often a fairly random process. The major sources include:

- YouTube channels, of which some are affiliated with specific cryptocurrencies. Most of these channels have between 5,000 and 25,000 subscribers. The quality of the production and the advice offered varies widely.

- Industry news sites such as CoinDesk, The Merkle, Bitcoinist, CoinTelegraph, and numerous others provide news stories on the overall market direction, notable transactions and events, press releases, individual currencies, and other developments.

- Research reports on new tokens such as Smith & Crown. Some of the reports are more extensive than others and many tokens have no objective reviewers. Much of the information in these reports at this point in time appears to come from the issuer's white paper and other material provided by the token creators themselves.

- Bloggers, including personal blogs (often on Medium) and blogs on the sites of Foundations, venture investors, and thought leaders. While some of these writers offer valuable insights these blogs are not centralized or organized in a way that makes it practical to effectively consume such insights.[3]

- Exchanges and market data sites: Price and volume, bid and ask data from exchanges including historical charts. Coinmarketcap.com, Poloniex, Bittrex, and others. Some provide data via APIs (such as coincap.io).

- Blockchain explorers, such as Blockchain.info and Etherscan.io, which contain information on the concentration of holdings and the volume and pace of transactions.

[3]An example is the writing on blockchain protocol economics of Joel Monegro at Union Square Ventures. https://www.usv.com/thread/blockstack

- Forum Posts. One of most potentially valuable sources of actionable insights is the forums focused on individual currencies. These include the Slack Channels of the Currency's developer or foundation themselves as well as discussion areas focused on crypto within various open forums such as BitcoinTalk, Reddit and StackExchange.

- Steemit provides a useful source of advice and forecasts and may include a compensation-feedback mechanism. However, their broad focus on social sharing of information about "almost anything" leads to a more diffuse stream of information.

PHILOSOPHY.

The Pareto platform and ecosystem aims to create value through increasing the overall efficiency of cryptocurrency markets. The Platform has several aspects to detail:

Prospective users of the Pareto Network must own Pareto tokens (PXT) in order to access the Pareto Network. By means of its rewards mechanism, the Pareto Network encourages the production of actionable market information and helps Pareto token users filter noise from meaningful information.

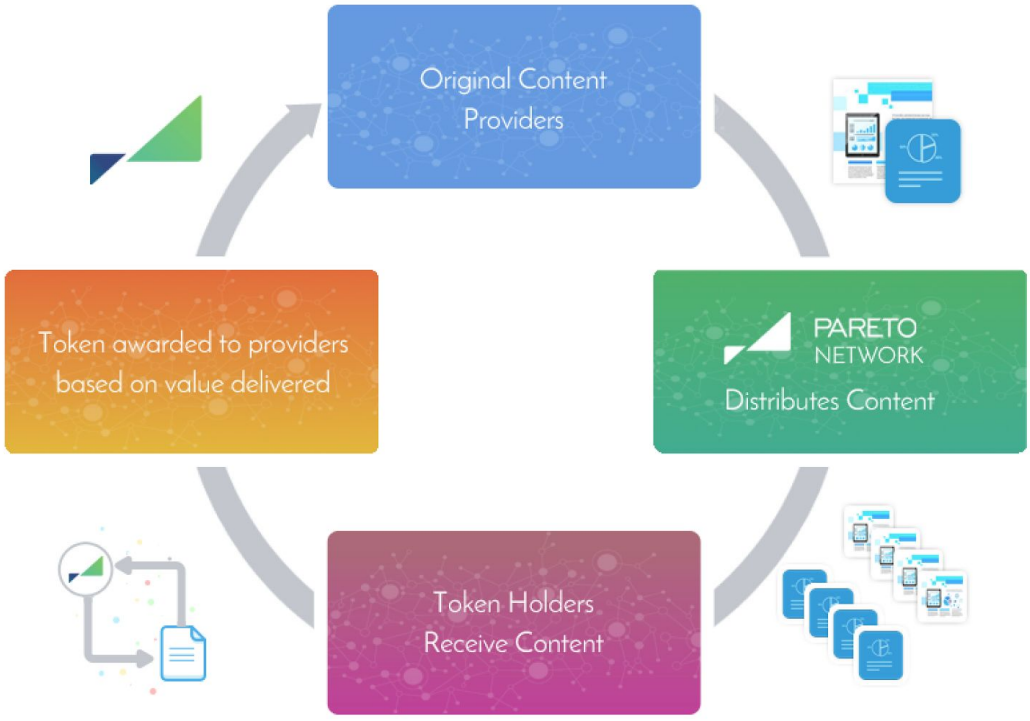
More subtly, through its taxonomies and organization of information feeds, the Pareto Network will play a role in structuring the types of information produced and advance the level of understanding of cryptocurrency investment analysis.

