



# CRYPTOINDEX

## Cryptoindex White Paper

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**Note:** The authors of this White Paper declare that the information contained within, to the best of their knowledge, is in accordance with the facts and that the White Paper makes no omission likely to affect its import. (Ref MFSA 4 (1)(2))

## **IMPORTANT LEGAL INFORMATION**

The following White Paper refers to an offering of cryptographic tokens (“Token Sale”), which will not be available to residents (and to other persons under the jurisdiction) of the following countries:

**Afghanistan, Bosnia and Herzegovina, People’s Republic of China, Guyana, Iran, Iraq, Japan, Lao PDR, Myanmar, North Korea, Syria, Uganda, United States, Vanuatu, and Yemen.**

THE DISTRIBUTION OF THIS DOCUMENT AND THE OFFERING AND SALE OF CIX100 TOKENS MAY BE RESTRICTED BY LAW IN CERTAIN OTHER JURISDICTIONS, AND THEREFORE ANY PERSON INTO WHOSE POSSESSION THIS DOCUMENT COMES SHOULD INFORM THEMSELVES ABOUT AND OBSERVE ANY SUCH RESTRICTIONS. ANY FAILURE TO COMPLY WITH THESE RESTRICTIONS COULD RESULT IN A VIOLATION OF THE LAWS OF SUCH JURISDICTION.

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### **RISK DISCLOSURE:**

PURCHASE AND HOLDING OF CIX100 TOKENS MAY INVOLVE A HIGH DEGREE OF RISK.  
PLEASE CAREFULLY READ THE “RISK FACTORS” SECTION BEGINNING ON PAGE 113 OF THIS DOCUMENT

## IMPORTANT LEGAL INFORMATION

**The purpose of this White Paper** is to present **Cryptoindex Limited**, a private limited company created and existing under the laws of the Republic of Malta, company number: C87268, address: 171, Old Bakery Street, Valletta VLT 1455, Malta (“Company”, “Cryptoindex”, “we” or “us”) and its proposed products and services, including its CIX100 token (“CIX100 Token” or “CIX100”), to you (“you” or “Participant”), as a potential token purchaser (“Purchaser”) and/or holder (“Holder”), in connection with the proposed sale of CIX100 Tokens (“Token Sale”).

**The information set forth below may not be exhaustive** and does not imply any elements of a contractual relationship. Its sole purpose is to provide relevant and reasonable information to you as potential token holders in order for them to determine whether to undertake a thorough analysis of the company with the intent of purchasing, holding and using the CIX100 Token.

**Nothing in this White Paper shall be deemed to constitute a prospectus of any sort or a solicitation for investment**, nor does it in any way pertain to an offering or a solicitation of an offer to buy any securities in any jurisdiction. This document is not composed in accordance with, and is not subject to, any laws or regulations of any jurisdiction that are designed to protect investors.

**CIX100 Token is a ‘service’ token.** The main purpose of the CIX100 Token is to serve as a means of payment for the acquisition of products and/or services from the Company. This product is not a security, commodity, or any other kind of electronic money or financial instrument and neither it, nor this White Paper has been registered under the United States Securities Act, the securities laws of any state of the United States of America, or the securities laws of any other country, including the securities laws of any jurisdiction in which a potential Token holder is a resident or to which it may be subject. A CIX100 Token is not intended for sale or use in any such jurisdiction, or generally in any jurisdiction where sale or use of digital tokens may be restricted or prohibited.

**A CIX100 Token confers no other rights in any form**, including but not limited to any ownership, distribution (including but not limited to profit), redemption, liquidation, proprietary (including all forms of intellectual property), or other financial or legal rights, other than those specifically described in the White Paper.

**CIX100 Token is a ‘service’ token not intended to be used for any purposes other than those provided in the White Paper**, including but not limited to, any investment with a view to return, or any other speculative purposes.

**There is presently no market for the CIX100 Tokens** and it is possible that such market may not arise, or be liquid enough, in the future, due to various circumstances, including, among other, limited transferability of certain rights conferred by the CIX100 Token. Accordingly, there may be circumstances in which you may be unable to dispose of your CIX100 Token, or exercise or dispose of certain rights conferred by it.

Certain statements, estimates and financial information contained in this White Paper constitute ‘forward-looking statements’ or information that refer to anticipated future results, including estimated synergies, or other non-historical facts. These are forward-looking statements that reflect the Company or its managements’ current perspective of existing trends and information as of the date of this White Paper. Forward-looking statements generally will be accompanied by words such as “anticipate,” “believe,” “plan,” “could,” “should,” “estimate,” “expect,” “forecast,” “outlook,” “guidance,” “intend,” “may,” “might,” “will,” “would”, “possible,” “potential,” “predict,” “project,” or other similar words, phrases or expressions. It is important to note that these goals and expectations are not predictions of actual performance. Actual results may differ materially from current expectations depending upon a number of factors affecting our business and associated with it. These factors include, among others, the inherent uncertainty associated with business plans and financial projections; the anticipated size of the markets and continued demand for our products and services; the impact of competitive products and pricing; access to available financing on a timely basis and on reasonable terms; the risks of fluctuations in traditional and crypto financial markets; the risks and uncertainties normally incident to the cryptocurrency industry, including competition in such industry; product liability claims; the difficulty of predicting the timing or outcome of pending or future litigation or government investigations; variability of consumer behavior and sentiment; the timing and success of product launches; the difficulty of predicting the timing or outcome of product development efforts and regulatory agency approvals or actions, if any; potential for adverse pricing movement; costs and efforts to defend or enforce intellectual property rights; difficulties or delays in manufacturing; reduction or interruption in supply; product quality problems; the availability and pricing of third-party sourced products and materials; risks associated with self-insurance and commercial insurance; successful compliance with governmental regulations applicable to our products and/or businesses; changes in the laws and regulations; risks associated with international operations; changes in tax laws or interpretations that could increase our tax liabilities; the loss of key senior management or scientific staff; and other risks. Such forward-looking statements or information involve known and unknown risks and uncertainties, which may cause actual events or results to differ materially from the estimates or the results implied or expressed in such forward-looking statements.

**This White Paper can be modified after its original publication date to provide more detailed information.** The Authorised Fund referred to in this White Paper is a proposed entity that is currently being set up and is not fully operational as of the initial publication date of this White Paper. The set-up and operation of the Authorised Fund is also subject to regulatory approval. See [cix.fund](https://cix.fund) for more detail.

This English language White Paper is the primary official source of information about us, our products and services, and about the CIX100 Token. The information contained herein may from time to time be translated into other languages or used in the course of written or verbal communications with existing and prospective customers, partners, etc. In the course of such translation or communication some of the information contained herein may be lost, corrupted, or misrepresented. The accuracy of such alternative communications cannot be guaranteed. In the event of any conflicts or inconsistencies by using such translations and communications and this official English language White Paper, the provisions of this English language original document shall prevail.

### **VIRTUAL FINANCIAL ASSETS ACT DISCLOSURE**

AT TIME OF INITIAL PUBLICATION, THIS WHITE PAPER DOES NOT MEET, AND IS NOT LEGALLY REQUIRED TO MEET, THE STANDARDS OF DISCLOSURE ESTABLISHED UNDER FIRST SCHEDULE OF THE MALTESE VIRTUAL FINANCIAL ASSETS ACT, 2018 (MATTERS TO BE SPECIFIED IN A WHITEPAPER OF AN ISSUER AND REQUIREMENTS FOR ITS APPROVAL AND PUBLICATION).

THIS WHITE PAPER WILL BE SUBJECT TO FURTHER UPDATES AS MAY BE REQUIRED UNDER APPLICABLE LAW, INCLUDING A DISCUSSION OF MATTERS LISTED IN FIRST SCHEDULE OF THE MALTESE VIRTUAL FINANCIAL ASSETS ACT, 2018.

### **NOTICE FROM OUR COUNSEL**

GANADO Advocates, of 171, Old Bakery Street, Valletta VLT1455, Malta, acts as Maltese legal counsel to Cryptoindex. In doing so, GANADO Advocates have not researched or verified the accuracy or completeness of any information included in the Token Sale documentation. Furthermore, no separate counsel has been engaged to independently represent the Purchasers or Holders in connection with these matters. It is the responsibility of any recipient of this White Paper to obtain such legal and/or regulatory advice, as may be required.

# Table of Contents

▶ <b>Introduction</b>	<b>8</b>
Crypto 2018: a World of Peril and Opportunity	8
The Known Benefits of Classic Indices	11
Why the World Needs a Cryptocurrency Index	13
A Cryptocurrency Index as a Game Changer	10
Broad Appeal of the Index Idea	15
Introducing Cryptoindex 100 - the Index of 100 Best Coins	17
The platform	19
CIX100	20
Proposed Acquisition Program*	21
<hr/>	
▶ <b>Token Sale</b>	<b>22</b>
Deal Summary	22
Purchaser Benefits	25
<hr/>	
▶ <b>Product Proposal</b>	<b>27</b>
CIX100 Token	27
Cryptoindex 100	28
Index Reference Value	30
Platform Services	31
<hr/>	
▶ <b>Our Team</b>	<b>33</b>
Introduction	33
Core Team Members	34
Advisory Team	35
Team Story Highlights - To Date	39

▶ <b>Zorax</b>	<b>40</b>
A brief description of Cryptoindex system and Zorax algorithm	40
What is Zorax?	43
How Zorax Works	48
Index Management	82
<hr/>	
▶ <b>Appendix 1 - the Token Sale</b>	<b>101</b>
Token Description	101
Token Sale Registration	101
Principal Features of the Tokens	101
Summary of Token Sale Terms	103
Sale of Tokens	105
Price and Payment	105
Bonus Token Allocation	107
Overdrive Option	107
Token Distribution	108
Terms of Refund	109
<hr/>	
▶ <b>Appendix 2 - Authorised Fund</b>	111
▶ <b>Appendix 3 - Security Safeguards Against Cyber Attack</b>	114
▶ <b>Appendix 4 - Executive Team Details</b>	115
▶ <b>Appendix 5 - Risks</b>	116
▶ <b>Appendix 6 - Legal Opinion</b>	130
▶ <b>Annex 1 - Zorax Factor Library</b>	133



## Crypto 2018: a World of Peril and Opportunity

**Cryptocurrencies now hold a market cap of more than \$200 billion.**<sup>1</sup> According to analysts, in the coming years, the capitalization of the cryptocurrency market may reach 10 trillion dollars.<sup>2</sup> More crypto millionaires, who will have earned their wealth through fortunate investing in tokens and coins, will appear as the market grows.

**With the rapid growth of cryptocurrencies, an increasing number of professional and amateur investors around the globe are being attracted by the potential returns.** There are more than 26 million users<sup>3</sup> of blockchain wallets in the world, and over the past year, this number increased by 12 million. Such increasing tempo suggests growing popularity, but it also signals challenges to the cryptocurrency market structure.

**The market has now grown to thousands of coins.** Today, there are almost 2000 distinct cryptocurrencies on the market,<sup>4</sup> a number that will continue to grow daily. With this rapid growth, there are concerns that some of the new coins are secure and some are not. In this environment, picking the right coins to store crypto funds is becoming a highly complex task.

For many crypto investors, the typical strategy used to be - buy Bitcoin and simply hold it. As Bitcoin's opportunities for multiple growth in the future now seem limited, other options must be assessed. **Those who want to be more active in generating profits need to browse through hundreds of altcoins, hoping to find the next Bitcoin or Ethereum.**



## But which coin will it be?

To fully grasp everything that is happening in the crypto market these days, a novice investor needs to analyze an enormous number of data sources and continuously examine new coins, in other words, he or she must be fully immersed in the process on a professional level.

The constant fluctuation of popular coins adds to concerns, and even Bitcoin is a market champion in volatility. Over the past year, there have been several price rallies for the world's most popular cryptocurrency. It went up to around \$20k, then fell below \$7k, then jumped to \$11k and has fluctuated around \$6.5k in Q2 2018. Such price moves can, naturally, result in great losses. Not all potential crypto investors can stand a loss in their portfolio of 20% to 80% over a short period of time. This is another reason why many potential cryptocurrency users, while prepared to tolerate moderate and calculated risks, are still hesitant to enter this volatile market.

The cryptosphere, nevertheless, remains famous for the opportunities it offers to investors and businesses. Last year, ICOs and altcoins provided a return on investment of up to 500%<sup>5</sup> with the equivalent potential for losses. According to recent statistics,<sup>6</sup> there were 902 token sales in 2017 which raised a total of more than \$2 billion.

<sup>1</sup> <https://coinmarketcap.com/>

<sup>2</sup> According to RBC Capital Markets analysts Mitch Steves and Amit Daryanani (<https://finance.yahoo.com/news/rbc-cryptocurrency-market-one-day-worth-10-trillion-172113529.html>)

<sup>3</sup> <https://blockchain.info/>

<sup>4</sup> <https://coinmarketcap.com/>

<sup>5</sup> <https://hackernoon.com/utility-tokens-vs-security-tokens-what-the-future-of-icos-will-look-like-faa9017e8aa8>



Unfortunately, 142 projects did not survive, and 46% of last year's ICOs were dead by early 2018. As already mentioned, there have been billions in losses due to the high volatility of cryptocurrencies.

**Security risks are not making the market any more attractive for newcomers.** There are multiple stories about people losing access to their assets for a variety of reasons, from forgetting the PIN<sup>7</sup> to accidentally throwing out<sup>8</sup> a hard drive holding thousands of Bitcoins. There are also plenty of situations where crypto traders are losing their money due to their exchanges being hacked.<sup>9</sup> Information security risks are another important factor for players to be aware of.



# The Known Benefits of Classic Indices

**The stock market has seen similar highs and lows throughout its history, as it initially went through similar problems in its early development phase.**

Creation of stock indices was one major milestone in the history and development of global finance and business.

**A stock index is a measurement of a section of the stock market,<sup>10</sup> calculated from the prices of selected stocks (typically a weighted average).** It is a tool used to describe and rationalize the market and to compare the return on specific sectors or types of business. The primary criterion of a stock index is that the method of its construction should be clear.

**The first stock index - The Dow Jones Industrial Average - was unveiled by the finance journalist Charles Dow in 1896.** This index was an average of the top 12 stocks in the market; the majority of the companies were in the industrial sector. The DJIA (Dow Jones Industrial Average) was calculated simply by taking all of the stock prices, adding them together and then dividing them by the number of stocks. The number<sup>11</sup> that came out of this equation on May 26, 1896, was 40.94. Since then the range of Dow Jones products has greatly expanded, and the initial Dow is now trading above 25,000, at an all-time high.

When people speak of the stock market today, they often refer to the Dow, S&P 500, or the NASDAQ.

Each of these indices represents a unique segment of



the overall market and tracks the performance of a basket of securities. These indices, for decades, have shown their effectiveness despite wars and crises; allowing non-professional investors to invest into an index, thereby diversifying their shareholding without any time constraints for analysis of individual companies.

**The impact of indices on investing was, and continues to be, significant.** First, indices brought transparency and a better understanding of market forces, by giving a measure of overall market sentiment. Indices created a benchmark for investors to measure up against. The creation of indices encouraged a segment of the investing population to choose a less active role, thus creating, for the first time in investing history, a possibility for people with little financial knowledge to control their own portfolios. This, in turn, created opportunities to outperform a single product investment.

In the words of Warren Buffett: "By periodically investing in an index fund... the know-nothing investor can actually outperform most investment professionals."

6 <https://news.bitcoin.com/46-last-years-icos-failed-already/>

7 <https://www.wired.com/story/i-forgot-my-pin-an-epic-tale-of-losing-dollar30000-in-bitcoin/>

8 <http://www.newsweek.com/man-accidentally-threw-bitcoin-worth-108m-trash-says-theres-no-point-crying-726807>

9 <https://finance.yahoo.com/news/coincheck-cryptocurrency-hack-everything-know-111140809.html>

<https://finance.yahoo.com/news/bitcoin-hack-bitfinex-cold-storage-bitgo-cftc-225434534.html>

<https://uk.finance.yahoo.com/news/digital-currency-ethereum-cratering-amid-093418142.html>

10 [https://en.wikipedia.org/wiki/Stock\\_market](https://en.wikipedia.org/wiki/Stock_market)

11 <https://www.investopedia.com/terms/d/djia.asp>



## Why the World Needs a Cryptocurrency Index

It is becoming obvious that the cryptocurrency market needs a tool that can help reduce investment risks and make crypto trading a more secure and viable option. A cryptocurrency index, similar to an Equity, Fixed Income or Commodity index, can be considered a solution for the current crypto market challenges.

The formation of a cryptocurrency index is, therefore, the logical next step in allowing the old-world financial markets to start looking at the new world currencies as a serious and viable investment opportunity. A well-thought-out index, taking into account the regulatory and compliance needs of the sophisticated investor, would change the game. Contracts created and listed based on a cryptocurrency index provide a simple, well understood and tested method for the financial community to take an active interest in cryptocurrencies as a whole.



**A cryptocurrency index organizes a certain number of digital currencies into a single diversified portfolio, creating an effortless, cost effective and efficient tool that is easy to understand.**

A cryptocurrency index, with a token based on it, could enable the holders to diversify their exposure to the cryptocurrency markets via a single token, without the need to expend significant amounts of time or resources researching individual coins.

**With a cryptocurrency index, a customer has the opportunity to monitor the dynamics of the cryptocurrency markets and store savings in several digital currencies,** conducting a minimum of transactions. Such a tool, combining the best characteristics of multiple coins, could reduce the volatility and risks found in most single cryptocurrencies.

## **A Cryptocurrency Index as a Game Changer**

A cryptocurrency index that goes to the heart of the exciting and vibrant universe of cryptocurrencies, while offering a methodology fully suited to the needs and requirements of heavily regulated asset managers, institutional and professional investors. It is a potential game changer. By attracting a massive investor base, it could create an even playing field, with resounding implications for the nature and infrastructure of the crypto market.

If a price of such cryptocurrency index was ensured with the value of coins included into it, this would allow such an index token to become a fully - fledged market coin.



# Broad Appeal of the Index Idea

A cryptocurrency index would be appealing to a wide range of participants, including:

## Crypto Newbies

A cryptocurrency index would be an ideal starting point for people who have long desired to explore the crypto market easily and economically but did not know where or how to start. This index solves nearly all the typical problems for a newcomer. They no longer need to analyze a large number of data sources to choose coins with the best opportunities for a return.

## Experienced Cryptocurrency Users

For crypto enthusiasts with prior exposure to Bitcoin or Ethereum, a cryptocurrency index can be a perfect tool for veering off the beaten track, while building a diverse portfolio. The proportion of currencies, the time to open the position, getting the lowest commissions, rebalancing - all these challenges are managed and packaged into a simple-to-use tool, which represents the cryptocurrency market as a whole. As indices historically tend to outperform the market, it enables investors to realize the profit potential an index offers.

## Crypto Traders

When an index-linked product is listed on an exchange and becomes available for active trading, there will be demand for market makers to provide the liquidity.



Once market makers are in place, the value of the index tool is increased dramatically, as an exit opportunity usually positively impacts the price of any asset. For crypto day traders, a cryptocurrency index which represents a majority of the value of the market could become an extremely convenient tool for speculative transactions, regardless of the strategy being used. A highly sophisticated instrument, such as an index of the top market currencies, could be used as a tool for various trading strategies, such as high-frequency, algo and correlation trading, etc.

## Crypto Funds

By purchasing an index token, Crypto funds would get access to a ready-made portfolio analysis with an existing track record, while decreasing volatility and therefore risk to their fund capital. There is no necessity for the fund to use valuable resources and time to manually compose such a portfolio.

## Traditional Financial Institutions

As traditional regulated financial services institutions consider an entry point into the crypto market, availability of tools for them to track, analyze, and perform due diligence on the market is essential when bringing them onboard. A professional index, similar to indices that are used in existing markets, will act as a vital step in their entry into cryptocurrency markets. Futures or equivalent contract based on that index will speed up their adoption all the more.



# Introducing Cryptoindex 100 - the Index of 100 Best Coins

We proudly present the Cryptoindex 100 - an AI- (short for Artificial Intelligence)- driven analytical snapshot of the world's 100 best-performing cryptographic currencies.