The infrastructure of the Pareto Network was designed after researching the ideals, shortcomings and advantages of other blockchain token offerings over the last half a decade. Failing to address or align the economic incentives of the target market participants hampered the execution of many projects.

The philosophy of the Pareto Network can be extended to existing and future crypto-asset offerings to attract capital to this space and realize the shared ideals of evolving the finance sector and the world around it by proxy.

PLATFORM OVERVIEW.

The Pareto Network will facilitate the growth of an ecosystem for the creation and distribution of content related to investment in crypto assets.



Original Information Content

The Pareto Network will ingest and distribute a broad range of information that may be of value to its participants in making investment decisions in the cryptocurrency markets. Such information will include (but is not limited to) the following:

- Analyst reports – coverage of new & existing tradable tokens or investments

- Sector reports (e.g. storage, prediction, computing)
- Analyst reports on return on staking/mining
- Technical trading alerts and reports
- Codebase reviews
- Code vulnerability and security assessments
- Evaluation of investor tools
- Evaluation and discussion of fund management tools
- Crypto investment manager surveys

Content Contributors

Content contributors (Content Contributors) may be individuals, groups or organizations. They may generate single items of information or multiple items produced over time. They may generate ongoing streams of information.

There will be two phases to adding content contributors. During the first phase, Pareto will recruit qualified contributors to start building a flow of information that can be used immediately by token users.

In phase two the contributors will grow organically, as the contributors will be drawn to the Network; they will be incentivized to add content to earn rewards and PXT tokens from users.

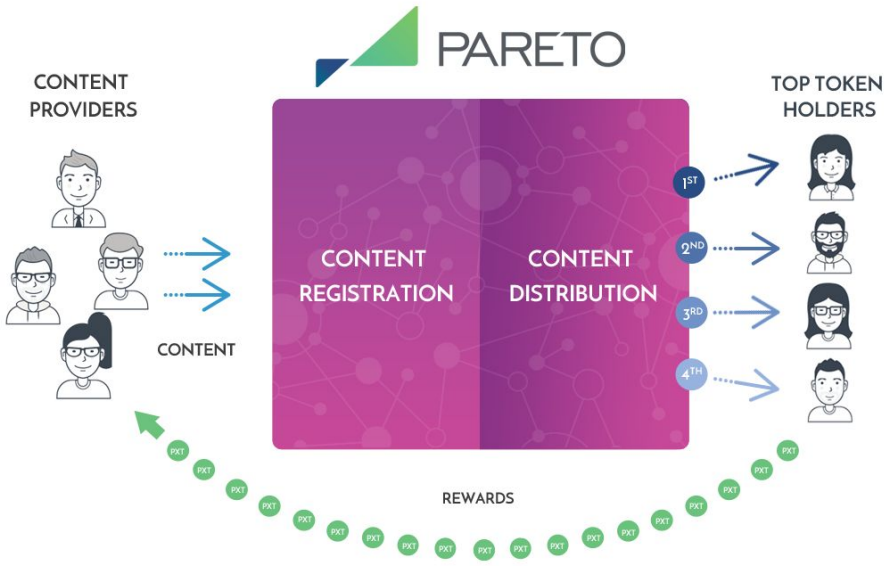
Submissions of content to the Pareto Network are open to anyone. Content Contributors will generally be required to purchase some number of Pareto Tokens as to deter spam or other inappropriate or irrelevant content.

INCENTIVES & REWARDS.

The Pareto Network uses a ranking algorithm to determine the order in which Pareto token users are provided with the information created by the Content Contributors. The outcome of the ranking algorithm is called the waterfall, and it is akin to a leaderboard.

There are a variety of criteria which have an influence on a user's position within the waterfall and these can be used strategically to obtain information sooner than other users.

Content Contributors are likewise incentivized to create content which can be actionable amongst the users as well as compete for the optimal kind and price of information for the Pareto Network.



1. Content Contributors submit content to Pareto Network
2. Pareto Network distributes the content to Token Users in a prioritized sequence
3. To maintain or improve their position on the waterfall, Token Users award PXT to Content Contributors. Users that do not spend their tokens, or attempt to use Pareto

tokens for speculation, are at a disadvantage by not maximizing their place in the network. Tokens are awarded to Content Contributors – this supplements direct rewards from Pareto Network

The generalized formula for a user's ranking is as follows:

$$(\sum_{P=0}^{B_{n-c}} Address(P)) \times (B_{n-c} - (1/n \sum_{i=1}^{n} \alpha^i)_P)^V$$

where

$$V = 1 + (\frac{x/M}{2})$$

and

$$x \geq 0,\ x = \sum_{v=0}^{B_y} v,\ x \leq 2$$

Definitions:

Address	The signed address containing Pareto tokens
P	A quantity of Pareto tokens
B	Block height. The total number of blocks till the top of the blockchain. B_n is the current block height. B_c is the confirmed bloc height. "c" can be set by the Pareto system based on the perceived confidence in consensus of the host blockchain.