## Basic Concept

**Cryptoindex 100 is a digital expression of the top 100 coins, that recalculates itself continuously as the cryptocurrency market ebbs and flows.** The index represents a mathematically computed value of the coins, included in the structure of the index, changing every second along with each movement of the price of each index coin. Integration with the 9 largest exchanges allows continuous tracking of tens of millions of trades and orders per day, which are then instantly reflected in the price of the Cryptoindex 100.

## Index Composition

The index functions according to our proprietary algorithm, 'Zorax.' Over 1,800 coins are put through our fixed set of filters, which provides around 500 coins as a rough output. Data is collected from cryptocurrency exchanges, news, social media, such as Twitter, GitHub, and other sources. The collated data is used to extract over 200 factors that create a refined ranking in the index. Then, the factors are fed into the neural network, creating a final rating of coins, with the top 100 coins making up **the Cryptoindex 100**. Zorax was trained on the entire crypto trade history, including the early start of the cryptocurrency market. Tens of billions of action data points from cryptocurrency market participants were downloaded into our set of neural networks. Zorax learns from tens of millions of new trades and orders every day, analyzing tens of millions of



messages, news announcements and events in the cryptocurrency market - making a unique self-learning, highly sophisticated decision-making machine. **Previously created indices are based upon the logic of Coinmarket cap in their structure.** Unfortunately, the current cryptocurrency market situation has led to artificially “pumped” coins being included in indices. Due to the Cryptoindex methodology, the structure of Cryptoindex 100 differs by 20%-50% from the mathematical distribution of coins based on the market capitalization and volume trades. Zorax neural network filters out speculative transactions and “over-hyped” coins and instead analyzes sentimental data to determine the most promising coins. Compared with the simple mathematical distribution of top 100 coins, based on the coins' capitalization and volume trades, Cryptoindex’s approach showed up to 2 times higher levels of efficiency in the last 1.5 years. **The opportunity for emotion or human error to directly influence strategy is reduced to near zero as the index is AI-managed.** Cryptoindex’s powerful algorithms automatically select the top 100 crypto coins, using multiple factors to rebalance its structure on a continuous monthly basis.

## Index Rebalancing

**Rebalancing of the Cryptoindex 100 happens monthly, when the composition of the index is changed by up to 22% on average. By analyzing thousands of trades and signals every second, based on more than 200 factors, Zorax rebalances the weight of the coins in the index, including new, promising coins and excluding those showing diminishing returns.** The Cryptoindex 100 has been in live testing since October 2017. Zorax’s ability to learn quickly has been demonstrated by its ability to successfully select coins for every testing period, beating Bitcoin and out-performing the total market capitalization. The current index value and its composition with detailed analytics for each coin included in the index are available at the Cryptoindex Platform.



# The Platform

The **Cryptoindex platform (“Platform”)** was conceived as a **one-stop crypto market resource, aiming to provide novice and experienced users with the full scope of valuable, up-to-date information and analytics.** With readily accessible top crypto market news, price quotes, real-time trading, and order book information, the Platform allows users to monitor the crypto markets efficiently. The Platform provides top-of-the-line analytics on all coins included in the Cryptoindex 100.

**To choose the 100 most promising coins and to form the Cryptoindex 100 algorithm, Zorax analyses a huge amount of data sourced from tens of billions of actions of cryptocurrency market participants.** The Platform highlights this decision-making process, by showing the impact of different factors on the weight of each coin in the index, displaying recently added coins, giving predictions of the neural network about each coin in the index for the next period. Cryptoindex is sharing its own ratings of the most promising and most underperforming coins along with full analytics for each coin.

The full suite of Platform services would make the Platform a ‘Bloomberg’ of the crypto world. These services will include:

- **Real-time Data** from Multiple Exchanges
- **Access to online Data Streaming Services** via API
- **Historical Data** and Statistical Datasets
- **Predictions, Analytics**
- **Market Overview & Forecasts**
- **Current Index Structure** and Recently Added Tokens
- **Cryptocurrency Rating System & Reports**



# CIX100

An aspiring crypto participant in the dynamic cryptocurrency market needs more than an informational tool to address the twin challenges of cost and complexity. Cryptoindex aims to overcome these obstacles by providing its own token (the CIX100) based on the Cryptoindex 100.

- ▶ **CIX100 is a market coin launched by the Cryptoindex team that represents an index of the top 100 performing cryptocurrency coins, referred to as the Cryptoindex 100.** The “reference value” of CIX100 is based on the mathematical value of the coins in Cryptoindex 100. Through integration with the 9 largest cryptocurrency exchanges, we are able to track millions of trades in these coins, and through our neural network algorithms, the summarized price action is then reflected, in real time, in the value of the Cryptoindex 100.
- ▶ **All the Token Holders will get 50% discount** on the value of the Services offered on the Platform when paying with CIX100 Tokens.
- ▶ **The CIX100 token is an ERC20 standard token, which means it can be stored in any wallet or on any exchange that supports the standard.** There is a limited number of tokens to be issued, set at 300,000,000.
- ▶ **In the initial Token Sale stages, 60,000,000 CIX100 tokens will be available at a price of 0.0001 BTC for 1 CIX100.** All Token Sale Purchasers will get 3 months free PRO access to the Cryptoindex 100 Platform.



## Proposed Acquisition Program\*

Following the Token Sale, it is expected all initial Token Sale Purchasers will be given an opportunity to offer their CIX100 Tokens to an Authorised investment fund at a price that would be determined by reference to the then current CIX100 index value.

**Appendix 2 (“Authorised Fund”) beginning on page 111 describes the proposed acquisition program in more detail. See also [cix.fund](http://cix.fund).**

\*The Authorised Fund referred to in this White Paper is a proposed entity that is currently being set up and is not yet fully operational as of the initial publication date of this White Paper. The opportunity to approach the Authorised Fund will be conditional on the fund’s registration, terms and conditions, and position limits. The Authorised Fund will purchase CIX100 Tokens at its own discretion; no purchase will be guaranteed.

# Token sale



## Deal Summary

### Token Issuer

**Cryptoindex Limited, Malta**  
171, Old Bakery Street, Valletta VLT1455,  
Republic of Malta  
(company number C87268)

Start Date	17 October 2018, 10:00 (UTC+1)
End Date	10 March 2019, 23:59 (UTC+0) (or earlier, if Hard Cap is reached)
Token Delivery Date	10 April 2019, 23:59 (UTC+0) (or earlier, if Company so announces). See 'Bonus Tokens' below
Price of CIX100 Token	0.0001 BTC
Minimal Purchase Amount	0.01 BTC
Hard Cap	U.S. \$37 000 000 (thirty seven million)
Soft Cap	U.S. \$3 000 000 (three million)
Overdrive Option	Yes - 20% over the Hard Cap <b>See Appendix 1, "Overdrive Option"</b> below for details
Bonus Tokens	Yes - <b>see Appendix 1, "Bonus Token Allocation"</b> below for details



Coins Accepted	Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), Bitcoin Cash (BCH), Steem (STEEM)
Technical Limit to the Number of Tokens	300 000 000 (three hundred million)
Further Token Issues	No - all Tokens will be issued by the Token Sale
Further Token Sales	Tokens not sold during Token Sale will be held by Company at the reserve fund and may be sold by Company within a year after End Date of the Token Sale (subject to applicable legal requirements)
Adjustable Distribution	Tokens not sold/allocated within 365 calendar days from end of Token Sale will be destroyed
Symbol	CIX100
Standard	ERC20
Token Distribution	<p>In order to receive Tokens, a Purchaser must satisfy the following conditions within 10 calendar days from the End Date of Token Sale:</p> <ul style="list-style-type: none"><li>▪ <b>All KYC/AML procedures</b> must be satisfactorily passed by the Purchaser;</li><li>▪ <b>the Purchaser must provide a valid wallet address</b> and other information required for distribution of Tokens to such Purchaser.</li></ul>



	<p>The Purchasers that have satisfied these conditions within 10 calendar days from the End Date of Token Sale should normally receive their Tokens by Token Delivery Date. Company reserves the right to delay distribution of CIX100 for any reason whatsoever (including the collection, processing, and completion of any KYC or AML checks on Purchasers and their wallet addresses, as well as in connection with any requirements of applicable law).</p>
<p><b>Failure to Comply</b></p>	<p>If a Purchaser has satisfactorily completed all required KYC/AML checks within 10 calendar days from End Date of Token Sale, but has not yet provided a valid wallet address and other required information, the distribution of Tokens to such Purchaser may be delayed beyond the proposed Token Delivery Date.</p> <p>If a Purchaser has not satisfactorily completed all required KYC/AML checks within 10 calendar days from End Date of Token Sale, or if the checks fail for any reason, we will take steps to refund the Purchaser's contribution to his/her wallet by the 20th calendar day from the End Date of Token Sale.</p>
<p><b>Lock-Up</b></p>	<p>The Tokens allocated to our advisors and team members will come with a 1-year lock-up period. Other Tokens will generally be freely transferable immediately upon receipt. See also 'Bonus Tokens' below.</p>
<p><b>Bonus Tokens</b></p>	<p>Bonus Tokens will be delivered to Purchasers in two tranches (in 3 and 6 months following the Token Delivery Date).</p>



# Purchaser Benefits

Token Sale Purchasers will get the following main benefits:



## Ability to offer your CIX100 Token -

a stand-alone regulated fund (“Authorised Fund”) will be created, set up and licensed to manage a portfolio of cryptocurrencies including, amongst others, CIX100 Tokens. (See [cix.fund](http://cix.fund) for more detail.) The Authorised Fund may in its absolute discretion buy CIX 100 Tokens from Token Sale Participants. Please see Appendix 2 beginning on page 111 for a more detailed discussion of the proposed Authorised Fund program.

## 50% Discount

when paying with CIX100 Tokens, Token Holders will enjoy a 50% discount on the price of all services offered on our Platform.



## 3 Months free access -

to the Cryptoindex platform (“**Platform**”) and to the Cryptoindex 100, a highly sophisticated AI-based analytical tool.



## Bonus Tokens –

extra Tokens may be allocated to you based on the amount and timing of your purchase of CIX100 in the Token Sale. **See Appendix 1 (“The Token Sale”)** beginning on page 101 for a detailed description of Bonus Token allocation terms.



## Get more information

### Website

Our Website will serve as the main gateway for all matters related to the initial purchase of CIX100 Tokens by you. To familiarize yourself with the Token Sale process and the requirements that may apply to you in its context, please visit our Website.

### Appendices

A detailed description of the Token Sale terms is contained in Appendix 1 (“The Token Sale”) beginning on page 101. Please review Appendix 1 for a description of the Bonus Token allocation terms, Refund Terms, and other important information.

### Policies

Please note we will use the services of various third party providers to streamline the Token Sale process (including for the purpose of conducting purchaser identity checks, token generation and distribution, and personal data storage and protection). You should familiarize yourself with all our related policies, such as our Privacy Policy and our KYC/AML Policy.

# Our Product Proposal



## CIX100 Token

**CIX100 Token is an ERC20 standard ‘service’ token** that represents an index of the top 100 cryptocurrency coins, referred to as the Cryptoindex 100.

**The Token can be used on the Cryptoindex Platform** as a means of payment for all Services offered through the Platform, including the various analytical services such as:

- current index value and structure; real-time data from multiple exchanges
- access to online data streaming services via API
- historical data and statistical datasets
- cryptocurrency market predictions&analytics
- market overview&forecasts
- other valuable informational services

**Outside of our Platform, the CIX100 Token will be freely transferable to third parties on the open market upon its receipt**, just like any other ERC20 standard token. To grow the user base and fulfill users’ expectations, Tokens may be listed (subject to all required legal approvals) on cryptocurrency exchanges. The list of the exchanges the CIX100 Token is eligible to be traded on is expected to be published after the End Date of the Token Sale. We anticipate that, following the Token Sale, applications will be lodged for CIX100 Tokens to be admitted to trading under the ticker symbol CIX100.

Once the Authorised Fund is established and becomes operational, a CIX100 Token would be eligible for offer to the Authorised Fund at a certain Index Reference Value, subject always to such Authorised Fund’s discretion, terms and conditions, and position limits. See Appendix 2, “Authorised Fund” beginning on page 101. See also [cix.fund](http://cix.fund) for more detail.



# Cryptoindex 100

Currently, the structure of the Cryptoindex 100 with a list of coins included in the index, its proportions and dynamics of changes since October 1, 2017, is presented at [cryptoindex.ai](https://cryptoindex.ai). The next major milestone in the establishment of the index will be a forming of the Index Reference Value. The process of its formation is described in detail in the “Index Reference Value” section beginning on page 30 below.

**Cryptoindex 100 is an index of the 100 best performing cryptocurrency coins created with the help of Zorax, our proprietary AI network.** Based on more than 200 factors, Zorax continuously rebalances the top performing coins in the index, ensuring promising coins are included and inefficient ones are excluded. By pinpointing the most promising and consistently well-performing coins, the index will allow you to balance the risk, by offering a robust structure including only the high-potential coins.

See “Zorax” beginning on page 40 below for a detailed description of the mathematics behind the Cryptoindex 100 index.



## **Main advantages of Cryptoindex 100 compared with 'Do-it-Yourself' Cryptocurrency Portfolio**

### **1. Analyzing data**

It is virtually impossible to be fully informed about all the cryptocurrencies, especially when their numbers are growing daily. Just collecting and analyzing all the valuable sources will take at least 8 hours daily, comparable with a full-time job. Cryptoindex 100 can do it all on its own by collecting and processing more than 100Gb of data daily.

### **2. Exchanges to be registered on**

Signing up at 8 exchanges is required to track price action of the 100 coins. With Cryptoindex, all market data is provided on Platform, so registration at cryptocurrency exchanges is not required.

### **3. Assess price action of the top 100 coins**

Assessing the price action of the top 100 cryptocurrencies will take up to 48 hours when you manage it manually. Cryptoindex 100 needs 1 minute only to complete the process.

### **4. Rebalance**

Cryptoindex rebalances the structure of the index automatically, while regular decision-making about each coin of the top 100 is very complex for any crypto holder, even if a sophisticated software is used to simplify the process.

### **5. Human factor**

Every human being has a chance to make mistakes in the decision-making process. In Cryptoindex human factor element strives to be zero. Imagine the opportunities of an index that is driven by AI.



# Index Reference Value

No later than the Token Delivery Date, we will assign an initial Index Reference Value to the Token in USD. The Index Reference Value is updated continuously and will be used on our Platform for determining a Participant's account balance available, to pay for our Services using the CIX100 Tokens.

The reference value of Cryptoindex 100 (**"Index Reference Value"**) will be calculated as follows:

## **'Index Reference Value' is the sum of the Weighted Market Values of all the Index Coins, where:**

- Index Coin is any coin included in the Cryptoindex 100 in the relevant period
- Weighted Market Value is a volume-based weighted average over the Indexed Exchanges of all Market Prices of an Index Coin reported for such Period
- Market Price of an Index Coin is equal to the Index Coin's trading price as reported on each of the Indexed Exchanges
- Indexed Exchange is any cryptocurrency exchange, data from which is integrated into the Cryptoindex 100 Network and is used to calculate the trading price for coins included in Cryptoindex 100 in the relevant period.

Once an Authorised Fund is established and becomes operational, a CIX100 Token purchased in the ICO, would also become capable of being offered by Token Sale Purchasers to the Authorised Fund at a certain Index Reference Value. See Appendix 2 ("Authorised Fund") beginning on page 101 below for more detail.



## Existing Services

The process of the index structure should be transparent, and the Platform has been created to present the current index value, its composition and detailed analytics for each individual coin. The highly sophisticated decision-making machine Zorax, trained on all possible cryptocurrency market data since the Bitcoin appearance, allows Cryptoindex to produce top-notch data and analytics. That is why in addition to this functionality paid services and tools for visualizing the data will be added. Creating one of a kind Platform that provides instant exposure to the whole crypto market!

Full scope on any coin at your fingertips:

- **News, Market & Trading info**
- **Predictions, Analytics**
- **Market Overview**
- **Recently Added Tokens**
- **Market forecast**
- **Cryptocurrency rating system & analytics report** - every coin goes through Zorax's analysis layer and is analyzed by more than 200 factors. After each coin is automatically rated and ranked; and
- **Track index structure and index quotes online**

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## Proposed Services

**Our unique informational infrastructure allows us to provide data services via an API with previously unseen flexibility.** The state of the art technology applied to our system can provide you with a wide range of market data. We plan to accept requests for API streaming on a client-by-client basis, tailoring each API to the customer's preferences. The price of these services will vary depending on the complexity of the client's requests and the amount of data required. A standardized solution is also being considered, but it is currently still in development.

**We plan to roll out enhanced data analytics:** volatility and correlation statistics, principal component analysis, charting facilities, moving averages and coin rankings. With the datasets generated by Zorax, a user would be



able to study smaller coin baskets with similar biases and customize analysis in ways not previously possible. In the future, we aim to release more services which will implement the possibility of direct coin purchases for the user and portfolio management via API.

**Dataset access** - as we collect information from tens of millions of trades and orders on a daily basis, we can supply any user with a wealth of datasets containing all applicable trade information: price, volumes, order books, trade information on every single trade executed on every crypto exchange, etc. So far this service is available by request; we plan to roll out an automated library in the future.

**We plan to add more indices to our set of products.** Such indices will be streamable through an API. We will also turn each index into branded widgets which can be integrated with information partners throughout the crypto community.

### **Quarterly Loyalty Function (“QLF”)**

The principal aim of the proposed Quarterly Loyalty Function is to reward the most active users, and users holding the largest prepayments for the services in their accounts. 20 percent of the Platform profit will be allocated to CIX100 Token holders on a quarterly basis - “Quarterly Loyalty Fund” or “QLF”. The exact amount will be determined by the number of CIX100 Tokens in a Token holder account and the activity of the user on the Platform measured in “Actions Point” or “AP”.

### **Action points (AP)**

Action points (AP) is a score of users activity at the Cryptoindex Platform and serves as the reward in the intra-platform loyalty program. Actions points could be accrued to the user's account after completion of the specific actions, such as:

- registration at the Platform;
- daily visits;
- taking part in contests;
- completion of tasks; and
- other exciting gamification activities which will be added in the process of the Platform development.

<sup>12</sup> Loyalty rewards will be allocated in CIX100 Bonus Tokens; therefore the total amount of all CIX100 Tokens in circulation will not be increased through the issue of such reward. The Loyalty program will start no earlier than the 1st of August 2019.

# Our Team



## Introduction

**Our team consists of highly qualified finance professionals,** with combined experience spanning several decades of hands-on developing, trading, and managing complex financial products. These invaluable backgrounds allowed us to master the creation of CIX100.

**By applying the wealth of our finance experience,** honed over the years, to the challenges of the vibrant, nascent cryptocurrency market, we created a revolutionary product set to dramatically change the way the industry operates.

## Team Leaders



### **Vj Angelo - Chief Executive Officer**

Co-founder of London Derivatives Exchange. Co-author of the Indices underpinning the Eurex Listed Constant Maturity Futures.

Over 30 years' experience in the financial markets. Pioneered a number of innovative financial indices, financial products, and market infrastructure in currency and fixed income markets. Recently heavily involved in the changes to market structure post the financial crisis.



### **Lawrence D'Souza- Head of Analytics**

Over 35 years' experience in trading, pricing and structuring multi-currency financial derivatives for international institutions. Recent experience includes developing highly sophisticated trading and predictive algorithms in inflation markets.

## Core Team Members



### **Gemma Clapton - Client Relations**

Experienced financial services business development professional with a proven record within the City of London. Worked extensively with domestic and international start-up ventures.



### **Sergey Shashev – CTO**

7 years experience in algorithmic trading (Forex, MICEX, NYSE, NASDAQ), launched AntTrader platform. Developed production systems ML+BIG DATAS+NLP in different areas. Developed complex trading robots for cryptocurrency exchanges.



### **Lana Ivina - Senior Mathematician**

Quantum field theory researcher at the National Research University HSE, with 3 years in mathematical curriculum creation in Shanghai, China. Experience in cryptocurrency bot development and algorithm development, Dexpa. BSc Degree in Electronic Physics, MSc Degree in Mathematics with a Major in Mathematical Physics.



### **Stephan Kamentsev - Software Architect**

14 years in research and development. Developed intelligent systems at Naumen, Smart Technologies, and SIAMS. Expert in distributed systems for data analysis, NLP, ML, Data Mining, DevOps, and Virtualization.



### **Caroline Matusso - Head of Marketing and Communications**

Specialist in B2B and B2C marketing with project management experience in Fortune 500 companies.



## Advisory Team



### **Austin Kimm - Corporate Finance Professional**

Experienced, results proven financial services CEO. Built companies with a current valuation in excess of \$500 million, such as Renaissance Insurance, Aviva, Commercial Union Workle and Crypterium.



### **Dorothy (McKinley) Delahunt - Corporate Attorney**

A Harvard graduate with solid experience in corporate and regulatory matters, tech and IT, including software licensing and cryptocurrencies. Currently Head of Legal at London Derivatives Exchange.



### **Gabriel Zanko - Blockchain Investor and Advisor MobleyourLife, Founder**

Over 12 years experience in financial services. Fintech Entrepreneur mostly in the AI space with solutions to the enterprise with his own company (AI Robo-Advisers -Wealth Management). Crypto Investment Banking - OTC deals and Funds.



### **James Davies - Managing Member at LDX**

Co-Founder London Derivatives Exchange. Author of the Indices underpinning the LDX owned and Eurex Listed Constant Maturity Futures. Long-term Financial Technology and Derivatives markets expert. Building infrastructure in one of the most promising fintech companies - Crypterium.



### **Sandy Broderick - IR advisor**

Previously CEO of DTCC DerivSERV, and New York Portfolio Clearing, where he oversaw its development and successful sale to ICE. During his 23-year trading career at Societe Generale and Bank of America, he was at the centre of several industry initiatives in clearing and market infrastructure.





### **Paddy Tan - Strategist, Asian Market Entrepreneur**

Serial tech entrepreneur, start-up consultant specializing in cryptos and blockchain, wearable tech, gadgets, IoT and mobile security with a no-nonsense approach for tech startups and ventures in Asia.



### **Paul Ribbins - Managing Director at Tullett Prebon**

Financial Services professional with 25 years experience in Fixed Income Derivatives Trading and FI ecommerce strategy at Investment Banks, and TP ICAP, wholesale financial markets intermediary, currently working on driving opportunities in the cryptocurrency arena.

## **Team Story Highlights - To Date**

### **1983-1996**

Lawrence D'Souza: Traded multi-currency derivatives for international banks and companies



### **1996**

Lawrence D'Souza: Designed and implemented option pricing models for financial institutions in Switzerland



### **2004**

Lawrence D'Souza: Developed models for inflation bonds focusing on seasonality, adjusted deviations from standard market models for various brokerage houses



### **2010**

Vj Angelo: Conceived bond index concept in response to the Greek and Italian crisis





## 2011

The launch of the algorithmic startup developed for electronic trading on the NYSE

## 2012

- Vj Angelo: Co-Founds GMEX, later rebranded LDX
- Vj Angelo: Development of the Constant Maturity Index (CMI) and Constant Maturity Future (CMF) for Interest Rate Swap market
- Formation of London Derivatives Exchange (formally known as GMEX)

## 2013

- Deutsche Boerse becomes an investor of LDX
- Invention of support signaling system — ML/Big Data/NLP

## 2014

- LDX: Team develop margins and structure of the CMI and CMF
- LDX: Technology is implemented and FCA Authorisation is granted
  - BAfin approval granted
  - Forward FX Indices conceived and work commences
    - Bond Indices requested by clients

## 2015

- A unique management system powered by a neural networks was created called "Zorax"
- Zorax was developed by our leading team of mathematicians and programmers with stock exchange backgrounds
  - Societe Generale becomes an investor of LDX
  - LDX: Testing and integration of trading platforms



- LDX: Regulatory approvals in Europe granted
  - LDX: CFTC exemption application granted
- LDX: Euro IRS CMF is beta listed on Eurex at the end of the year

## 2016

- Customised neural network models have been trained with the addition of new core features: sentiment analysis from multiple sources combined with market data analysis
  - Team designed inflation option models and developed AI predictive inflation models for international brokerage houses
  - LDX: Engagement with UK Debt Management Office for UK Bond Indices commences
    - LDX: Index pricing calculations and data analysis starts
- Inflation Index and futures concept road tested within the asset management community

## 2017

- Trading bots developed, AI algorithm Zorax put through final testing stages
- Blockchain explorers added to processes as an extra data source
  - LDX: Bond Indices completed
    - LDX: Development of Futures contract
- Targeted venues for 2019 listing of Bond indices negotiations commence

## 2018

- Continual development of the product line and launch of the Cryptoindex platform prototype
- LDX: Cryptoindex 100 and other Cryptocurrency product futures in development stage for deployment in 2019

# Roadmap



## Q1 2018

- Launch of the data collection and data processing system for cryptocurrencies
- Launch of the prototype, basic cryptocurrency screening for the index

## Q2 2018

- Neural network tested for the composition of the index

## Q3 2018

- Whitelist
- Cryptoindex platform testing (automated acquisition at crypto exchanges)

## Q4 2018 (Current phase)

- ICO start
- Creation of indices along with partners
- Further development of Cryptoindex Platform, new features to be added

## Q1 2019

- New indices to be developed
- Creation and testing of new market tools
- Zorax updates and improvement. Adding new factors to the model
- New exchanges integration

## Q2 2019

- Further Factor model development
- Further development of Cryptoindex Platform, new features to be added
- Continual development of new algorithmic indices (fiat and stable coins to be included)



## A brief description of Cryptoindex system and Zorax algorithm

At the core of our platform there are a lot of data analysis algorithms and a set of neural networks - 'Zorax', as well as a special system which interacts with the largest crypto exchanges. This is a unique system which was developed by our company. Its creation is an amalgamation of all the experience and achievements of our team over the last 10 years. This algorithm is able to analyze a large volume of information and decide on the composition of the index. In fact, our system consists of 5 blocks. A brief explanation of them is provided below:

### **1st block: the information collection system**

It is a system of robots which aggregates information from tens of billions of actions from the cryptocurrency market participants, from various different sources: Cryptocurrency exchanges, news resources, thousands of telegram chats; ending up with the information on projects' updates in GitHub. During this stage, the system collects the maximum amount of information from more than 1800 coins from tens of thousands of sources. This data is then transferred to the analysis system.

### **2nd block: the analysis system**

Using the gathered data from the first block, the information is automatically systematized and transformed into factors on the basis of which the system will decide on the composition of the coins. The volume of trades, movements in the order books, price movements, site visits, chat discussions, and other signals become normalized metrics, which are subsequently submitted to Zorax. Over 1800 coins are put through the set of filters, which provides around 500-600 of the most promising coins as a rough output.



### **3rd block: neural network**

This block is made up of the five neural networks, which, on the basis of training, accumulates newly received information and creates forecasts for the most important metrics of cryptocurrencies. From the systematized data and constant learning, the neural network module decides which coins can enter into the index. The top 100 most promising coins are chosen based on the results from Zorax, each coin receives a comprehensive rating, and the final weight of each coin in the portfolio is calculated, creating the Cryptoindex 100. The information on these 100 coins is transferred to the test purchase module.

### **4th block: test purchase module**

This module executes a test purchase and sale of each of the coins using a very small amount of funds from our special testing reserves. This procedure is needed to check if a particular coin can actually be bought and sold by a user easily and at the price quoted, and to flag up any technical problems with transacting in the coin. There is an abundance of examples where a coin was very active “on paper,” but in reality, it was impossible to buy or sell, due to trading interruptions, price manipulation, or for some other reasons. Our process aims to filter out such ‘mirage’ coins and markets. It is not a one-off process; module 4 is actively involved in rebalancing the index, so if over time, some coin gets impossible to buy or sell, it will likely be dropped from the index.

### **5th block: rebalancing module**

Every month the system makes a repeated analysis of all the coins, based on the whole dataset collected during the month containing long-term and mid-term factors, including the test purchase, and decides which coins will remain in the index, in which proportion and which ones have to be removed or added. Only then, after these stages are complete are the coins rebalanced, and the composition of the index is complete. The process of the index rebalancing is described in detail in the “What is Rebalancing?” section beginning on page 68 below.

# Zorax is the heart of Cryptoindex platform

Zorax applies a set of calculations to continuously rebalance a basket of the top 100 coins.

The cryptocurrency market is accurately represented on a real-time basis.



Zorax



## What is Zorax?

In previous sections, the particular reasons that have led to the creation of the Cryptoindex 100 were described. In this section, the mechanics of our cryptocurrency index, beginning with our AI algorithm engine, which we refer to as 'Zorax' will be explained in more detail.

**Currently, the perceptions of cryptocurrency market participants and speculators are shaped by a vast body of information across the web, social media and news outlets.** These perceptions then form the exchange rates of various cryptocurrencies. However, only a small amount of information is significant to the cryptocurrency market moves.

**So how can one filter the important information from the less useful noise? How can the potential impact of information be evaluated? How can we use it to make a balanced decision?** Two years ago, the Cryptoindex team started looking for an answer to this question, using the professional experience in the corporate and scientific field, gained as the team has solved the similar problems in the stock market. It became clear that for this task, a combination of AI and astute data sourcing would be required. In the beginning, a massive amount of data about all the trades in all possible pairs since the appearance of Bitcoin was downloaded into the set of Neural Networks. This approach is analogous to technical analysis in classical finance.



Cryptoindex team collected a large dataset from Coinmarketcap and started to backtest it against the various stock market models that had been developed earlier by the team. However, very soon it realized that this approach works poorly for a number of reasons, among others:

- **Crypto trading is decentralized** and 24/7
- **Higher volatility** of the crypto markets compared to the stock market
- **The pattern of the crypto market changes** several times a year
- **The number of participants is growing exponentially**, not in a linear fashion
- **There is no free float**
- **New coins and additional issues of existing coins** are accelerating capitalization of the market
- **A high correlation between instruments** will more likely predict the whole market (capitalization) rather than the coins individually
- **Miscellaneous influence of the sentiment data** in the crypto world: market, social networks and rumors, not official reporting and news terminals

**As a response to the above, Zorax was created to improve the reliability of our models. Zorax was based on three principles:**

- ▶ Use of raw data. Direct data from exchanges (order books & trades) and sentiment data (Twitter, crypto media, Telegram, etc.)
- ▶ Coin rating. Each coin has a calculated rating on the basis of several neural networks.
- ▶ Rebalancing. The index is not static, its composition is dependent on the rating of each coin, updated in accordance with changes in the ratings of coins.



**Data is obtained directly from the largest exchanges. This allows us to form a primary set of 100+ factors**, which considers not only the movements of prices and volumes but also the dynamics of the exchanges themselves, i.e., the transaction clusters.

**To collect this amount of data** (order books and trades from several exchanges in the stream), Cryptoindex developed a data collection and processing infrastructure that could cope with the data volume and the imperfect data flow. The infrastructure developed is based on a number of components of Google Compute Engine.

**In the process of integration and algorithmic testing of various arbitrage strategies**, the Cryptoindex team reached a deeper understanding of how the crypto exchanges work. Unfortunately, there were some difficulties with streaming data from the exchanges. Technical issues created ‘gaps’ in historical data. This presented various difficulties: when exchanges experience technical problems, they omit data for some periods, and/or fail to execute orders.

**Neural networks, based purely on stock data**, were able to forecast indicators (capitalization classes, price change potential, trend, volume growth, price quintile) with a 75%-85% accuracy.



As the next step to improve the quality of information forecast by neural networks, we added other elements, such as sentiment data, from a variety of sources, that in traditional finance is called fundamental analysis:

## GitHub

data about development speed and competencies of developers. Since cryptocurrency is code, GitHub factors have a significant impact on the future of any cryptocurrency.

## Social networks

and forums popular in the crypto world: Twitter, Telegram, Reddit, Bitcointalk. This information allows us to assess not only the frequency of discussion of a particular cryptocurrency, but also the speed of the dissemination of information, the degree of speculative discussions, etc.

## Web

project sites, and crypto media, Google trends, similar web, and other sources. By analysing factors such as number of visitors, project development levels and PR intensity we can assess passive communication between the community and cryptocurrency projects.

**To process streamed sentiment data, text analysis AI was used and the model infrastructure was significantly upgraded through integration of components of search engines and various natural language processing tools.** In order to rebalance the portfolio properly, a separate module that produces all the necessary calculations within one second was developed. The addition of sentiment data increased the accuracy of our forecasts and diversified the index, by allowing us to add cryptocurrencies, which would not otherwise be added if based solely on exchange data. The mix of technical and fundamental analysis approaches united with a set of Neural Networks processing the data without human intervention allowed an improvement of the accuracy of forecasts to about 85%-95%.



Currently, the index is rebalanced once a month, but as the Project develops, it will be rebalanced under the condition of potential portfolio volatility greater than 10%, which will make the rebalancing more frequent and dynamic. Even though a daily update is technically possible, it would be impractical, due to high transactional costs and the fact that many sentiment factors tend to fade away quickly, exposing the portfolio to speculation risks.

**Zorax's self-learning process is steadily continuing. Every day the neural networks receive a continuous set of data, prepared in the form of factors.**

These factors, in turn, continually update the Cryptoindex 100. The system is fed with gigabytes of new information about all the crypto market participants actions every day: tens of millions of trades and orders per day, tens of millions of messages and news. Every day the system double-checks its predictions for the next day and in turn learns to predict with better accuracy with every iteration.

This mechanism of analysis of trade and sentiment data can make Cryptoindex the most advanced predictive and analytical system on the cryptocurrency market.

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**The next goal** is to increase the rate accuracy to 90%-97% in the process of quality self-education of the system, adding new sources of data and new analyzed factors.



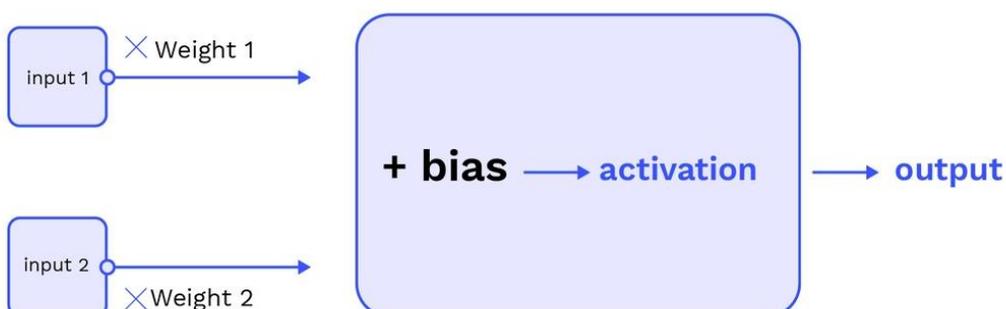
# How Zorax works

## Overview **Zorax is a set of Neural Networks.**

Neural Networks are a subset of Machine Learning methods, which is an emerging field of AI, short for Artificial Intelligence. Other areas of Machine Learning include Classical Machine Learning, Reinforcement Learning, Ensemble Learning; each of those are used in certain conditions.

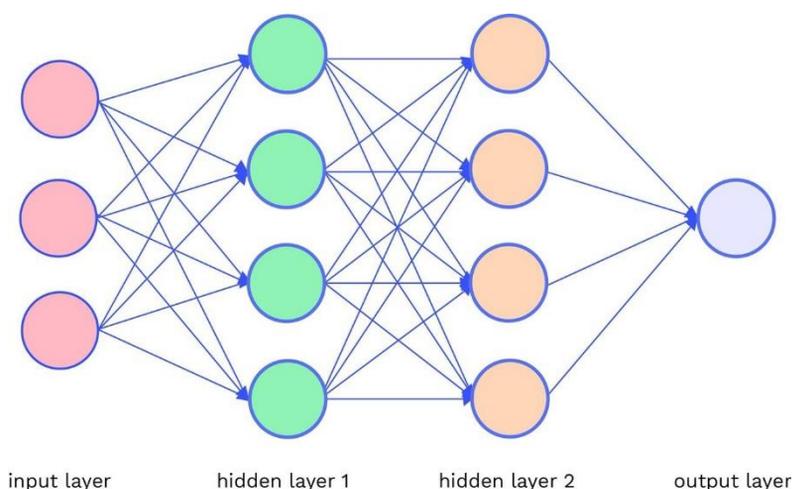
**Neural Networks are usually used when exceptionally large amounts of data are available, and the features and dependencies are not at all obvious.** They can be used for detecting objects on photos, speech recognition, machine translations, computer vision, sequence predictions, and in other circumstances. In our case, use of Neural Networks in an attempt to replace human actions is aimed at tracking the crypto market in the most efficient way.

Any Neural Network consists of so-called neurons, and of connections between these neurons. A neuron is basically a function that takes in many inputs (in the picture below it has only two inputs for the sake of simplicity), performs some calculations on it (in this case it adds a bias to the sum of the inputs each multiplied by their weights, then puts the result through the activation function, and produces the output). Each connection in a Neural Network has a weight assigned to it that has to be adjusted in the process of training. See below:





The neurons in a network are connected into layers, where the neurons inside a layer are not interconnected, but the layers are connected with each other. A simple example of such a structure is below:



**The goal of training a Neural Network** is so that it internally adjusts the weights in such a way that it can identify which connections are more important and which are less important. The Neural Network changes the weights slightly in such a way that after each cycle (a cycle is when inputs go through the entire Neural Network) the output becomes better and better. Here “better” means that the error, or the difference between the predicted output and the actual output becomes minimal. In the end the quality of a Neural Network is measured by how small its error becomes after a very large number of cycles.

The training process starts with the Neural Network learning to predict outputs on test data, which is a part of all the available data where the actual output is known and so the Network can compare its prediction with the real output. In case of Zorax the outputs are classes of coins, where the classes include, but are not limited to, their class according to their returns, their position in the capitalization rating, and other outputs. For example, the position classes are:

- **Class 1 = [position 1, position 2, ... position 10];**
- **Class 2 = [position 11, position 12, ... position 20].**



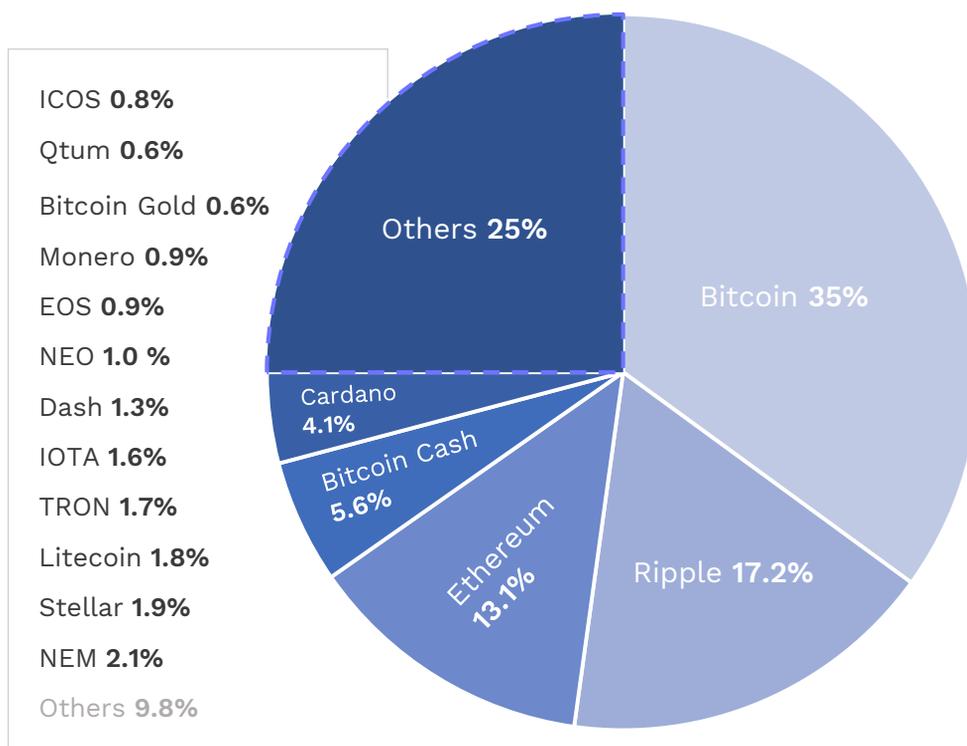
A Neural Network can take a set of factors and produce output, for example, [Class 1]. The ensemble of Neural Networks with different types of outputs comprises ZORAX.

Once this result is achieved, it becomes possible to put together an index that will be comprised of the top coins on the highest positions, with the highest returns, and with the least risk.