	B_y is the lowest block used by the Pareto system to determine how many rewards a user has made. Rewards eventually stop being counter for a user's ranking.
M	The weighting of the total number of rewards. For example, with a weighting of 50 and an eligible reward count of 1, the rewards would be worth .02 in the system, allowing for 100 eligible rewards to obtain the maximum exponential effect to a user's ranking. Whereas a weighting of 100 would make rewards worth .01 in the system, allowing for 200 eligible rewards to obtain the maximum exponential effect.
V	This is a representation of the rewards algorithm.
v	A reward.
x	Number of rewards a Pareto user has made since the lowest counted block.

Step by Step:

In its simplest form, the algorithm is counting how many Pareto tokens a user owns, how long they've held tokens, and how many Pareto tokens they have spent by paying content contributors. The largest benefit comes from spending the tokens on content contributors, creating a virtuous circle of incentivized information that benefits the users of Pareto tokens. The algorithm penalizes speculative purchases of the tokens.

$$\sum_{P=0}^{B_{n-c}} Address(P)$$

A summation representing a count of how many Pareto tokens are in an address.

The Pareto Network uses a block explorer to check how many Pareto tokens an individual address has, starting from 0 tokens, until a system specified number of confirmations away from the greatest block height.

$$B_{n-c} - (1/n \sum_{i=1}^{n} \alpha^{i})_{P}$$

A user is incentivized to replenish Pareto tokens that it spends because a higher average holding of Pareto token over time positively affects its ranking in the Pareto Network. Users with a higher ranking receive information sooner than users with a lower ranking.

This is Pareto Network block height minus the weighted average block height that an address holds Pareto. It is a weighted average of amount of Pareto per block.

$$V = 1 + (\frac{x/M}{2})$$

and

$$x \geq 0,\ x = \sum_{v=0}^{B_y} v,\ x \leq 2$$

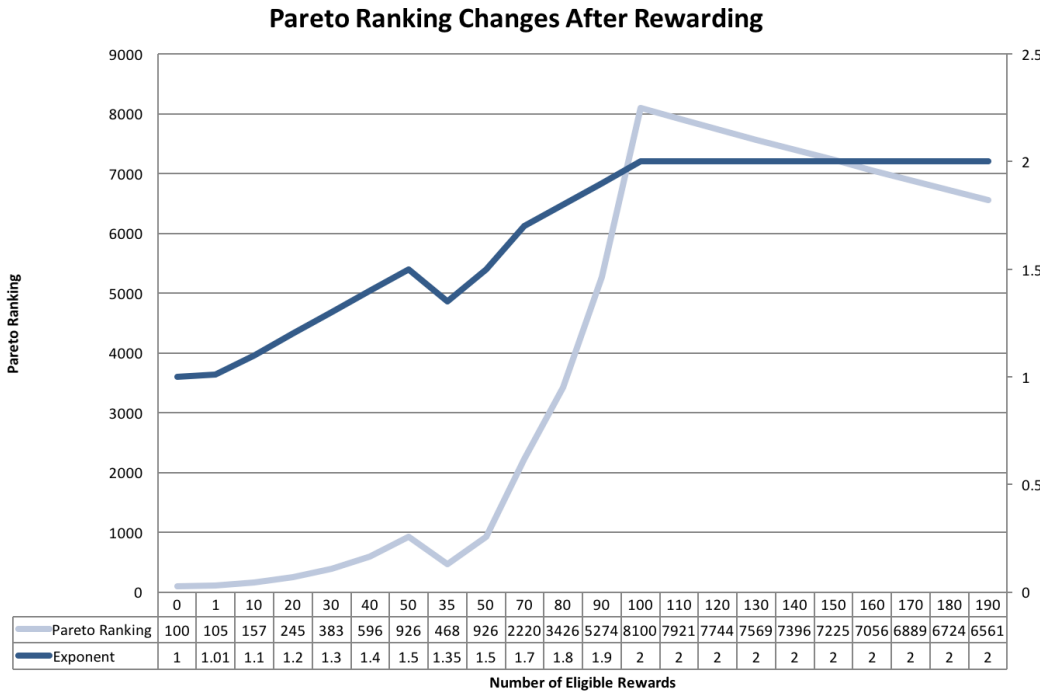
V is an exponent, which is currently set to 1 for all users. The reward mechanism is a way to both compensate contributors and also boost a user's ranking, exponentially.

V can be as low as 1, and can be as high as 2. With enough rewards (little v) a user can exponentially double their

ranking for a temporary time period, giving them enhanced access to more information sooner. This provides an incentive for users to reward a Content Contributor after receiving profitable information.

Rewards have a cost in Pareto tokens, set by Content Contributors, and this cost is paid directly to the Content Contributor. Rewards stop being counted for this exponent after a certain number of blocks, readjusting the ranking of users and incentivizing them to continue acting on profitable information, and having a desire to get this profitable information sooner.

As rewards modify an exponent on a user's ranking formula, it should become clear that spending Pareto tokens on rewards is the best way to increase a user's ranking in the Pareto Network. Thus, users are incentivized to reward, which results in payments to Content Contributors. The following visualization is meant to illustrate the dramatic possibilities and upper bound limitations of rewards in the ranking algorithm.

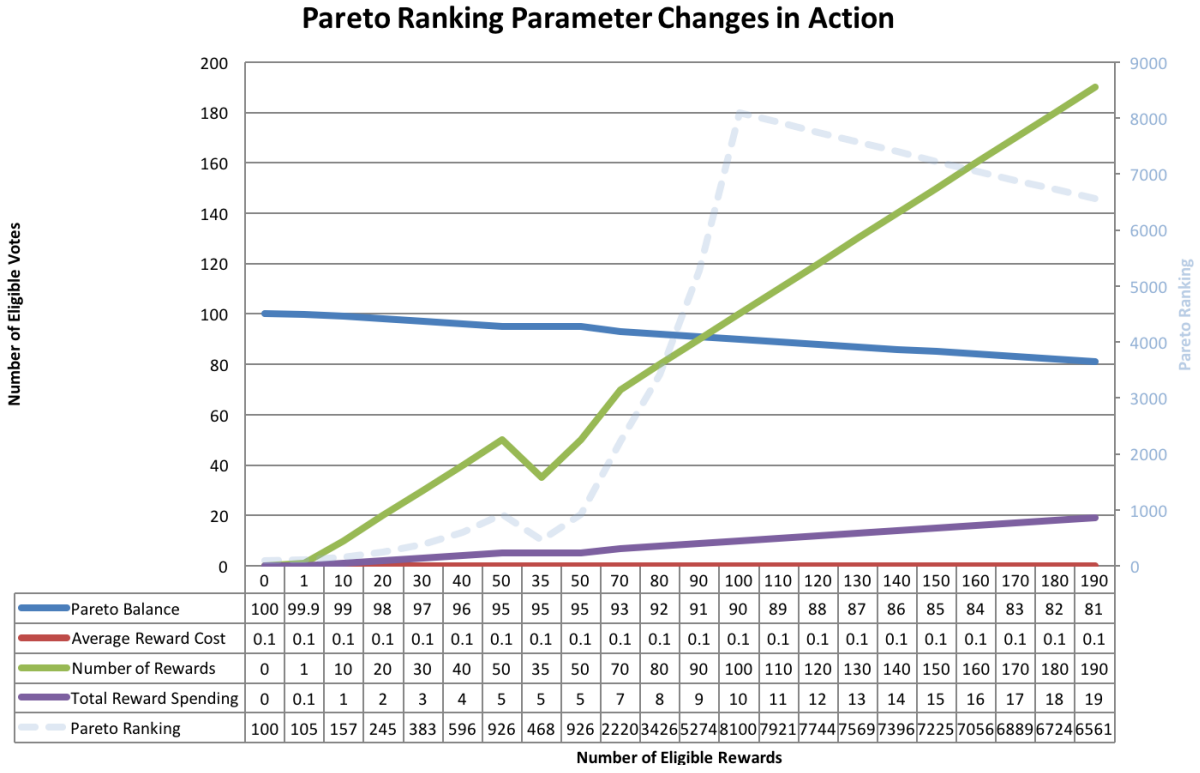


	0	1	10	20	30	40	50	35	50	70	80	90	100	110	120	130	140	150	160	170	180	190
Pareto Ranking	100	105	157	245	383	596	926	468	926	2220	3426	5274	8100	7921	7744	7569	7396	7225	7056	6889	6724	6561
Exponent	1	1.01	1.1	1.2	1.3	1.4	1.5	1.35	1.5	1.7	1.8	1.9	2	2	2	2	2	2	2	2	2	2

In this example, the user started with a balance of 100 PXT, the user never acquired additional PXT but is spending their PXT balance on rewards with an average cost of .1 PXT each. Suggested reward cost can be set by the Content Contributors and they will find an equilibrium of what a practical amount is.