## Why are neural networks used for rebalancing?

The best way to analyze all the data and all the extracted factors is to use Neural Networks, because the amount of data and work becomes too large for any other means of analysis. Neural Networks use a lot of computational power and are able to run many cycles to order to improve performance dramatically. This is precisely why Neural Networks were chosen as a basis of Zorax.

An example of cryptocurrency constituents and their weights could look like this:





But if the weights remain fixed, the total sum of prices of all the coins in the index could show unsatisfactory performance. That means that rebalancing, or adjusting the coins and the weights, must take place fairly frequently. In the case of Zorax the difference between the optimal weights predicted by the Neural Network and the current composition of the index are constantly compared, and if the difference exceeds a certain threshold, the rebalancing takes place.

## How is Cryptoindex 100 calculated?

The index is calculated once the weights recommended by Zorax are obtained. All the constituents of the index, their weights, prices, and amounts are always open. The calculation is absolutely transparent.

### Rules for calculation:

- **the sum of the weights for each coin** is equal to 1
- **the price of the index in USD in the beginning of the period** is multiplied by each of the weights in order to obtain the share in USD of the index for each of the coins
- **each coin's share in USD is divided by the coin's price** in order to obtain the amount of that coin
- **the amount of each coin is fixed** during the period
- **the index's price is always calculated as the sum of the amounts of coins** multiplied by their prices, respectively

To illustrate those calculations, let's look at how that happened in April 2018. We won't look at all 100 coins, but just the top 10. At the end of March, the index's price was \$1317096. This is the same price of the index at the beginning of April (the weights of the coins recommended by Zorax for the beginning of April and the list of all 100 coins are in the rebalance example below in the "Rebalancing: an Example" section beginning on page 69 below).



Bitcoin's weight is 14.557%, so its share in USD is \$191726 (column Value of share, USD). After that, we divide that share by the price to get **the amount of BTC:  $\$191726 / \$6973.53 = 27.49$  BTC**. That amount remains the same throughout the period. At the end of the period, **Bitcoin's value of the share in USD becomes  $27.49 * \$9240.55 = \$254055$** .

For all the coins the value of the share in USD is added up, **the price of the index at the end of April was \$2414878**. Thus, **Bitcoin's weight in the index at that time was 10.52%**.

(Note: this is only the first 10 coins in the structure of Cryptoindex)

April		Start of period			End of period		
Currency name	Units of currency	Currency price	Share (weight)	Value of share, USD	Currency price	Share (weight)	Value of share, USD
<b>Bitcoin</b>	27.49 BTC	\$6973.53	14.557%	\$191,726	\$9240.55 (+32.51%)	10.52%	\$254,055
<b>Ethereum</b>	223.13 ETH	\$396.46	6.716%	\$88,462	\$669.92 (+68.98%)	6.19%	\$149,480
<b>XRP</b>	90145.69 XRP	\$0.51235	3.507%	\$46,186	\$0.83794 (+63.55%)	3.128%	\$75,536
<b>Bitcoin Cash</b>	43.04 BCH	\$685.25	2.239%	\$29,496	\$1350.05 (+97.02%)	2.406%	\$58,112
<b>Litecoin</b>	152.58 LTC	\$116.61	1.351%	\$17,793	\$148.48 (+27.33%)	0.938%	\$22,656
<b>Gas</b>	802.57 GAS	\$15.76	0.96%	\$12,648	\$29.65 (+88.13%)	0.985%	\$23,796
<b>Hshare</b>	2211.26 HSR	\$5.7	0.957%	\$12,604	\$11.04 (+93.68%)	1.011%	\$24,412
<b>Golem</b>	62392.19 GNT	\$0.20091	0.952%	\$12,535	\$0.5564 (+176.94%)	1.438%	\$34,715
<b>Ardor</b>	55300.52 ARDR	\$0.22543	0.946%	\$12,466	\$0.39988 (+77.39%)	0.916%	\$22,113
<b>DigiByte</b>	704523.84 DGB	\$0.01762	0.943%	\$12,414	\$0.04053 (+130.02%)	1.182%	\$28,555



# Zorax Work Process

After data collection, data pre-processing, and factor extraction, the following happens:

**Test batches.** The pre-processed training data is split into batches of size between 32 and 128, where each day has a dimension of days between 30 and 180 and a dimension of a number of calculated factors. These batch sizes are a common choice in Neural Network training. The input tensor has the shape batch size/days/number of factors. The optimal size is chosen for the most effective training of the network and depends on the architecture and computational power.

**Neural network training.** The Neural Network is built using TensorFlow. It takes time series tensors as input and learns to predict a number of outputs in the future. More target outputs will be added to Zorax. After training, the neural network makes predictions on the test set, and the results of the predictions are compared with the actual data. The error is calculated as cross-entropy between the actual and predicted outputs, and the accuracy function is the argmax. The network does not learn from the test data for predictions.

**Performance Metrics.** TensorBoard generates visualizations for the Neural Network performance. The error is measured using cross-entropy. The mathematical definition says that cross-entropy is “used to quantify the difference between two probability distributions” , but in order to get a clearer idea, let’s look at an example.



### Example – a Cross-entropy calculation

Suppose we have 3 labels, or Classes, numbered 1, 2, and 3. Let's say that for a particular input the real Class is 2. Then, the true distribution for this input is:

- ▶ **Probability(Class 1) = 0**
- ▶ **Probability(Class 2) = 1**
- ▶ **Probability(Class 3) = 0**

This means that there is 0% probability for the training instance to belong to Class 1 or 3, but 100% probability for it to belong to Class 2.

If the Neural Network produces the following probability distribution as the predicted output:

- ▶ **Probability(Class 1) = 0.328**
- ▶ **Probability(Class 2) = 0.517**
- ▶ **Probability(Class 3) = 0.155**

We can measure the distance between the predicted distribution and the true distribution by using the cross-entropy loss. The formula for the two above distributions is:

$$H(p, q) = - \sum p(x) \log q(x)$$

Here  $p(x)$  is the true probability, and  $q(x)$  is the predicted probability. The sum is over the three classes 1, 2, and 3. The cross-entropy loss is equal to 0.6597:

$$H = -(0 \times \ln(0.328) + 1 \times \ln(0.517) + 0 \times \ln(0.155)) = 0.659$$

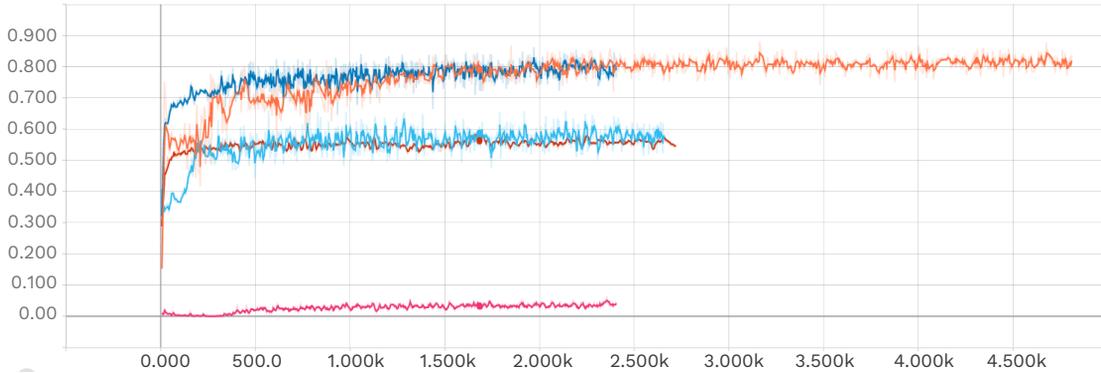
This is the measure of how "wrong" or "far away" the prediction is from the true distribution.

Accuracy, on the other hand, calculates how often predictions match the true result. 1 means perfect accuracy, 0 means no correct predictions.



The visualizations are shown on TensorBoard. Below we can see on the accuracy and error charts that for some target outputs the accuracy reaches 80% and the error is very low. The target outputs that are not well predicted are either excluded from the outputs or different hyperparameters are chosen.

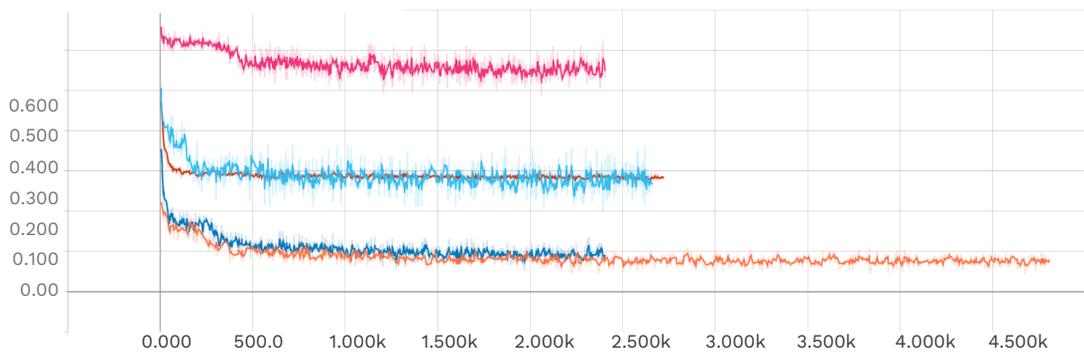
accuracy/accuracy\_1



Name	Smoothed	Value	Step	Time	Relative
train_position	0.7904	0.7850	1.683k	Fri Jul 6, 15:15:23	26m 12s
train_position1	0.7911	0.7921	1.683k	Fri Jul 6, 18:14:58	36m 9s
train_quartet	0.5868	0.6085	1.683k	Fri Jul 6, 18:22:07	37m 15s
train_returns	0.5626	0.5580	1.683k	Fri Jul 6, 18:19:26	38m 49s
train_trend	0.03287	0.02839	1.683k	Fri Jul 6, 18:27:41	37m 23s

Fig.: accuracy growth with timesteps for position, position class, quartile, returns, and trend

cross entropy/cross\_entropy

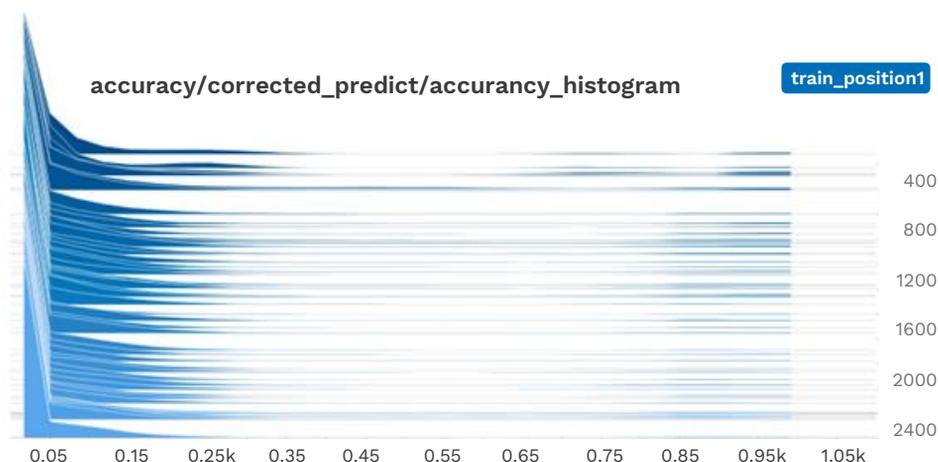


Name	Smoothed	Value	Step	Time	Relative
train_position	0.07563	0.07940	1.611k	Fri Jul 6, 15:14:19	25m 9s
train_position1	0.08875	0.08660	1.611k	Fri Jul 6, 18:13:26	34m 37s
train_quartet	0.2947	0.3036	1.611k	Fri Jul 6, 18:20:36	35m 45s
train_returns	0.2890	0.2850	1.611k	Fri Jul 6, 18:17:51	37m 13s
train_trend	0.5498	0.5549	1.611k	Fri Jul 6, 18:26:13	35m 54s

Fig.: cross-entropy (error) decrease with timesteps



Below we see the histograms showing the number of times when the accuracy was equal to a particular value between 0 and 1 on the x-axis. The graphs below have a time axis (it creates layers which visually appear to sit one behind another) so the graphs that are at the forefront of the image represent later time. As we move in time and the Neural Network trains, the image appears to be moving towards us. The performance is becoming better if with that movement the layer shifts towards the left (or towards 0 on the x-axis), which means that more and more time the predicted output is close to the real output and the distance (norm) between them is small. We can see that the position class shows the best results (blue), the returns are predicted slightly less accurately (dark orange), and the trend predictions are less accurate yet (pink), although the improvement of the network is clearly seen on the diagrams.



FigFig.: histogram of norm (distance) between real and predicted vectors for position class (0 norm for the same vectors, 1 for the largest possible distance)

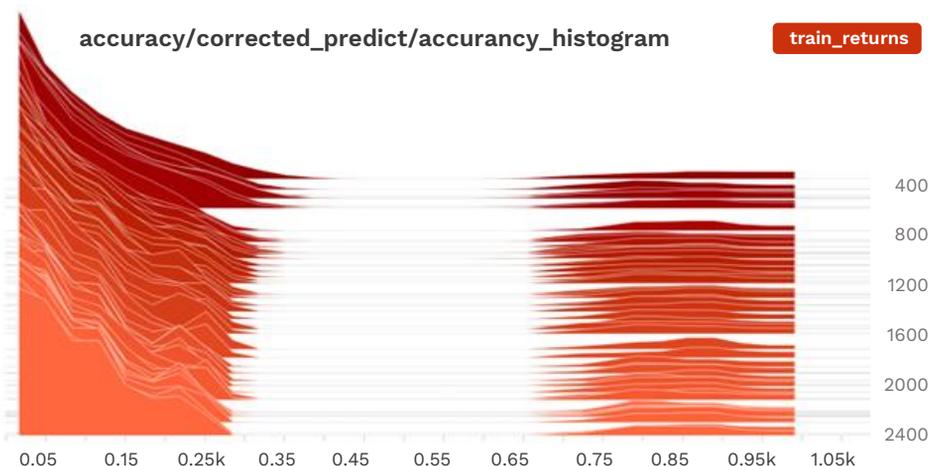


Fig.: histogram of norm between real and predicted vectors for returns class



accuracy/corrected\_predict/accuracy\_histogram

train\_trend

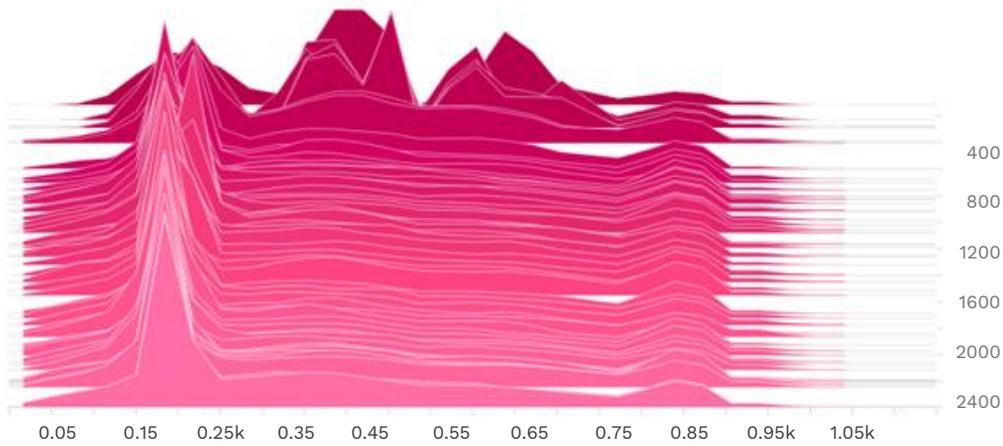


Fig.: histogram of norm between real and predicted vectors for trend class

Achieving high accuracy is important because this allows us to correctly identify the coins on the highest position in the capitalization rating and with the highest returns.

## Zorax architectures

### Overview

Various popular architectures of Neural Networks include Perceptrons, or single-layer networks, Convolutional Neural Networks, Recurrent Neural Networks, Autoencoders, and others. The architectures that have been tested during the research phase include TCN (Temporal Convolutional Network), Deep Convolutional Networks, and others.

### Schematic descriptions of used architectures

A TCN does not allow information to be leaked from the future to the past, so their architecture is called “causal”. It can take a sequence of a fixed length and map it into a sequence of the same length. What is particularly important about TCNs is dilated causal convolution layers, which means that at time T a filter sees inputs at no later than time T.

A good illustration of that is below:

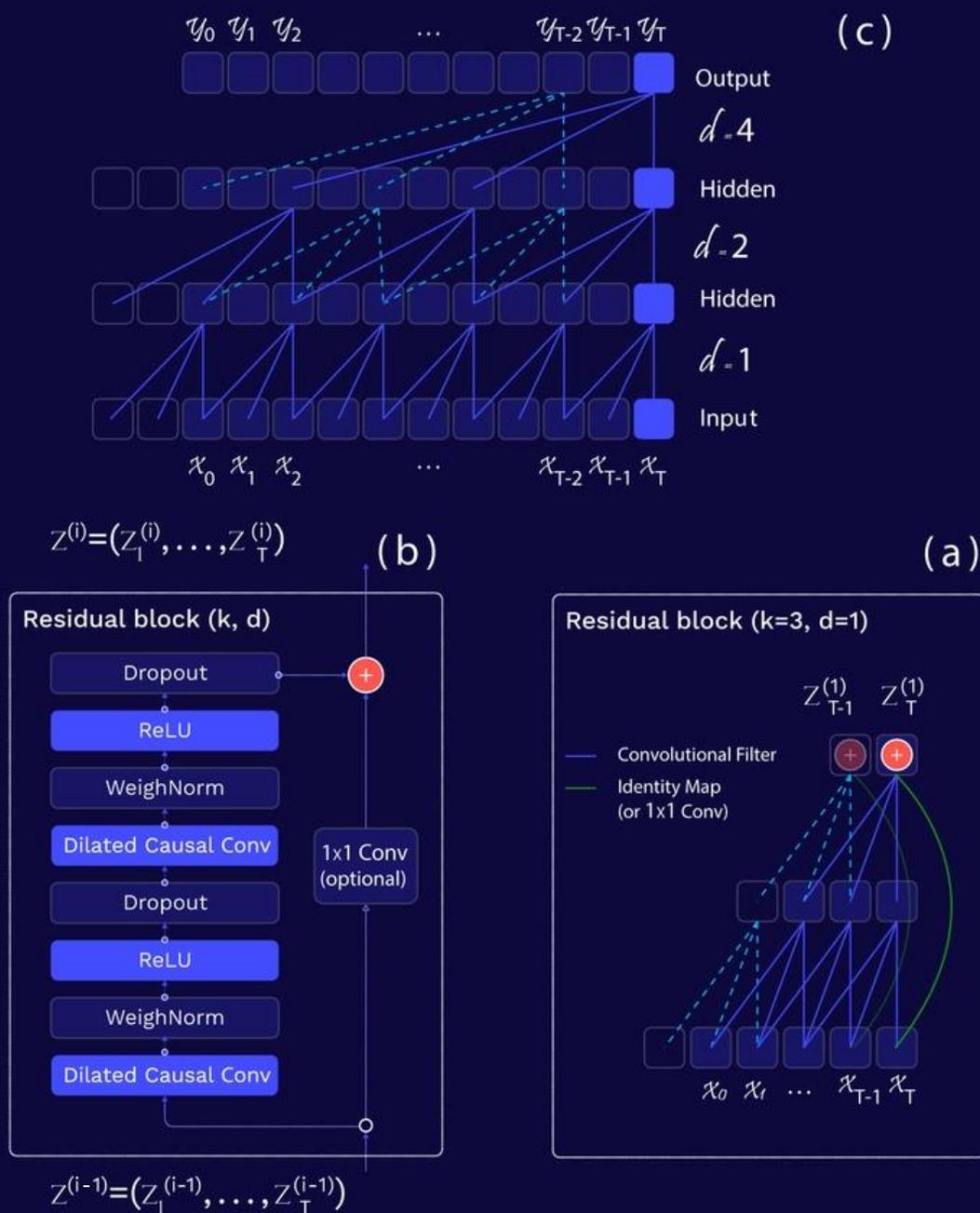


Figure 1. Architectural elements in a TCN, (a) A dilated causal convolution with dilation factors  $d = 1, 2, 4$  and filter size  $k = 3$ . The receptive field is able to cover all values from the input sequence. (b) TCN residual block. an  $1 \times 1$  convolution is added when residual input and output have different dimensions. (c) An example of residual connection in a TCN. The blue lines are filters in the residual function, and the green lines are identity mappings.