This example assumes that all of PXT were acquired at the same time. As such, this example exists in a vacuum and neglects other user's rankings against this user's, as well as any repurchases this user might have made to improve its ranking.

The interplay for the individual user is further illustrated in an accompanying graph revealing the data used in the ranking algorithm.



	0	1	10	20	30	40	50	35	50	70	80	90	100	110	120	130	140	150	160	170	180	190
Pareto Balance	100	99.9	99	98	97	96	95	95	95	93	92	91	90	89	88	87	86	85	84	83	82	81
Average Reward Cost	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Number of Rewards	0	1	10	20	30	40	50	35	50	70	80	90	100	110	120	130	140	150	160	170	180	190
Total Reward Spending	0	0.1	1	2	3	4	5	5	5	7	8	9	10	11	12	13	14	15	16	17	18	19
Pareto Ranking	100	105	157	245	383	596	926	468	926	2220	3426	5274	8100	7921	7744	7569	7396	7225	7056	6889	6724	6561

The user's Pareto token balance dropped from 100 to 80 but its ranking actually increased due to the reward pattern.

The Pareto Network is designed to promote payment to the Content Contributors, motivated by upward movement in the ranking.

The summary of user behavior is based on the users receiving profitable information, rewarding Pareto tokens to the Content Contributor for the information, and moving up the ranking to receive profitable information sooner.

Where does the Pareto Token value come from?

Pareto tokens are as valuable as the information in the Pareto Network is, or as valuable as future information in the Pareto Network is perceived to be.

Pareto tokens are required to access the Pareto Network. Spending tokens by paying Content Contributors is the best way to move up in the rankings to receive the information available in the Pareto Network sooner. Thus, Pareto tokens represent the cost to the user of accessing the Pareto Network and receiving its content at the optimal time relative to other users.

People are incentivized to put information into the Pareto Network because they can earn more from distributing the information than from acting on the information themselves. Analysts and engineers typically do not have the capital or infrastructure necessary to most effectively take advantage of nuanced information. Aside from finding the people with capital, negotiating the most favorable incentives is a minefield and the information's actionable time period is short lived. Finally, many forms of privileged information have increased liability if it is acted upon.

DIFFERENCES FROM PREDICTION MARKETS

Prediction markets rely on the wisdom of the crowd, promoting a binary side bet that something will or will not happen, or that opposites will happen. It is meant to aggregate all available information to determine what team will win, who will win an election, and other forms of binary events. The purpose is to create a limited incentive for people to put money behind a decision they believe in. The limitation comes from both the kinds of information that can be applicable to a prediction market, and the information available to the crowd to begin with. Finally, markets may not form at all outside of the biggest events already in the collective conscious, exacerbating an already irreconcilable liquidity problem.

There are many circumstances to suggest that there is no wisdom of the crowd, such as in the options markets and in elections, yet prediction markets do not provide a liquid enough venue to make contrarian decisions. The liquidity concern is proportionate to the funds available to other bettors, whereas expert provided information is the only form of liquidity in the Pareto Network. The cryptocurrency financial markets are not transparent enough for the whole market to make rational decisions, and the market participants are not rational to begin with.

The market consistently discounts improbable situations, and this is reflected in prediction markets.

The Pareto Network provides an incentive to disclose the improbable. This results in enabling as many people as possible to make profitable investment decisions in the relevant markets before non-users, based on real-time information they obtain from the Pareto Network. The users are in turn incentivized to compensate the Content Contributors with Pareto tokens, as that action improves their ranking on the Pareto leaderboard and allows those people to get the next information disclosure sooner.

CASE STUDIES.

Details of a double spend vulnerability on a small cryptocurrency may be worth several million dollars.

A double spend allows someone to inflate the supply of the cryptocurrency and create money out of nothing, with no consequence socially or legally. Confidence in cryptocurrencies comes from the ability to prevent that, and smaller cryptocurrencies are not as secure as bigger ones for a variety of reasons.

In April 2017, the Monero team discovered vulnerability in the underlying Cryptonote protocol which affected Monero, Boolberry, Bytecoin DigitalNote, AEON and a handful of other cryptocurrencies. The Monero team disclosed it to perhaps a dozen software engineers so that they could fix the vulnerability in private, before an inevitable scheduled public disclosure a month later.

By the time of the public disclosures, it would be expected that the problem would have already been fixed. After the public disclosure it was shown that the exploit was executed on Bytecoin. Over $1.6 million worth of Bytecoin was created and sold during the time of the private disclosure. This required already owning a lot of Bytecoin (capital), understanding how to execute the vulnerability (deeply technical knowledge), and having the knowledge during a short time frame.