Source: *An Empirical Evaluation of Generic Convolutional and Recurrent Networks for Sequence Modeling* - Shaojie Bai, J. Zico Kolter, Vladlen Koltun

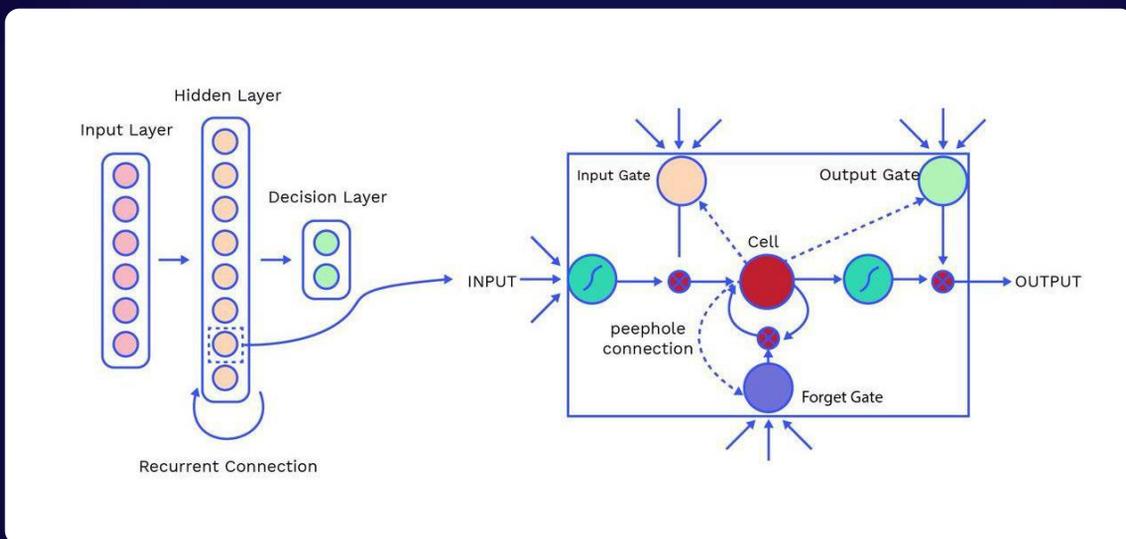




A residual block stacks two dilated convolutional layers together, and then the TCN stacks these residual blocks in order to get a receptive field of the desired size. The fewer layers there are in a TCN, the more backdated history has to be given up. A TCN attempts to be more compact by having fewer layers in the architecture.

An LSTM, or Long Short-Term Memory Neural Network, is a type of Recurrent Neural Network (RNN). ZORAX’s network architectures include LSTM layers, convolutional layers, recurrent layers, and aim to maximize accuracy. New architectures are constantly tested and explored.

An LSTM Neural Network is built of LSTM units. Such a unit consists of a cell, input and output gates, and a forget gate. The cell of the LSTM unit learns to adjust how much of the previous information to “remember” (hence the term “Memory”), so it regulates the flow of inputs through the Network by blocking or letting information pass on. With each cycle the weights of the gates also update. This is the cell’s learning process. See an example of LSTM unit in the figure below:





The rebalancing decision is a very complicated process inside the Neural Network. Each neuron takes a large input tensor and performs calculations on it to produce an output tensor that is passed on to the next layer. The input tensor consists of the following:

[feature 1, feature 2, ..., feature i, ..., feature n] = [capitalization, daily traded volume, ... , volatility, ... , position in the capitalization rating], where the features are the different factors extracted from the available collected data.

**Each coin in Cryptoindex 100 has such a vector of factors for each day when the data collected and the factors were calculated. Hence the term ‘input tensor’ and its dimensions:**

for example, a 1000 coins with 170 factors extracted for every coin and calculated every day during 365 days would be an input tensor of size 1000 x 365 x 170. This large input tensor is split into smaller parts, that are called mini-batches, and are fed into the Neural Networks. After that, the Neural Network starts to adjust its connections’ weights in order to identify internally which factors are the most significant, and how far into the past it needs to “remember.” When the inputs reach the output or decision layer, the Neural Network produces its target output. With each cycle, the predicted outputs become closer and closer to the real output, and the Neural Network understands that it is improving its performance.

**The output that Zorax produces is classification by categories.**

All the coins can be rated by their position in the capitalization rating, by returns, by their price relative to their highs and lows, etc. Thus Zorax consists of several Neural Networks where each one is actually a classifier that creates ratings of coins. The ratings that are produced as output by the Neural Networks are merged into one rating which indicates which coin should receive more weight or should be included in the index, and which shares in the index should be reduced. The detailed weight calculation process is described in more detail below.



## The Weights Calculations

The final weights are calculated after the rating of the strongest coins for the upcoming month is obtained. Every coin in the list of candidates has its current capitalization, and each coin has a strength factor:

$$\text{Bitcoin} : (Cap_{BTC}, f_{BTC})$$

**The strength factor is a numerical coefficient that the capitalization is multiplied by.** The maximum and minimum value of the strength coefficient depends on the current position of the coin in the capitalization rating, for example, assuming that Bitcoin will remain on the first position in the nearest future, we restrict its capitalization movement to 10% up and 12% down (these numbers are exemplary, although they reflect the actual factor strength limits):

$$f_{BTC} \in [f_{BTC}^{min}, f_{BTC}^{max}]$$

**The neural networks prediction is mapped into the interval,** with the best prediction mapping into the right end of the interval and the worst prediction mapping into the left end of the interval. In the above example the right end is equivalent to the multiplier 1.1 (10% up) and the left end is equivalent to the multiplier 0.88 (12% down).

**The factor strength limits are calculated directly from the position number,** and are constructed in such a way that a coin in the top of the rating does not move very far in the rating even

if it shows very strong or very low potential, and, on the other hand, a coin further down has the opportunity to jump much higher in the rating and reach the top 100. After each coin's capitalization is multiplied by its predicted strength factor, the coins are sorted by their factor adjusted capitalization, and the new top 100 coins are weighted proportionally to their factor adjusted capitalization.

$$\omega_{BTC} = AdjCap_{BTC} / \sum_{i=1}^{100} AdjCap_i$$
$$\omega_{ETH} = AdjCap_{ETH} / \sum_{i=1}^{100} AdjCap_i$$





# Principal Blocks

Zorax consists of three principal blocks containing five modules in total, as follows:

## Block 1 Acquisition Platform

This block collects information from data feeds and performs initial processing of collected data.

### The block consists of two modules:

**Module Data Acquisition** which is used to scroll data sources and acquire the following raw data:

- ‘Exchanges’ represent an entry point for data from crypto-exchanges. This module collects financial data acquired from exchanges.
- ‘Sentiment data’ represents an entry point for data from other public and open sources feeds that may be of potential interest for efficient system operation.

**Module Data Analysis** which provides analytical support to coin inclusion and weighting decisions, based on financial statistical data.

In order to work properly and transparently the block uses a set of predefined lists and filters:

- Criteria for exchanges inclusion
- Filters for coins
- List of sentiment data sources; and
- List of rules for priority definition

## Block 2

### Zorax

This block is responsible for analysis of the primary processed data, setting the Zorax index value, creating of the portfolio and sending data to the Analytical and Trading platforms:

- Rules for weights calculation
- Rules for coin inclusion/exclusion
- Index Formula calculation

#### The block consists out of 2 modules:

**Neural networks** receives data supplied by the acquisition platform and converts it into a set of factors, after which the factors are supplied as starting material for predictive analysis and model learning of neural networks. The predicted indicators are converted into a flow of commands for the calculation module.

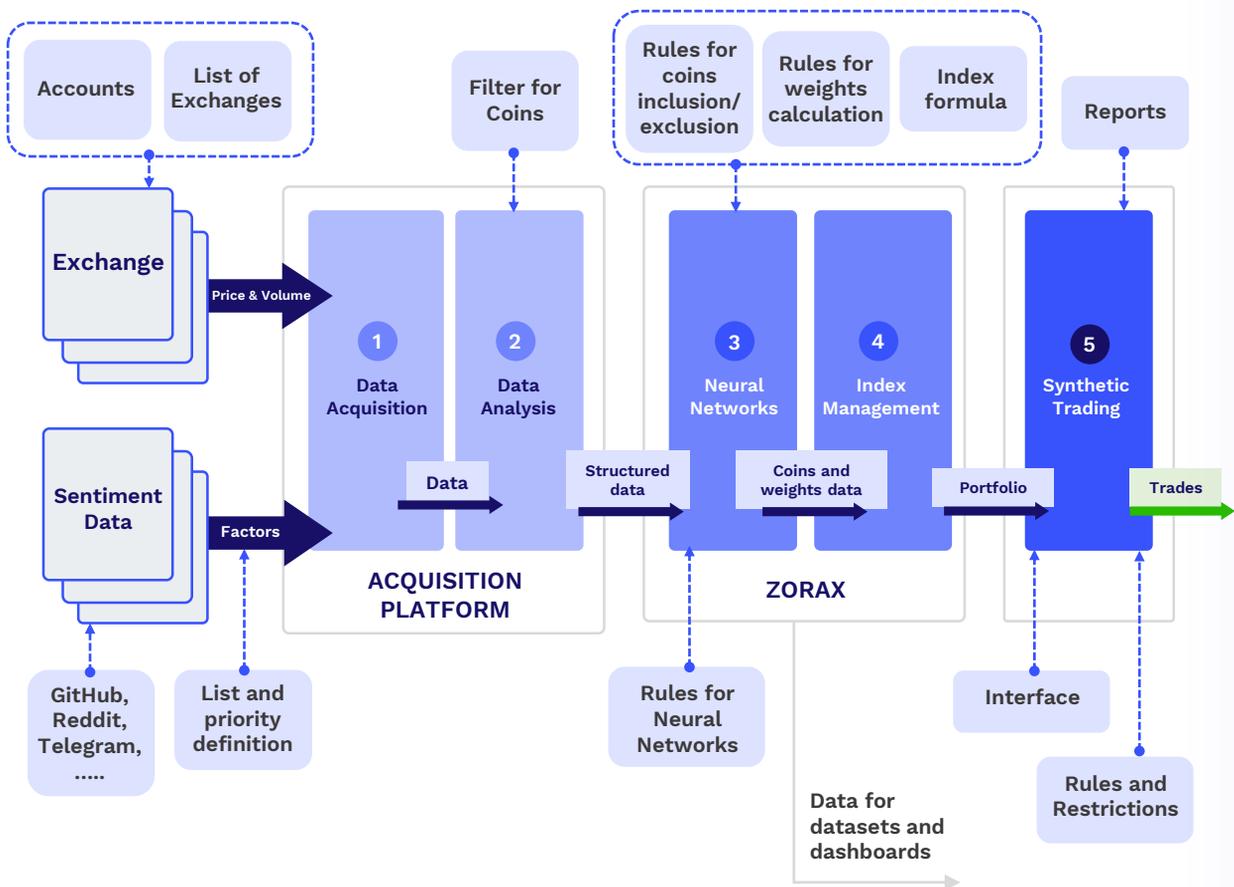
**Index Management** controls the flow of commands on various target platforms exchanges and provides feedback for the neural networks module.



## Block 3 Synthetic Trading

This block is a synthetic trading module for portfolio rebalancing operations. The block allows us to carry out hypothetical, i.e. 'synthetic' trading operations and work with Zorax data and a 'synthetic' portfolio obtained on the basis of Zorax. The block consists of a platform interface and a back-end which prepares and formats the data for correct display.

The control service gives synthetic orders to executing robots and ensures that Zorax is performing portfolio rebalance. A synthetic trade robot is a separate system that is integrated with one or several exchanges and carries out synthetic operations coming from the control service of synthetic robots.



# Data Acquisition



Hundreds of crypto instruments, thousands of crypto assets, social networks, thousands of media portals and hundreds of millions of users interested in crypto generate a huge amount of data that has a significant impact on crypto assets and the crypto world in general. Considering that it is almost impossible for a non-professional participant to understand this data flow independently, and the importance of this data for the Cryptoindex 100, it is a critical element of value creation in our product.

## Exchange data

To collect market data, we connected our platform to the largest crypto exchanges. There are certain criteria that an exchange must meet in order to connect to us:

- **Average daily trading volume** - more than U.S. \$ 130,000,000
- **Jurisdiction** - USA, UK, Malta, Hong Kong, Singapore, Luxembourg, South Korea
- **Currencies** - Bitcoin and Ethereum among the top 10 traded currencies
- **Trading pairs** - minimum 10 trading pairs
- **Data streaming** - available

As a result, we are currently connected to, and are streaming data from 9 crypto exchanges:

- **OKex** (<https://www.okex.com>)
- **Binance** (<https://www.binance.com>)
- **Huobi** (<https://www.huobi.com>)
- **Bitfinex** (<https://www.bitfinex.com>)
- **Bittrex** (<https://bittrex.com>)
- **HitBTC** (<https://hitbtc.com>)
- **Kraken** (<https://www.kraken.com>)
- **Poloniex** (<https://poloniex.com>)
- **Bitstamp** (<https://www.bitstamp.net>)

Trade data that is collected from the crypto exchanges include a timestamp, trade ID, price, volume, direction. This data is collected at a frequency of 500ms enabling our algorithms to respond quickly to changes in the market.

## Sentiment data

Sentiment data sources can be divided into the following classes:

- **Crypto websites**
- **Messengers, social media and other news feeds**
- **Keyword metrics and metric sources**
- **Crypto keywords database sources**

In order to determine a results list of sentiment data sources, the following metric groups were defined:

- **Keywords mentions** in sources
- **Keywords presence** in recently registered domain names
- **Dynamic of visits**
- **Token site** referring sites
- **Other** (i.e. Github or Google trends)

The total set of sentiment data sources was analyzed by our AI and natural language processing tools in order to be in correlation with metrics. As a result, the following list of sentiment data sources was formulated, the data from which, is acquired and processed by Cryptoindex:

- **Github**
- **Twitter**
- **Telegram**
- **Reddit**
- **Bitcointalk**
- **Google trends**
- **StackOverflow**
- **CoinMarketCap**
- **2000+ project sites**
- **Crypto news and information websites**
- **Mass media websites**





The frequency of data collection from Sentiment data sources is determined by the settings of the data acquisition block and the way it connects to the source: from the real-time update for Telegram chats, to several times a day for some news sites.

The emergence of new sources of data occurs constantly, therefore:

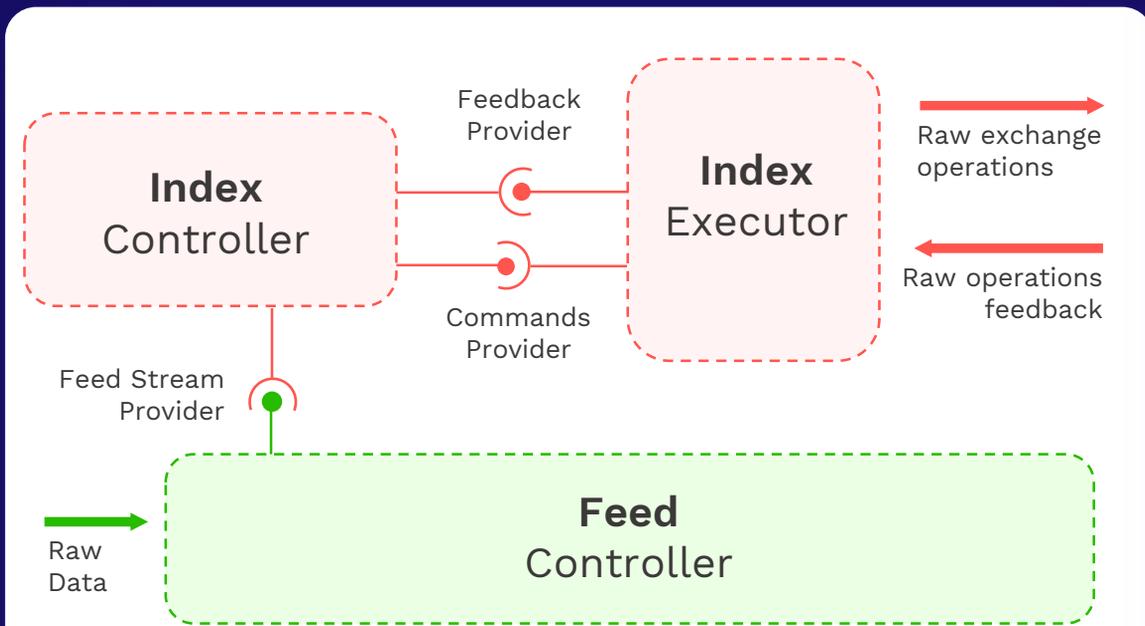
- **For the data acquisition, we developed a standardized API** that allows quick connection to new exchanges and other data sources; and
- **We constantly analyze information** from the crypto world in order to identify promising data sources.

Currently the Cryptindex 100 system collects and processes millions of signals daily. Since the launch of the Cryptindex, the amount of accumulated data has exceeded any other offer on the market.



# Acquisition Platform Components

A simplified diagram of the component architecture of our data collection and analysis platform is as follows:



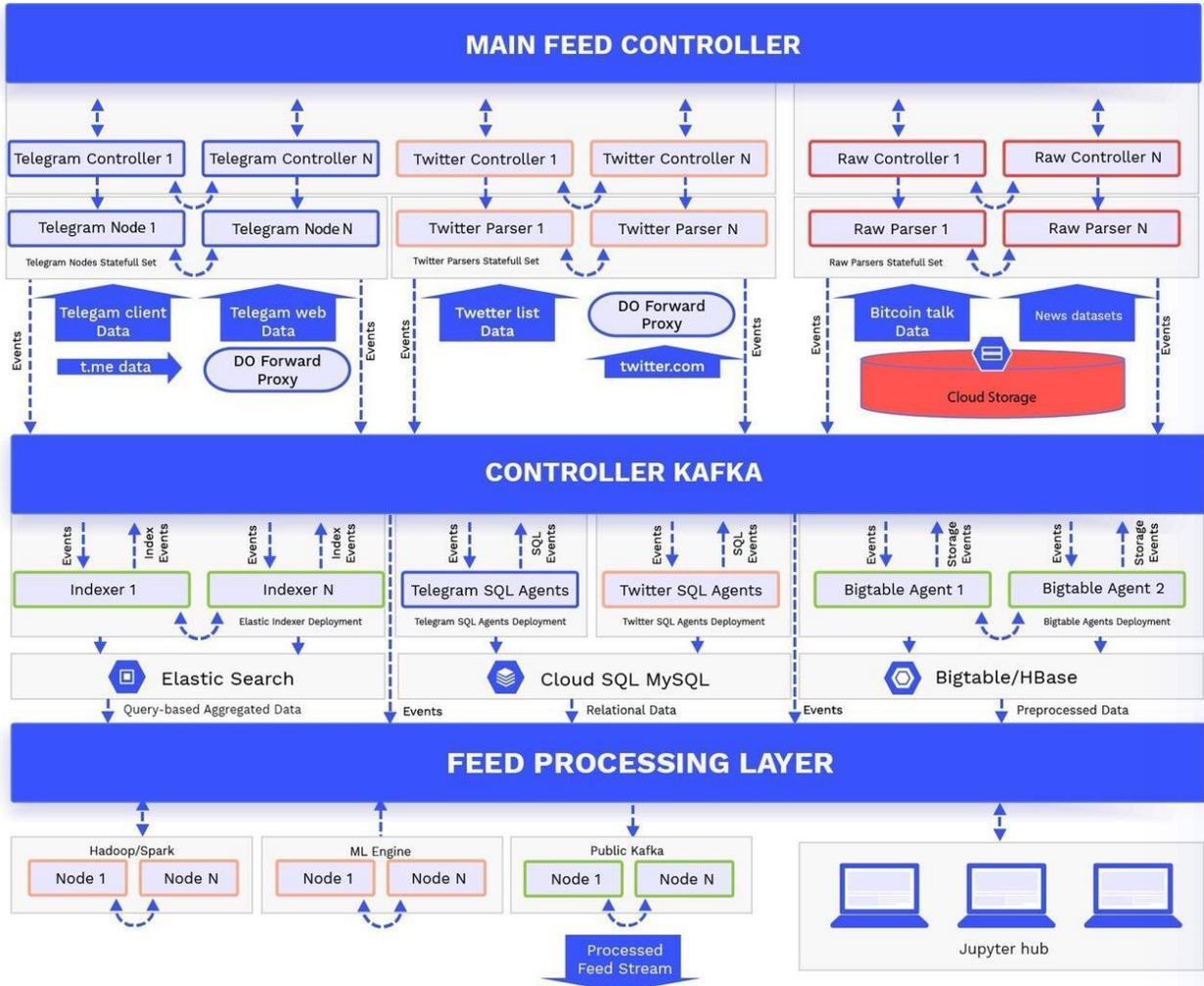
**Acquisition platform consists of following components:**

**Feed Controller** - collects and processes raw data from various sources, for example: cryptocurrency prices, text data from Telegram, Twitter, Reddit, StackOverflow, Bitcointalk and other sources, data from source repositories (Github), media data, etc. All data undergoes preprocessing, linguistic analysis, frequency and N-gram analysis. The data is then converted to events and delivered as a continuous stream to other platform components.

**Index Controller** - subscribes to events supplied from the Feed Controller and converts them into a set of factors, after which factors are supplied as a source material for predictive analysis and model learning. The predicted metrics are converted into a flow of control commands for Index Executor.

**Index Executor** - executes the flow of commands on various target platforms/exchanges and provides feedback for the Index Controller.

The following figure shows a simplified diagram of the component architecture of the Feed Controller.



## 1. Main Feed Controller

controls all child controllers, task queues and statuses of their execution. Provides an access interface for system administration.

## 2. Telegram Controller

controls the dedicated slot of the Telegram client via a dedicated REST interface. Performs constant verification of the slot, monitors its status and configuration. Manages the task of obtaining information about the channel/user, tasks for subscription and unsubscribe, as well as tasks for downloading history. The controller has an integrated scheduler that guarantees the safe operation of the monitored node.



### 3. Telegram Node

the executing team of the Telegram client. The client provides a dedicated REST interface for management. The client processes all events in real-time such as notifications about new messages, people, chat mentions and external links, information about the entry and exit of users from groups, etc. All events are transmitted to the queue for further processing by the system.

### 4. Twitter Controller

manages the Twitter client slot, works analogously to the Telegram controller.

### 5. Twitter parser

executes the commands of the controller, connects to predefined lists via Selenium and a number of Forward Proxy to get all the tweets of the list in real time. Supports the functions of downloading the history of tweets from a particular account. All events are transmitted to the queue for further processing by the system.

### 6. Web Crawler Controller

manages the crawlers for websites. We need a lot of crawlers to parse thousands of sites every day.

### 7. Crawler

horizontally scalable application that performs the main job of downloading content and retrieving information from a web page.

### 8. Raw Controller

controls static data parsers.

### 9. Raw Parser

the implementation of the static data parser, receives control commands from the controller, connects to a specific GS section and converts some of the static data, transmitting it into the event queue for later processing by the system.



## 10. Github Controller/Client, Price Controller/Client, etc.

operate by analogy with the above components of the system.

## 11. Controller Kafka

the main queue of system events which provides a communication interface between all the elements of the system and scales any groups horizontally based on the design of each message topic.

## 12. Elastic Indexer

Elastic Search Server client, subscribes to all system entity updates, performs direct indexing of system objects.

## 13. SQL Agent

is a client of the cloud SQL server, subscribes to all updates of the system entities, directly stores entities in the relational scheme.

## 14. Bigtable Agent

Bigtable server client, subscribes to all system entity updates, directly stores entities in Bigtable.

## 15. Feed processing layer

aggregates, processes and converts the original events into events required by external services. Provides an access interface for programming machine learning models through the Jupyter Hub. Provides an interface to access the Dataproc / Hadoop Data Analysis Cluster and the ML Engine / Tensorflow Learning Cluster.

## 16. Feed Kafka

public interface of events for external services, processed events are transmitted in various topics of the external queue. The queue is persistent and stores events for the last week, which makes it possible to roll them again in a short time interval.



# Data Analysis

**The data collected from various sources is sent to the Acquisition Platform.** This block is designed to supply Zorax with processed, analyzed and structured data for the operation of neural networks. To optimize this task and to increase the efficiency of Zorax, when Acquisition platform collects data it is also adding new attributes. Addition of new attributes is a significant data enrichment in order to improve the quality of Zorax's work.

**The decision to include a cryptocurrency in the portfolio is made on the basis of the array of incoming data and the factors analysis. Decisions can be based on the following factors:**

- release of positive news
- release of a new product
- platform upgrade
- increasing interest in a particular currency
- increase of traded volumes
- a stable positive trend on a crypto exchange
- strengthening the position of the specific cryptocurrency in the rating over time; etc.



As a result of the enrichment of the data, the factors can be conditionally divided into three groups. The following list describes these groups of factors employed in the Acquisition Platform:

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**Price factors** data attributes obtained on the basis of market data on prices and volumes of trade received from stock exchanges. Market data is used to calculate the correlations, volatility, trends, range and other derivative information that determines a particular factor.

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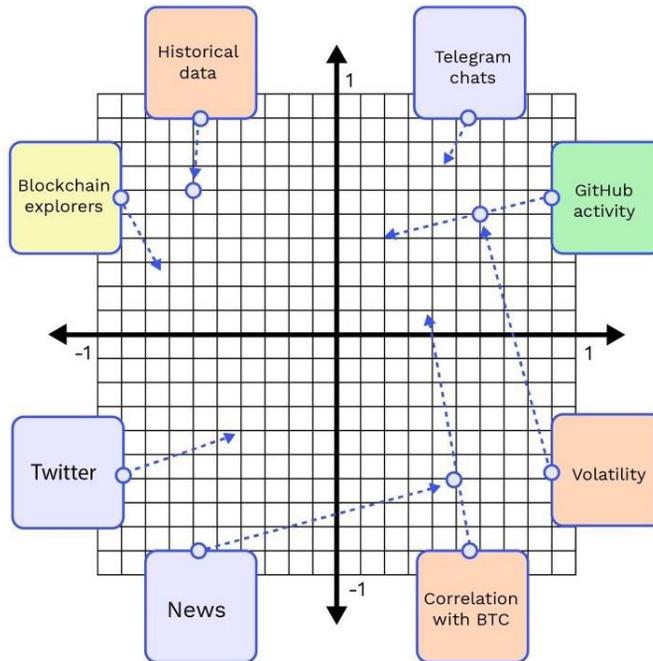
**Speculative factors** data attributes obtained on the basis of stock data on trades and order books. The speculative factors are used in the same manner as the price factors to calculate coins' ratings, which are used as the basis for the decision about coin inclusion or exclusion.

---

**Sentiment factors** data attributes obtained on the basis of sentiment data. The collected text data is preprocessed, and then submitted to the input of the thematic modeling algorithms, which determine the theme of the text, keywords, mood and other market-oriented valuable information.

The list of factors is constantly updated. This is necessary due to changes in the crypto market and the need to constantly improve the quality of work of Zorax neural networks. As an example, some of the basic factors used in the system are given in **the Annex 1 (“Zorax Factor Library”)** beginning on page 132.

After extraction, the factors are normalized, by grouping in data types and particular factors are reduced to one type suitable for processing by Zorax's neural networks (see figure below).



## Aspects of the Use of Factors and Examples

Particular attention should be given to 3 aspects:

- 1.The effect of sentiment data** and factors on the composition of the portfolio
- 2.The effect of speculative data** and factors on the composition of the portfolio
- 3.Initial analysis of the cryptocurrency**

for inclusion in the expanded list to form a portfolio.

### The Effect of Sentiment Data and Factors

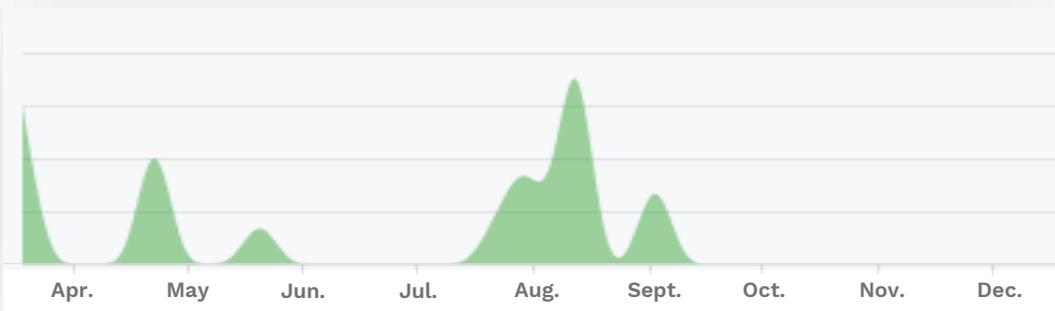
Analysis of sentiment data and factors allows us to determine the information background of the media, social networks, blogs, similar to the dynamics of Google search queries, but having a wider coverage with deeper elaboration of individual topics related to specific crypto assets. According to our calculations, the effect of sentiment factors on certain cryptocurrencies at certain time intervals reaches 25%.



## Example DubaiCoin

Consider the effect of sentiment factors on an example. During our analysis of sentiment data, one of the first sources of sentiment data was GitHub. According to this source of data, we had many hypotheses, one of the strongest signs was the freezing of the project. If the development community does not grow, there is no foresight for the cryptocurrency, and even less if development of the project has stopped - then the cryptocurrency will most likely fail in its potential, even if speculative trading continues.

**This cryptocurrency was in our portfolio in October 2017, based on the price and volume factors. But based on GitHub factors, it should not have been there at all, if one looks at its frozen development (see figure below).**



**In order to reduce the probability of such projects appearance in the index in the future, we added a sentiment GitHub factor to ZORAX, which made it possible to exclude or greatly reduce the share of projects where development stalls. Nowadays it has become completely clear that the intensity of the project development has a very strong effect on the potential of the cryptocurrency. This is confirmed in our example of DubaiCoin.**



**The value of the coin tends to be equal to zero.**



## Example Madana

The Madana team launched an ICO for their project built on Lisk blockchain and held a road-show around Asia with presentations. It positively affected the price of Lisk, which we can see on CoinMarketCap, and on search trends:

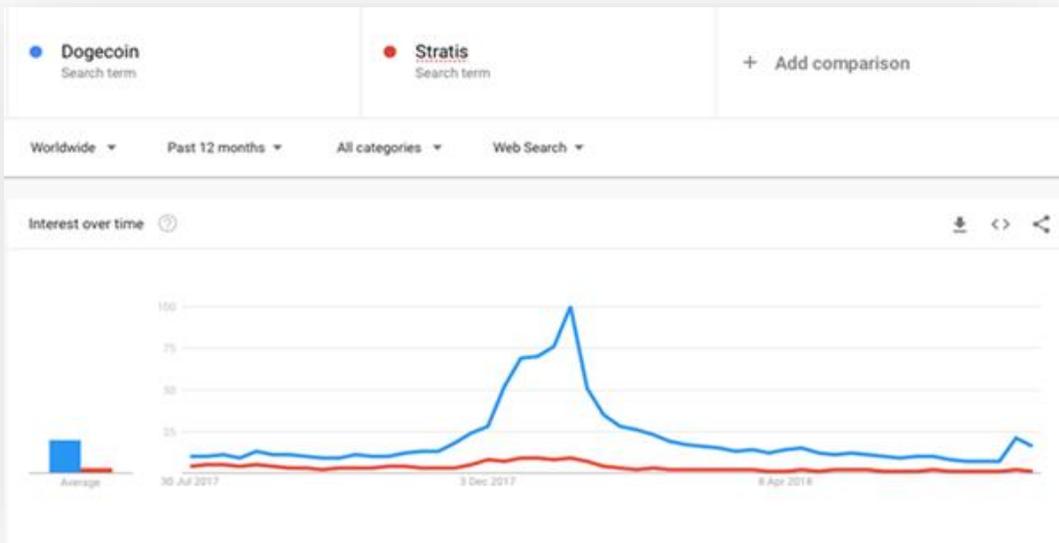


## Example Dogecoin vs Stratis

Let's have a look at an example of positive sentiment factors. An example is Dogecoin. The cryptocurrency may receive a higher rating than a different coin due to its positive sentiment factors and positive price dynamics. If a coin shows negative price dynamics, it may easily be lower ranked than Dogecoin. This is exactly what happened with Dogecoin VS Stratis:



For example, Dogecoin VS Stratis. Google Trends (see figure below).



Reddit (see figures below).

COMMUNITIES AND USERS

 <b>r/dogcoin</b> 120k Subscribers	 <b>r/Stratis</b> 5.1k Subscribers
 <b>r/dogcoindev</b> 1.9k Subscribers	 <b>r/stratisplatform</b> 10.9k Subscribers
 <b>r/dogcoinbeg</b> 3.3k Subscribers	 <b>StratTrader</b> 1.0k Subscribers

The average number of posts in the branch on DogeCoin is tens of times greater than in the Stratis branches.

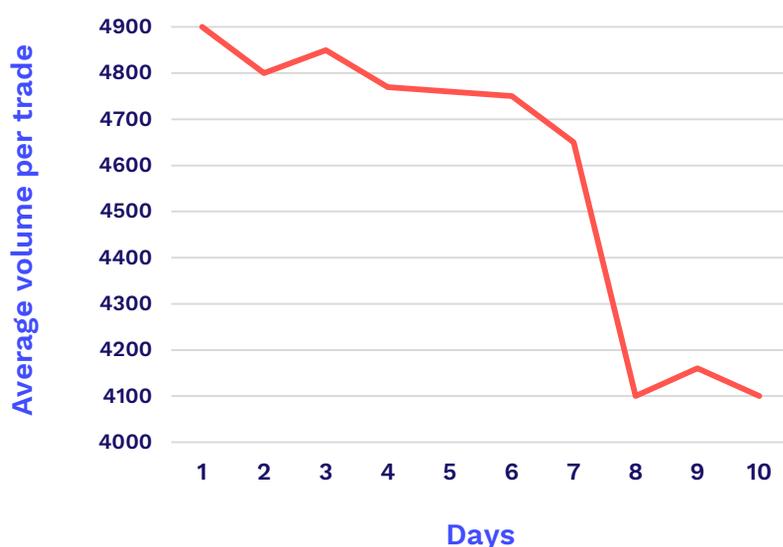
As a result of the effect of sentiment factors, DogeCoin received a positive shift in some of the periods and Stratis's weight was decreased.

## The Effect of Speculative Data and Factors

The following Trades and order books analysis allows us to calculate coin ratings much more precisely as opposed to the case when only the price data and factors are used. Let's look at examples of how speculative factors can affect the index.

### Example the Average Volume-per-Trade Trend

The following image shows the dynamics of the average trading volume in BTC per trade for one of the coins.



An example of a negative factor can be the average volume-per-trade downtrend. The dynamics that we see above show that the amounts traded within each trade is going down, and that gives less force to price movement. If such a factor is supported by decreasing trading volumes, lower Google trends, or price, then it may serve in favor of coin exclusion or weight decrease.



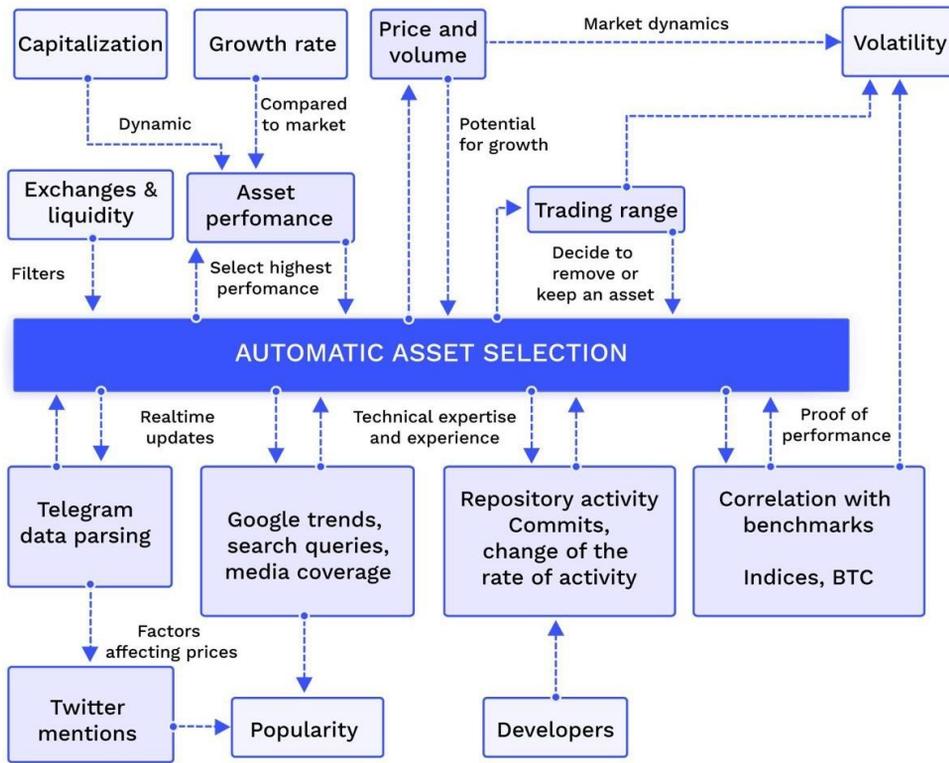


## Example Price dynamics

Another factor indicating either positive or negative price dynamics is the delta formed between the bid/ask volume, with the momentum forming in the direction from the bigger volume towards the lower volume.



In the figures above we see that the price shifts towards the right. Dramatic figures with empty bid zone and high ask zones may show that a coin is being sold heavily and it is a negative signal for a coin's performance.





# Index management

## Index composition

**Filters.** Traditionally, an efficient index is the one that incorporates all the investable assets weighted by their market capitalization, which allows exposure to the assets and simultaneously minimize the risk exposure.

After Zorax produces a merged rating from the outputs of the Neural Network, the rating undergoes three processes.

**First, the rating is put through a set of filters that apply regardless of how high the coin's rating is. The set of filters is the following:**

- **The coin has a trade history** of at least 3 months.
- **The coin is listed on at least one of the exchanges** that we collect data from.
- **The coin is among the top 500 crypto currencies** by market capitalization.
- **The coin is not included in any other type of index**, it is not fiat-based (such as USDT), and it is not based on any kind of commodity or other asset.
- **The coin is not involved** in any scams or scandals, delisting or lawsuit.
- **In the event a coin fails to meet any of our required criteria at any given time**, it will be excluded from the index and is synthetically sold. The next best coin recommended by the AI at that moment is synthetically purchased instead of the excluded coin.



The filters allow us to make sure that no coin that does not have proven stability, quality, popularity, or potential, will have the opportunity to be included in the index.

The second process is calculating the capitalization-weighted index of the top 100 coins in the rating that have undergone the filters. This “global crypto market index” aims to expose cryptocurrency users to all the types of projects on the market (such as computing, storage, interoperability between blockchains, multi-currency wallets, gaming, marketplaces, etc.) and to minimize risk exposure.

The third process takes place after the cap weighted index has been formed. The output ratings apply to the weights and indicate which coins’ weights should shift and receive more weight or less weight.

#### Number of coins

The number of coins in the index is equal to 100 at all times.

#### Frequency

The index is calculated every second in real time, published with a lag equal to one second.

#### Definitions

$I^j(t)$ : At second  $j$  of Index Business Day  $t$ , Cryptoindex denominated in USD.

$I_b^j(t)$ : At second  $j$  of Index Business Day  $t$ , Cryptoindex denominated in BTC.

$P_{i,e}^j$ : At second  $j$  of Index Business Day  $t$ , price of coin  $i$  listed on exchange  $e$  in BTC (Note: the majority of the coins is traded only against BTC on the exchanges. Naturally, the price of BTC in BTC is equal to 1 at all times).

$P_{BTC,e}^j$ : At second  $j$  of Index Business Day  $t$ , price of BTC in USD listed



At second  $j$  of Index Business Day  $t$ , Cryptoindex denominated in USD.

$\omega_i^j(t)$ : On each Index Business Day  $t$ , weight of coin  $i$  (Note: superscript  $j$  is omitted, as notional remains the same throughout Index Business Day).