Having all three of those advantages is difficult and unlikely. The Pareto Network makes it easy to monetize this kind of information. The engineer would input the details into the Pareto Network and the best positioned users of Pareto could act on this information and encourage the engineer for continued disclosures. The action of payment allows the Pareto token user to be privy to more information faster, as it improves their ranking in the Pareto Network's leaderboard. Pareto token users who are higher in the leaderboard will receive information before people lower in the leaderboard.

Details of a central bank policy decision can be worth several billion dollars.

George Soros is infamous for "breaking the Bank of England", as he predicted that the central bank artificially kept the exchange rate of pounds at a price that nobody was willing to pay. The British government only had £27 billion worth of property (metals, foreign currencies) that it could use to buy pounds on the open market in a massive bid to prop up the exchange rate.

George Soros went short on the pound with $15 billion, and the rest of the market followed his lead *as they caught onto what was going on.* That day, the British government tried to raise interest rates twice, hoping that rich foreigners seeking yield would also buy more pounds, since the government only had £27 billion to buy with to support the price and the global market was selling much more into it.

Unfortunately, this was during the middle of a recession, raising interest rates did not increase interest in the pound, and it was career suicide for politicians to raise interest rates in a struggling economy, so the government had to abandon its taxpayer funded bid as it was a horrible speculative trade of their own currency and mismanagement of the state trading fund (British Treasury). George Soros' fund made $7 billion in a highly leveraged trade, as the British Pound plummeted 25% over a few days. All British taxpayers lost as they transferred their wealth out of the Treasury to George Soros' hedge fund, and had to deal with higher prices of food, services and imports afterwards.

To have received information and made a similar trade with similar results would have required the necessary information in a timely fashion. There may have been those that could have provided this information, but they would have required a number of resources to accomplish the dissemination of this information. The biggest and most difficult resource needed is the capital required to get the information out to the masses. In this scenario, many people could have done the math, but not have had any way to monetize the information or the trade. In the Pareto Network, the information about this trade could have come from anyone with a passive interest in economics including:

- A student studying in University who has limited income or possibly massive debts
- A journalist for Bloomberg who has limited income or limited trading capital and may have difficulty collaborating with the right funds
- An analyst at an investment bank more focused on career highlights and growth than immediate profits
- A government employee at the Central Bank or Treasury that is otherwise powerless to end a nonsensical policy, but faces extreme disincentives (legal, continued employment, any other income stream) to disclose information

With the advent of the Pareto Network, these people can disclose information through the Network regardless of resource limitations. Users of Pareto tokens would receive the details of the information at a time delay proportionate to their ranking on the Pareto Network leaderboard, and take short positions.

In the Bank of England use case, the market efficiency would have come from predicting that there would be limited buying pressure at this point in time, because the disclosure would show exactly how big the buying pressure was: £27 billion pounds. As the bearish positions increased, the people that went short first would have profited the most. With the real-time information provided by the contributors mentioned above, the PXT users would have been able to act quickly, well before anybody outside of the Pareto Network would have known what information was being acted upon.

Pareto token users can spend a fixed amount of their Pareto tokens on a payment/reward to the contributor of the information, and this action increases the Pareto token user's ranking on the leaderboard, according to the ranking algorithm. The contributor of the information is now compensated by everyone in the Pareto Network that has an interest in moving up the Pareto Network ranking, and the contributor can sell the received Pareto tokens on the secondary markets.

SECONDARY MARKETS.

The utility of the Pareto token is that it is the only way to access information disclosed on the Pareto Network. The Pareto Network ranking algorithm is heavily weighted to owning and spending Pareto tokens to pay Content Contributors, which promotes scarcity of Pareto tokens. There are functions that promote the liquidity of a secondary market, providing ease of acquiring Pareto tokens to access and obtain an optimal ranking in the Pareto Network and confidence that the market supports the price it was acquired at.

The price of Pareto tokens will reach equilibrium at a level reflecting the perceived value of information available in the Pareto Network. Any balance of Pareto tokens above that equilibrium will be sunk capital, as it has a value which could be allocated in other valuable or potentially profitable opportunities. Users who have reached the equilibrium will therefore sell off some of their Pareto tokens on the secondary markets. Users reach the equilibrium by making profits with their external trading capital, based on the information they receive in the Pareto Network.

Another venue of liquidity will come from the Pareto token payments that Content Contributors receive for disclosing information. In order to realize usable payment for their contributions, these analysts and perceptive individuals can be expected often to sell off their Pareto tokens to people that want the Pareto tokens in order to pay for further content and to replenish Pareto tokens that they have previously spent (and thus elevate their ranking on the leaderboard).