$N_i^j(t)$ : On each Index Business Day  $t$ , notional amount of coin  $i$  (Note: superscript  $j$  is omitted, as notional remains the same throughout Index Business Day).

$V_{i,e}^h(t)$ : At hour  $h$  of the Index Business Day  $t$ , cumulative traded volume of coin  $i$  within the hour  $h$ , listed on exchange  $e$ . Will be described below in detail.

$V_{i,e}(t)$ : At second  $j$  of the Index Business Day  $t$ , normalized traded volume of coin  $i$ , listed on exchange  $e$ . Will be described below in detail.

$C_i(t)$ : On Index Business Day  $t$ , capitalization of coin  $i$ . The capitalization information is the courtesy of Coinmarketcap. The data for the previous day always becomes available between 1 and 3 hours after the end of the previous day (between 01:00:00 UTC and 03:00:00 UTC).

**Here  $j$  equals seconds in the day, thus  $0 \leq j < 86400$ , where  $j = 0$  represents UTC 00:00:00 and  $j = 86399$  represents UTC 23:59:59.**

An incremental value of one represents one more second. Note that a negative value of  $j$  corresponds to the previous Index Business Day, whereas a value of  $j$  greater than or equal to 86400 corresponds to seconds of the following Index Business Day.

For example:

$$I^{-1}(t) = I^{86399}(t-1); I^{86401}(t) = I^1(t+1)$$

$T_k$ : Rebalance day where  $T_0$  represents rebalance inception day. In the current set up as rebalance occurs at each month's end,  $T_k$  is equivalent to the last index business day.

**m: Eligible exchange takes values from 1 to M.** In the current version,  $m$  has a maximum value of 9, so  $M=9$  and  $m=1$ : Binance,  $m=2$ : Bitfinex, ...,  $m=9$ : Poloniex.



$m$ : Eligible exchange takes values from 1 to  $M$ . In the current version,  $m$  has a maximum value of 9, so  $M=9$  and  $m=1$ : Binance,  $m=2$ : Bitfinex, ...,  $m=9$ : Poloniex.

### Initial weights calculations

For each Index Business Day  $t$ , the weights are calculated on the last available rebalance day,  $T_k$ , such that  $T_{k-1} \leq t < T_k$ . Weight is calculated as the percentage of average capitalization of coin  $i$  divided by the total average capitalization across all 100 coins and within the calendar month ( $L$ =number of days in the calendar month excluding the last day and  $d$  denotes the index running over the days) on rebalance day, i.e.

$$C_{Total} = \sum_{i=1}^{100} \left( \frac{1}{L} \left( \sum_{d=1}^L C_i(d) \right) \right)$$

$$\omega_i = \left( \frac{1}{L} \left( \sum_{d=1}^L C_i(d) \right) \right) / C_{Total}$$

$$\text{such that } \sum_{i=1}^{100} \omega_i = 1.$$

The new weights are calculated as soon as the capitalization data is available at UTC 03:00:00.

Second  $j=84600$  corresponds to UTC 23:30:00, when rebalance occurs thirty minutes prior to the end of the Index Business Day.



Although the index with the weights of the previous period is still relevant, the new index is being constantly recalculated, as if we were to sell the previous period's index  $I^j(t)$  (or  $I_b^j(t)$ , in BTC) and purchase the new index with the new weights. Each second, as the prices of the coins update, the amounts of coins change. Here  $N_i(T_k, j)$  refers to the number of coins we would hypothetically have at second  $j$  within day  $T_k$ .

$$N_i(T_k) = [I_b^{86400}(T_k) \cdot \omega_i(t)] / (P_i^{86400}(T_k))$$

The continuous recalculation is done in order to provide absolutely seamless merging of the indices of the previous and the new periods.

**In essence there are two indices being calculated in parallel between UTC 23:30:00 and UTC 23:59:59**, one consisting of the weights of the previous period and one consisting of the newly calculated weights. Up until UTC 23:59:59 the previous index is relevant and at UTC 00:00:00 the new index becomes relevant with the amounts of coins:

$$N_i(T_k) = [I_b^{86400}(T_k) \cdot \omega_i(t)] / (P_i^{86400}(T_k))$$



## Price

For each day  $t$ , the price of coin  $i$  in BTC, at second  $j$  is calculated as the weighted average of prices across all exchanges  $e$ , weighted by normalized traded volume\*\*\* of the relevant exchange (volume-based weights are assigned to each exchange).

$$P_i^j(t) = \left[ \sum_{e=1}^M P_{i,e}^j(t) \cdot V_{i,e}(t,j) \right] / \sum_{e=1}^M V_{i,e}(t,j)$$

Then the index price in BTC is given by:

$$N_i(T_k) = [I_b^{86400}(T_k) \cdot \omega_i(t)] / (P_i^{86400}(T_k))$$

where the price of BTC in BTC is equal to 1 at all times.

After that, we use the value of the index in BTC to get the value of the index in USD:

$$I^j(t) = I_b^j(t) \cdot P_{BTC,e}^j$$

\*\*\*normalized traded volume refers to the smoothing methodology we apply for calculating the volume-based weights for the exchanges.

## Normalized traded volume calculation

In order to assign volume-based weights to the exchanges, we collect the trades that happened in the last 12 hours excluding the current hour and the previous hour. For example, if the calculation is being done at 12:48:30 UTC, we exclude the hour between 12:00:00 UTC and 12:59:59 UTC, and we exclude the hour between 11:00:00 UTC and 11:59:59 UTC. The period we look at is between



The period we look at is between 23:00:00 UTC of the previous day and 10:59:59 UTC current day. Thus, the volume-based weights are calculated on an hourly basis.

**The motivation for this exclusion is that when trades arrive late from the exchanges, the volume-based weight is constantly updated and does not allow to have fixed weights.**

$V_{i,e}^h(t)$  is calculated for  $h$  between 0 and 11. In the above example:

$V_{i,e}^0(t)$  refers to the hour between 23:00:00 UTC and 23:59:59 UTC,

$V_{i,e}^1(t)$  (t) between 00:00:00 UTC and 00:59:59 UTC, and so on.  $K$  is

the number of trades in a particular hour.  $V_{i,e,k}(j)$  is trade number  $k$  at second  $j$ , where  $j$  is within hour 0 (in our example, between 23:00:00 UTC and 23:59:59 UTC).

$$V_{i,e}^0(t) = \sum_{k=1}^K V_{i,e,k}(j) \text{ for } j \in \text{day } 0.$$

$V_{i,e}(t,j)$  refers to the exponentially smoothed volumes calculated from the previous 12 hours (as described above) which is used for calculations at second  $j$  for coin  $i$  on exchange  $e$  (if two seconds lay within the same hour, the value of  $V_{i,e}(t,j)$  is the same for them). It is calculated as follows:

$$V_{i,e}(t,j) = \frac{\sum_{h=0}^{11} V_{i,e}^h(t) \cdot e^{-\alpha h}}{\sum_{h=0}^{11} e^{-\alpha h}}$$

where  $\alpha$  is the coefficient inside the exponent giving more or less weight to the hour that is closest to the current moment in time, and the value is normalized. This exponentially weighted volume is the volume-based weight used in calculating the weighted average price for each coin.



## Indexing Module

As an example, let's take a look at the process of forming the index structure out of 5 coins with an initial price of the index structure equal to 0.48 BTC.

1. ADA max. 100 000%		40.5	bittrex, hitbtc, huobi	0.19599611 BTC
2. DASH max. 59 500%		40.828	bittrex, hitbtc, huobi	0.19758343 BTC
3. LSK max. 18 672%		5.788	bittrex, hitbtc, huobi	0.02801051 BTC
4. QTUM max. 12 884%		9.212	bitfinex, bittrex, hitbtc, huobi	0.04458064 BTC
5. XRP max. 3 672%		3.672	bitfinex, bittrex, hitbtc, huobi	0.01777031 BTC

1. ADA max. 100 000%		40.5	bittrex, hitbtc, huobi	0.19599611 BTC
2. DASH max. 59 500%		8.4	bitfinex, bittrex, hitbtc, huobi	0.04065104 BTC
3. LSK max. 51 100%		30.405	bittrex, hitbtc, huobi	0.14714226 BTC
4. QTUM max. 20 695%		5.898	bitfinex, bittrex, hitbtc, huobi	0.02854284 BTC
5. XRP max. 14 797%		14.797	bitfinex, bittrex, hitbtc, huobi	0.07160875BTC

**As we can see, there are many ways to choose the shares of BTC that can be distributed between the five coins.** The Neural Networks' output allows to select not only the best coins in the rating, but also adjust their cap-weighted shares according to their rating. With Zorax, this process is done fully automatically and independently.



# Test Purchase Module

This allows us to test-trade a coin on multiple exchanges simultaneously, determining with a high degree of certainty its actual liquidity. For each exchange, we are able to use several test accounts to gather a wider scope of valuable information.

Test trades are initiated and executed by our trade robots. These robots also store test trade statistics for further analysis. Through looking at general trade statistics and order

books, the liquidity of each coin gets additionally assessed across different day times and intervals.

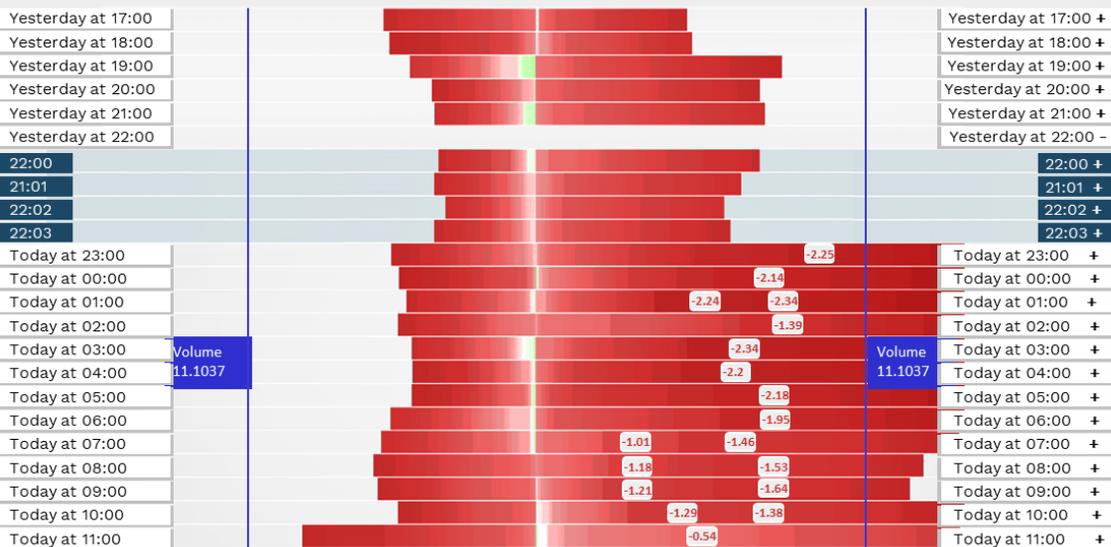
Once relative liquidity levels of each exchange are established with required certainty, we would spread the test trade order between the exchanges, in accordance with their liquidity profile. The test trade report shows the relative distribution of the trade between each exchange. This may happen several times, until an optimal trade distribution is achieved.

**Test purchase module is currently integrated with the following exchanges:**

- OKex
- Binance
- Huobi
- Bitfinex
- Bittrex
- HitBTC
- Bitstamp
- Poloniex
- Kraken

Buy on binance < Sell on bitfinex

Sell on bitfinex > Buy on binance



## Available accounts

This accounts can be used for executing this purchase strategy

### Test

<input checked="" type="checkbox"/> <b>hitbtc</b> (hitbtc_test)	max 0.104523 BTC		0.060623
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### Zorax

<input checked="" type="checkbox"/> <b>bitfinex</b> (bitfinex_zorax)	max 0.104523 BTC		0.18785
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<input checked="" type="checkbox"/> <b>bittrex</b> (bittrex_zorax)	max 0.104523 BTC		0.216787
--	------------------	--	----------

<input checked="" type="checkbox"/> <b>hitbtc</b> (hitbtc_zorax)	max 0.104523 BTC		0.384033
--	------------------	--	----------

<input checked="" type="checkbox"/> <b>huobi</b> (huobi_zorax)	max 0.104523 BTC		0.403871
--	------------------	--	----------

**Total** **1.25316400 BTC**

## Buy strategy preview

Currencies distribution over accounts

	bitfinex_zorax	bittrex_zorax	hitbtc_test	hitbtc_zorax	hitbtc_zorax
<b>1.ABY</b> Allocated, <b>BTC</b>		0.313291			
Estimate spent, <b>BTC</b>		0.313291			
Estimate amount, <b>ABY</b>		751297.36211031			
	(bitfinex_zorax)	(bittrex_zorax)	(hitbtc_test)	(hitbtc_zorax)	(hitbtc_zorax)
<b>2.AE</b> Allocated, <b>BTC</b>			0.055741	0.353104	
Estimate spent, <b>BTC</b>			0.055741	0.353104	
Estimate amount, <b>AE</b>			361.952	2292.884	
	(bitfinex_zorax)	(bittrex_zorax)	(hitbtc_test)	(hitbtc_zorax)	(hitbtc_zorax)
<b>3.ADA</b> Allocated, <b>BTC</b>			0.00618980	0.03921430	
Estimate spent, <b>BTC</b>			0.00706500	0.03956400	
Estimate amount, <b>ADY</b>			500	2800	27461.85
	(bitfinex_zorax)	(bittrex_zorax)	(hitbtc_test)	(hitbtc_zorax)	(hitbtc_zorax)
<b>4.DBC</b> Allocated, <b>BTC</b>					
Estimate spent, <b>BTC</b>					
Estimate amount, <b>DBC</b>					48568.66
	(bitfinex_zorax)	(bittrex_zorax)	(hitbtc_test)	(hitbtc_zorax)	(hitbtc_zorax)





Once this calibration phase is over, we conduct a test purchase of each of the 100 index coins on 9 exchanges in total. We purchase the minimal possible amount of each coin, using our 'pocket money'. Some coins are only traded on one or two exchanges, so in these cases, the geography of their test purchase is limited.

## binance\_zorax account status

70/70 orders processed

#	Pair	buy	Updated	Estimate	Actual	Allocated	Estimate	Actual	Status
1	ADA/BTC	buy	2018-06-19 19:50	+1973 ADA	+1973 ADA	-0.04849492 BTC	-0.04849637 BTC		Processed
2	AE/BTC	buy	2018-06-19 19:52	+22.21 AE	+22.21 AE	-0.00861125 BTC	-0.00861489 BTC		Processed
3	AION/BTC	buy	2018-06-19 19:47	+24.18 AION	+24.18 AION	-0.00510766 BTC	-0.00510923 BTC		Processed
4	ARK/BTC	buy	2018-06-19 19:48	+17.61 ARK	+17.61 ARK	-0.00412902 BTC	-0.00413131 BTC		Processed
5	BAT/BTC	buy	2018-06-19 19:47	+99 BAT	+99 BAT	-0.00376889 BTC	-0.00376893 BTC		Processed
6	BCH/BTC	buy	2018-06-19 19:49	+0.82 BCH	+0.82 BCH	-0.10891240 BTC	-0.10893864 BTC		Processed
7	BCN/BTC	buy	2018-06-19 19:46	+24237 BCN	+24237 BCN	-0.01428069 BTC	-0.01428116 BTC		Processed
8	BNB/BTC	buy	2018-06-19 19:51	+8.15 BNB	+8.15 BNB	-0.01987606 BTC	-0.01989171 BTC		Processed
9	BNT/BTC	buy	2018-06-19 19:47	+6 BNT	+6 BNT	-0.00303555 BTC	-0.00315390 BTC		Processed
10	BTG/BTC	buy	2018-06-19 19:46	+2.73 BTG	+2.73 BTG	-0.01309717 BTC	-0.01312509 BTC		Processed
11	BTS/BTC	buy	2018-06-19 19:51	+299 BTS	+299 BTS	-0.00714563 BTC	-0.00716703 BTC		Processed
12	CMT/BTC	buy	2018-06-19 19:47	+81 CMT	+81 CMT	-0.00252306 BTC	-0.00254511 BTC		Processed
13	DASH/BTC	buy	2018-06-19 19:50	+0.357 DASH	+0.357 DASH	-0.01382335 BTC	-0.01383339 BTC		Processed
14	DGD/BTC	buy	2018-06-19 19:47	+0.308 DGD	+0.308 DGD	-0.00528599 BTC	-0.00529698 BTC		Processed
15	ELF/BTC	buy	2018-06-19 19:46	+45 ELF	+45 ELF	-0.00450817 BTC	-0.00457200 BTC		Processed

# okex\_zorax account status

13/13 orders processed

#	Pair	buy	Updated	Estimate	Actual	Allocated	Estimate	Actual	Status
1	BCH/BTC	buy	2018-06-19 19:44	+0.618 BCH	+0.618 BCH	-0.08184865 BTC	-0.08193380 BTC	-0.08217871 BTC	Processed
2	DASH/BTC	buy	2018-06-19 19:44	+0.289 DASH	+0.289 DASH	-0.01115296 BTC	-0.01117515 BTC	-0.01123953 BTC	Processed
3	EOS/BTC	buy	2018-06-19 19:44	+29 EOS	+29 EOS	-0.04562748 BTC	-0.04569182 BTC	-0.04571850 BTC	Processed
4	ETC/BTC	buy	2018-06-19 19:44	+4.86 ETC	+4.86 ETC	-0.01104178 BTC	-0.01104445 BTC	-0.01106855 BTC	Processed
5	ETH/BTC	buy	2018-06-19 19:44	+2.92 ETH	+2.92 ETH	-0.23138387 BTC	-0.23142031 BTC	-0.23144259 BTC	Processed
6	LTC/BTC	buy	2018-06-19 19:44	+1.864 LTC	+1.864 LTC	-0.02711305 BTC	-0.02712375 BTC	-0.02713977 BTC	Processed
7	MIOTA/BTC	buy	2018-06-19 19:44	+122 MIOTA	+122 MIOTA	-0.02130725 BTC	-0.02136464 BTC	-0.02149518 BTC	Processed
8	NEO/BTC	buy	2018-06-19 19:45	+2.5 NEO	+2.5 NEO	-0.01474113 BTC	-0.01474408 BTC	-0.01480638 BTC	Processed
9	TRX/BTC	buy	2018-06-19 19:45	+2377 TRX	+2377 TRX	-0.01701323 BTC	-0.01701932 BTC	-0.01709063 BTC	Processed
10	XEM/BTC	buy	2018-06-19 19:45	+375 XEM	+375 XEM	-0.01105625 BTC	-0.01108125 BTC	-0.01113375 BTC	Processed
11	XLM/BTC	buy	2018-06-19 19:44	+703 XLM	+703 XLM	-0.02454233 BTC	-0.02455579 BTC	-0.02461906 BTC	Processed
12	XMR/BTC	buy	2018-06-19 19:44	+0.67 XMR	+0.67 XMR	-0.01240347 BTC	-0.01241455 BTC	-0.01252383 BTC	Processed
13	XRP/BTC	buy	2018-06-19 19:44	+1195 XRP	+1195 XRP	-0.09677982 BTC	-0.09681890 BTC	-0.09693840 BTC	Processed

It normally takes about 5 minutes to fill the test orders for the 100 coins across 8 exchanges; 90% of these test trades are executed during the first minute. We could test-trade even faster, but there are significant risks of getting banned by the exchange for

high-frequency trading. Each test trade is then logged in our database to be used for subsequent analysis.

This module is invaluable for perfecting the Cryptindex 100 because it allows us to take into account actual coin liquidity and market depth, possible slippage, real-life commissions and overall ability to execute trades in a given coin, allowing our index to be as close to the 'ground truth' as is practically possible.

## ORDER

huobi\_zorax / BFT-BTC

### Order summary

Order ID	6168388229
Date	2018-06-19 19:44:19
Pair	BFT-BTC
Type	LIMIT
buy	BUY
Processed	FILLED
Amount	92.23
Filled	92.23
Avg price	0.00002183





## What is Rebalancing?

Rebalancing consists of a number of steps. The first step is to calculate the price of the index with the current weights, or shares, at the moment of rebalancing. The next step is to receive the rating of coins from the Neural Network, calculate the new weights, and to distribute the index structure's value to each coin and get the new amounts of the coins.