With a limited number of PXT being created, the need for users to acquire information from contributors will result in current and new users purchasing tokens through secondary markets.

Competition amongst the rankings will promote buying of more Pareto directly from the secondary markets, as well as paying Content Contributors.

TOKEN ARCHITECTURE.

The amount of Pareto tokens is finite and a total of 500,000,000 Pareto Tokens (PXT) will be created.

The Pareto token is an Ethereum ERC20 compatible token that operates on the Ethereum blockchain[4]. Therefore, the underlying consensus mechanism supporting transactions in Pareto tokens is Proof of Work (POW) until such time as the Ethereum blockchain migrates to a Proof of Stake (POS) consensus mechanism.

Currently, the average block time on the Ethereum blockchain is well under one minute. Transactions in Pareto tokens are of a nature such that this block time (and the resultant expected time for transaction confirmation) is considered to be well within desired time intervals. Examples of common transactions are a transfer of Pareto token rewards to a Content Contributor and the spending of Pareto tokens by a user with the intent to reward a valued Content Contributor and effect an improvement in the user's ranking.

To deter spam in the kinds of information that is published, Content Contributors must hold a predetermined amount of Pareto tokens in order to be eligible to post content on the Pareto Network. In addition, there is a cost for publishing.

To address the possibility that the minimum holding of Pareto tokens is too high for a new Content Contributor, users can lease their Pareto tokens for the benefit of the Content Contributor. This enables the new Content Contributor to participate by sharing some portion of their earnings in Pareto tokens with the sponsor.

[4] ERC20 Token Standard - https://theethereum.wiki/w/index.php/ERC20_Token_Standard

CONCLUSION.

The Pareto Network is creating a new Ecosystem that will improve efficiencies in the generation and distribution of information of value to investors.

The Ecosystem will provide incentives and a mechanism for a wide range of individuals and organizations to create and share this information and subsequently receive compensation for their effort. It will broaden the range of available information and provide a market-based mechanism for investors to obtain access to information of value.

This Ecosystem will contribute to the rationalization of the market for blockchain-based investments and facilitate the more efficient allocation of capital within this revolutionary and rapidly growing sector of the global economy. In a more everyday, human context, it will allow those devoting their time and talents in this arena to benefit from Vilfredo Pareto's insight that a

fraction of the inputs account for the majority of the results.

APPENDIX A: TOKEN SALE DETAILS

Token Symbol:	PXT
Token Type:	ERC20
Total Number of PXT created	500,000,000
Percent of PXT sold in sales	33%

PRESALE

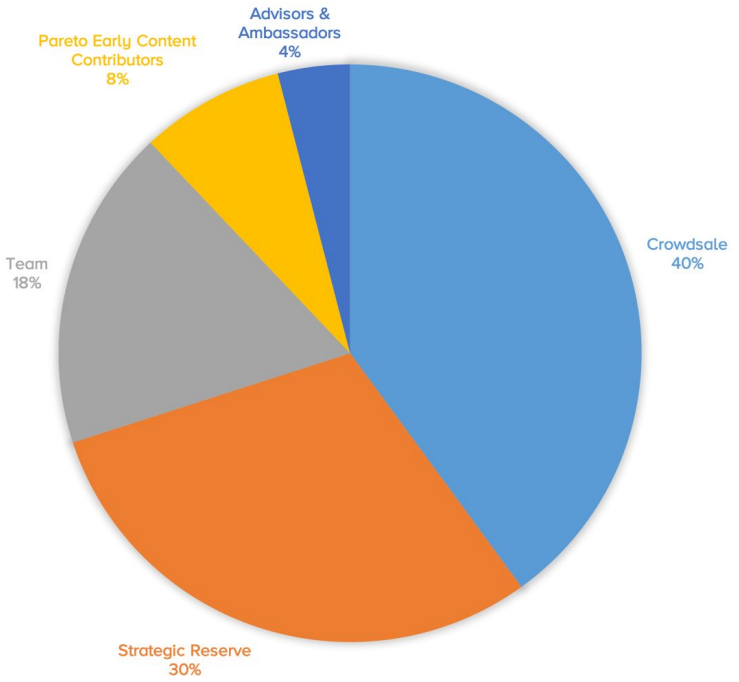
Presale Opens:	October 30, 2017
Presale Closes:	November 30,2017
Minimum Contribution in Presale:	5 ETH
Price during Presale:	$.18 per PXT[5]
Discount price for purchases over $50,000:	$.15 per PXT[6]

CROWDSALE

Token Sale Opens:	December 1, 2017
Token Sale Ends:	December 31st 2017 (or when hard cap is reached)
Token Sale Price:	$.25 per PXT
Hard Cap:	$32,000,000 (including Presale stage)

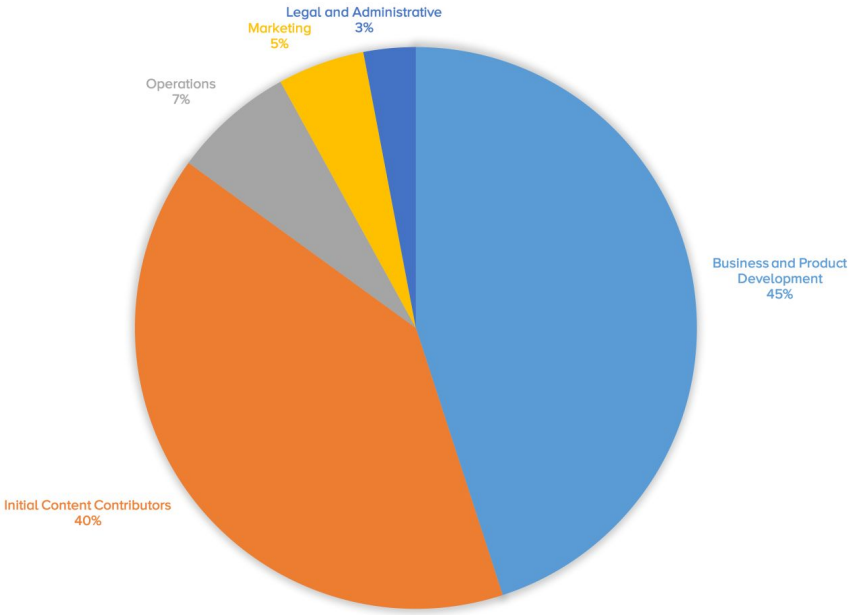
[5] Exchange rate for purchases in ETH released several hours before presale opens.
[6] Lock-up: 25% immediately available upon token distribution, 25% released after 90 days, the remaining 50% released after 180 days.

Token Distribution



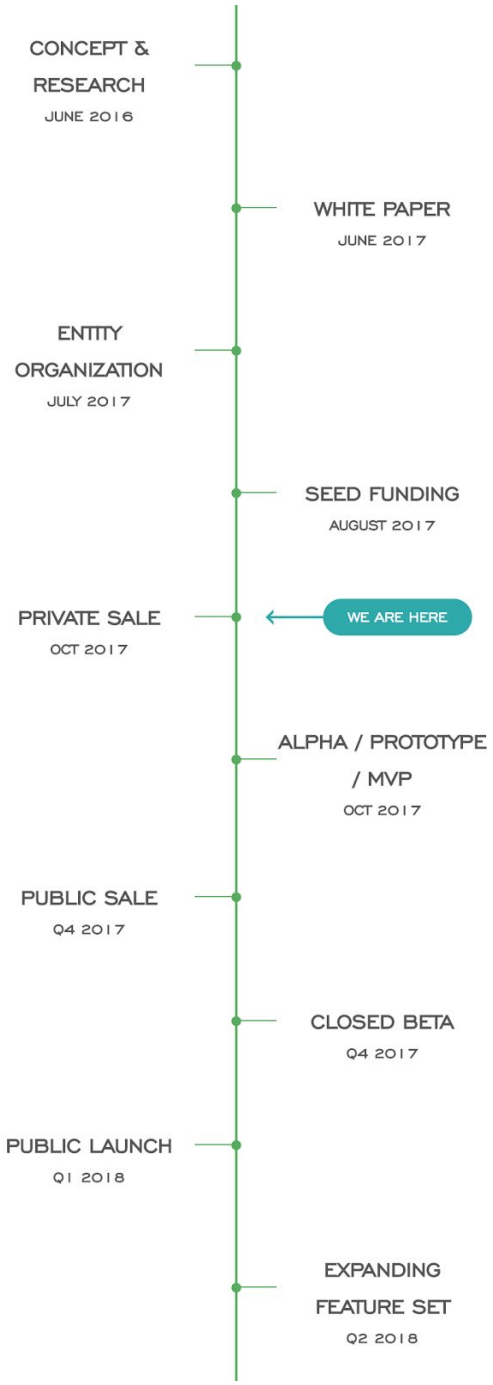
- Crowdsale
- Strategic Reserve (future partnerships, growth)
- Team
- Pareto Early Content Contributors
- Advisors & Ambassadors

Use of Proceeds



- Business & Product Development
- Initial Content Contributors
- Operations
- Marketing
- Legal & Administrative

APPENDIX B: ROADMAP



www.pareto.network