It is important to note, that the rating output is always acted on by the filters, and that the initial shares are capitalization weighted. The rating allows us to adjust those weights.

In other words, the rebalancing is choosing a new set of coins for the index structure and calculating the new weights for them, in order to get the amounts of the coins for the new period. After rebalancing the index is calculated by the same rules, but using the new amounts of each coin.

## Rebalancing: an Example

The table below shows the 100 constituents of the index in March and in April. The columns are: the currency names, the currency prices at the start of the period (in the beginning of March), the share of each coin in the index structure, and the prices and shares at the end of the period. The coins highlighted in blue color are the coins that remained in the index after the rebalance, the red color indicates that the coin was excluded, and the green color indicates that the coin was included in the index.

MARCH	Start of period		End of period		APRIL	Start of period		End of period	
	Currency name	Currency price	Share in structure	Currency price		Share in structure	Currency name	Currency price	Share in structure
<b>Bitcoin</b>	\$10397.9	52.268%	\$6973.53(-32.93%)	58.469%	Bitcoin	\$6973.53	14.557%	\$9240.55(+32.51%)	10.52%
<b>Ethereum</b>	\$855.2	18.291%	\$396.46 (-53.64%)	14.143%	Ethereum	\$396.46	6.716%	\$669.92(+68.98%)	6.19%
<b>XRP</b>	\$0.90458	7.361%	\$0.51235(-43.36%)	6.954%	XRP	\$0.51235	3.507%	\$0.83794(+63.55%)	3.128%



<b>Bitcoin Cash</b>	\$1204.16	4.789%	\$685.25 (-43.09%)	4.546%	Bitcoin Cash	\$685.25	2.239%	\$1350.05 (+97.02%)	2.406%
<b>Litecoin</b>	\$202.9	1.882%	\$116.61 (-42.53%)	1.804%	Litecoin	\$116.61	1.351%	\$148.48 (+27.33%)	0.938%
<b>Cardano</b>	\$0.31258	1.785%	\$0.15592(-50.12%)	1.485%	Gas	\$15.76	0.96%	\$29.65 (+88.13%)	0.985%
<b>NEO</b>	\$133.24	1.409%	\$50.13 (-62.38%)	0.884%	Hshare	\$5.7	0.957%	\$11.04 (+93.68%)	1.011%
<b>Stellar</b>	\$0.33392	1.289%	\$0.20678(-38.07%)	1.331%	Golem	\$0.20091	0.952%	\$0.5564 (+176.94%)	1.438%
<b>EOS</b>	\$8.41	1.062%	\$5.99 (-28.78%)	1.262%	Ardor	\$0.22543	0.946%	\$0.39988 (+77.39%)	0.916%
<b>Dash</b>	\$584.29	0.825%	\$305.76 (-47.67%)	0.72%	DigiByte	\$0.01762	0.943%	\$0.04053 (+130.02%)	1.182%
<b>NEM</b>	\$0.40179	0.791%	\$0.2211 (-44.97%)	0.726%	Factom	\$19.25	0.933%	\$28.29 (+46.96%)	0.748%
<b>Monero</b>	\$285.7	0.665%	\$179.56 (-37.15%)	0.697%	NEO	\$50.13	0.932%	\$84.27 (+68.10%)	0.854%
<b>Ethereum Classic</b>	\$33.69	0.494%	\$14.37 (-57.35%)	0.352%	Ark	\$2.01	0.93%	\$3.61 (+79.60%)	0.911%
<b>TRON</b>	\$0.04335	0.467%	\$0.03397(-21.64%)	0.61%	Ox	\$0.54729	0.929%	\$1.18 (+115.61%)	1.093%
<b>VeChain</b>	\$4.54	0.445%	\$2.38 (-47.58%)	0.389%	Stellar	\$0.20678	0.923%	\$0.42466 (+105.37%)	1.034%
<b>Lisk</b>	\$18.34	0.438%	\$7.54 (-58.89%)	0.301%	EOS	\$5.99	0.913%	\$17.58 (+193.49%)	1.462%
<b>Bitcoin Gold</b>	\$113.18	0.337%	\$44.34 (-60.82%)	0.22%	Basic Attention Token	\$0.19529	0.911%	\$0.47972 (+145.65%)	1.221%
<b>Qtum</b>	\$26.22	0.33%	\$14.25 (-45.65%)	0.299%	Komodo	\$2.37	0.909%	\$3.98 (+67.93%)	0.832%
<b>ICON</b>	\$3.55	0.286%	\$2.21 (-37.75%)	0.297%	Loopring	\$0.3841	0.907%	\$0.92445 (+140.68%)	1.19%
<b>Nano</b>	\$14.29	0.24%	\$5.62 (-60.67%)	0.158%	PIVX	\$3.57	0.889%	\$5.75 (+61.06%)	0.781%
<b>OmiseGO</b>	\$18.62	0.217%	\$8.23 (-55.80%)	0.16%	Cardano	\$0.15592	0.888%	\$0.34332 (+120.19%)	1.067%
<b>Zcash</b>	\$382.03	0.216%	\$185.53 (-51.44%)	0.175%	Syscoin	\$0.27511	0.881%	\$0.52835 (+92.05%)	0.923%
<b>Populous</b>	\$17.95	0.215%	\$12.22 (-31.92%)	0.244%	FunFair	\$0.03085	0.871%	\$0.04806 (+55.81%)	0.74%
<b>Binance Coin</b>	\$10.44	0.153%	\$11.06 (+5.94%)	0.271%	Augur	\$26.05	0.859%	\$40.22 (+54.40%)	0.724%
<b>Steem</b>	\$3.28	0.147%	\$1.52 (-53.66%)	0.113%	Waltonchain	\$10.2	0.853%	\$15.47 (+51.67%)	0.706%
<b>Bytecoin</b>	\$0.00448	0.128%	\$0.00212(-52.68%)	0.101%	SALT	\$2.05	0.842%	\$4.02 (+96.10%)	0.901%
<b>Verge</b>	\$0.05355	0.12%	\$0.03898(-27.21%)	0.146%	aelf	\$0.5256	0.836%	\$1.9 (+261.49%)	1.649%
<b>Siacoin</b>	\$0.01928	0.114%	\$0.01075(-44.24%)	0.106%	Dash	\$305.76	0.833%	\$472.77 (+54.62%)	0.702%



<b>Stratis</b>	\$7.35	0.109%	\$3.71 (-49.52%)	0.092%	ReddCoin	\$0.0039	0.828%	\$0.00895 (+129.30%)	1.035%
<b>Aeternity</b>	\$2.28	0.105%	\$1.59 (-30.26%)	0.122%	Zilliqa	\$0.04599	0.818%	\$0.10087 (+119.33%)	0.979%
<b>Status</b>	\$0.16322	0.099%	\$0.08884(-45.57%)	0.09%	Monero	\$179.56	0.814%	\$242.46 (+35.03%)	0.599%
<b>Waltonchain</b>	\$18.67	0.097%	\$10.2 (-45.37%)	0.089%	ZCoin	\$29.29	0.814%	\$43.25 (+47.66%)	0.655%
<b>Maker</b>	\$1028.82	0.095%	\$517.55 (-49.69%)	0.08%	Chainlink	\$0.28017	0.81%	\$0.54469 (+94.41%)	0.859%
<b>BitShares</b>	\$0.22112	0.094%	\$0.12804(-42.10%)	0.091%	Bitcoin Gold	\$44.34	0.808%	\$73.25 (+65.20%)	0.728%
<b>Veritaseum</b>	\$214.84	0.086%	\$143.37 (-33.27%)	0.096%	Status	\$0.08884	0.798%	\$0.15808 (+77.95%)	0.774%
<b>Dogecoin</b>	\$0.00602	0.083%	\$0.00282(-53.16%)	0.065%	Bancor	\$2.26	0.797%	\$4.52 (+100.00%)	0.869%
<b>Ox</b>	\$0.91717	0.083%	\$0.54729(-40.33%)	0.082%	Revain	\$0.88461	0.797%	\$0.92547 (+4.62%)	0.455%
<b>DigixDAO</b>	\$555.44	0.082%	\$245.26 (-55.84%)	0.06%	TRON	\$0.03397	0.795%	\$0.09378 (+176.04%)	1.196%
<b>Waves</b>	\$6.29	0.081%	\$3.63 (-42.29%)	0.078%	Nxt	\$0.1118	0.794%	\$0.21996 (+96.74%)	0.852%
<b>Augur</b>	\$45.85	0.076%	\$26.05 (-43.18%)	0.072%	NEM	\$0.2211	0.794%	\$0.40888 (+84.93%)	0.8%
<b>Decred</b>	\$74.41	0.073%	\$39.74 (-46.59%)	0.065%	Neblio	\$7.83	0.791%	\$15.06 (+92.34%)	0.83%
<b>Ardor</b>	\$0.38122	0.065%	\$0.22543(-40.87%)	0.064%	TenX	\$0.86165	0.789%	\$1.57 (+82.21%)	0.784%
<b>Loopring</b>	\$0.55158	0.063%	\$0.3841 (-30.36%)	0.073%	<b>Ontology</b>	\$2.06	0.78%	\$7.8 (+278.64%)	1.612%
<b>Z Classic</b>	\$30.09	0.063%	\$5.1 (-83.05%)	0.018%	Request Network	\$0.15996	0.778%	\$0.276 (+72.55%)	0.732%
<b>Hshare</b>	\$9.12	0.061%	\$5.7 (-37.50%)	0.063%	Kyber Network	\$0.99847	0.776%	\$2.64 (+164.40%)	1.12%
<b>Komodo</b>	\$3.65	0.06%	\$2.37 (-35.07%)	0.065%	MaidSafeCoin	\$0.22944	0.774%	\$0.38053 (+65.85%)	0.7%
<b>Gas</b>	\$37.46	0.058%	\$15.76 (-57.93%)	0.04%	Power Ledger	\$0.27988	0.773%	\$0.55232 (+97.34%)	0.832%
<b>Ark</b>	\$3.6	0.056%	\$2.01 (-44.17%)	0.052%	IOST	\$0.02408	0.772%	\$0.05893 (+144.71%)	1.031%
<b>Revain</b>	\$2.29	0.056%	\$0.88461(-61.37%)	0.036%	Iconomi	\$0.74908	0.766%	\$1.57 (+109.59%)	0.875%
<b>Kyber Network</b>	\$1.73	0.054%	\$0.99847(-42.28%)	0.052%	OmiseGO	\$8.23	0.765%	\$16.95 (+105.95%)	0.859%
<b>Cryptonex</b>	\$7.22	0.051%	\$4.67 (-35.32%)	0.056%	ICON	\$2.21	0.763%	\$4.34 (+96.38%)	0.817%
<b>Byteball Bytes</b>	\$392.76	0.05%	\$168.85 (-57.01%)	0.036%	Decred	\$39.74	0.746%	\$83.5 (+110.12%)	0.855%
<b>Zilliqa</b>	\$0.04853	0.05%	\$0.04599 (-5.23%)	0.079%	<b>Storj</b>	\$0.65883	0.743%	\$1.16 (+76.07%)	0.713%
<b>Basic Attention Token</b>	\$0.34009	0.049%	\$0.19529(-42.58%)	0.047%	BitShares	\$0.12804	0.741%	\$0.35875 (+180.19%)	1.133%
<b>aelf</b>	\$1.11	0.049%	\$0.5256 (-52.65%)	0.039%	<b>Bitcoin Diamond</b>	\$2.32	0.738%	\$5.57 (+140.09%)	0.966%
<b>Bytom</b>	\$0.33831	0.047%	\$0.5297 (+56.57%)	0.124%	Dogecoin	\$0.00282	0.736%	\$0.00521 (+84.82%)	0.742%
<b>DigiByte</b>	\$0.03205	0.047%	\$0.01762(-45.02%)	0.043%	Emercoin	\$2.28	0.735%	\$3.28 (+43.86%)	0.576%

<b>Pillar</b>	\$0.75258	0.046%	\$0.33873(-54.99%)	0.034%	Siacoin	\$0.01075	0.732%	\$0.02735 (+154.36%)	1.015%
<b>Dentacoin</b>	\$0.00061	0.045%	\$0.0003 (-51.40%)	0.037%	Ethereum Classic	\$14.37	0.729%	\$21.68 (+50.87%)	0.6%
<b>Bitcore</b>	\$19.47	0.045%	\$5.62 (-71.14%)	0.022%	Gnosis	\$58.07	0.717%	\$115.76 (+99.35%)	0.779%
<b>QASH</b>	\$0.80695	0.043%	\$0.61298(-24.04%)	0.054%	Substratum	\$0.34629	0.716%	\$0.85584 (+147.15%)	0.965%
<b>PIVX</b>	\$5.38	0.042%	\$3.57 (-33.64%)	0.047%	SmartCash	\$0.07394	0.709%	\$0.14809 (+100.28%)	0.775%
<b>GXChain</b>	\$3.99	0.042%	\$2.7 (-32.33%)	0.048%	Aion	\$2.01	0.709%	\$3.7 (+84.08%)	0.712%
<b>Nebulas</b>	\$8.16	0.04%	\$5.11 (-37.38%)	0.042%	Vertcoin	\$1.65	0.699%	\$2.67 (+61.82%)	0.617%
<b>Cindicator</b>	\$0.12107	0.039%	\$0.06256(-48.32%)	0.034%	VeChain	\$2.38	0.697%	\$4.49 (+88.66%)	0.718%
<b>Syscoin</b>	\$0.61999	0.037%	\$0.27511(-55.63%)	0.027%	Byteball Bytes	\$168.85	0.697%	\$265.33 (+57.14%)	0.597%
<b>IOST</b>	\$0.03356	0.037%	\$0.02408(-28.25%)	0.044%	Enjin Coin	\$0.10071	0.688%	\$0.16102 (+59.89%)	0.6%
<b>Golem</b>	\$0.3638	0.036%	\$0.20091(-44.78%)	0.033%	Zcash	\$185.53	0.682%	\$285.14 (+53.69%)	0.572%
<b>Dent</b>	\$0.02416	0.036%	\$0.00951(-60.61%)	0.024%	Waves	\$3.63	0.681%	\$6.71 (+84.85%)	0.686%
<b>Aion</b>	\$2.77	0.034%	\$2.01 (-27.44%)	0.042%	Cindicator	\$0.06256	0.681%	\$0.11108 (+77.55%)	0.659%
<b>SmartCash</b>	\$0.1997	0.034%	\$0.07394(-62.97%)	0.021%	Dent	\$0.00951	0.677%	\$0.01064 (+11.87%)	0.413%
<b>FunFair</b>	\$0.05156	0.031%	\$0.03085(-40.17%)	0.031%	GameCredits	\$1.08	0.676%	\$1.84 (+70.37%)	0.629%
<b>MonaCoin</b>	\$5.43	0.031%	\$3.13 (-42.36%)	0.03%	Civic	\$0.20504	0.676%	\$0.41062 (+100.27%)	0.738%
<b>Power Ledger</b>	\$0.56288	0.029%	\$0.27988(-50.28%)	0.024%	Stratis	\$3.71	0.675%	\$6.77 (+82.48%)	0.672%
<b>Factom</b>	\$31.44	0.028%	\$19.25 (-38.77%)	0.029%	Lisk	\$7.54	0.675%	\$13.16 (+74.54%)	0.642%
<b>Particl</b>	\$20.57	0.028%	\$9.76 (-52.55%)	0.022%	Quantstamp	\$0.10249	0.673%	\$0.21045 (+105.34%)	0.754%
<b>ZCoin</b>	\$51.29	0.027%	\$29.29 (-42.89%)	0.026%	GXChain	\$2.7	0.671%	\$4.08 (+51.11%)	0.553%
<b>ReddCoin</b>	\$0.00825	0.026%	\$0.0039 (-52.69%)	0.021%	Qtum	\$14.25	0.67%	\$22.64 (+58.88%)	0.58%
<b>SALT</b>	\$3.9	0.024%	\$2.05 (-47.44%)	0.021%	Raiden Network Token	\$1.37	0.666%	\$2.25 (+64.23%)	0.596%
<b>Ignis</b>	\$0.16534	0.023%	\$0.07522(-54.51%)	0.018%	Nucleus Vision	\$0.02806	0.657%	\$0.04718 (+68.15%)	0.602%
<b>Neblio</b>	\$16.05	0.023%	\$7.83 (-51.21%)	0.018%	Bytom	\$0.5297	0.657%	\$1.01 (+90.67%)	0.683%
<b>Nexus</b>	\$1.73	0.023%	\$1.46 (-15.61%)	0.032%	BitcoinDark	\$52.97	0.654%	\$86.94 (+64.13%)	0.585%
<b>Chainlink</b>	\$0.66145	0.022%	\$0.28017(-57.64%)	0.016%	Decentraland	\$0.07082	0.652%	\$0.15492 (+118.76%)	0.778%
<b>Emercoin</b>	\$3.5	0.022%	\$2.28 (-34.86%)	0.024%	MonaCoin	\$3.13	0.637%	\$5.25 (+67.73%)	0.583%
<b>Nxt</b>	\$0.18906	0.022%	\$0.1118 (-40.87%)	0.021%	Mithril	\$0.45799	0.632%	\$1.14 (+148.91%)	0.858%





MaidSafeCoin	\$0.38041	0.021%	\$0.22944(-39.69%)	0.021%	Nano	\$5.62	0.631%	\$8.41(+49.64%)	0.515%
WAX	\$0.29097	0.021%	\$0.14122(-51.47%)	0.017%	WAX	\$0.14122	0.628%	\$0.34939(+147.41%)	0.847%
Bancor	\$4.84	0.021%	\$2.26(-53.31%)	0.016%	Nexus	\$1.46	0.628%	\$2.47(+69.18%)	0.579%
Blocknet	\$34.43	0.021%	\$13.31(-61.34%)	0.014%	Achain	\$0.20872	0.627%	\$0.35319(+69.22%)	0.579%
Request Network	\$0.2775	0.021%	\$0.15996(-42.36%)	0.02%	Bytecoin	\$0.00212	0.625%	\$0.0055(+159.36%)	0.884%
Quantstamp	\$0.25174	0.019%	\$0.10249(-59.29%)	0.013%	iExec RLC	\$0.84033	0.622%	\$1.62(+92.78%)	0.654%
TenX	\$1.48	0.019%	\$0.86165(-41.78%)	0.019%	Particl	\$9.76	0.619%	\$16.7(+71.11%)	0.578%
Ionomi	\$1.38	0.018%	\$0.74908(-45.72%)	0.016%	monaco	\$4.66	0.616%	\$11.71(+151.29%)	0.844%
DigitalNote	\$0.01678	0.017%	\$0.00657(-60.86%)	0.011%	Po.et	\$0.02633	0.598%	\$0.05901(+124.13%)	0.731%
GameCredits	\$2.48	0.017%	\$1.08(-56.45%)	0.012%	Ignis	\$0.07522	0.592%	\$0.11228(+49.27%)	0.482%
Raiden Network Token	\$2.65	0.016%	\$1.37(-48.30%)	0.014%	NavCoin	\$0.86489	0.592%	\$1.44(+66.49%)	0.538%
Gnosis	\$131.7	0.016%	\$58.07(-55.91%)	0.012%	Santiment Network Token	\$0.98191	0.588%	\$1.79(+82.30%)	0.585%
Substratum	\$0.55165	0.016%	\$0.34629(-37.23%)	0.017%	Blocknet	\$13.31	0.585%	\$19.57(+47.03%)	0.469%
Po.et	\$0.05434	0.016%	\$0.02633(-51.56%)	0.013%	SIRIN LABS Token	\$0.23336	0.585%	\$0.54496(+133.53%)	0.745%
Horizen	\$37.9	0.015%	\$15.88(-58.10%)	0.011%	Horizen	\$15.88	0.582%	\$38.93(+145.15%)	0.778%
<b>TOTAL</b>		<b>100 %</b>		<b>100 %</b>	<b>TOTAL</b>		<b>100 %</b>		<b>100 %</b>

**The process of rebalancing is as follows:** At the end of the period, the weights will always have changed due to the change in cryptocurrencies' prices. The neural network gives recommendations on what the new weights should be. In this particular example of the rebalance between March and April, for instance, Bitcoin's rebalance portion equals to  $(52.268\% - 14.557\%) = 37.711\%$ .

**If we look at the structure of the index in March, we see that some of the strongest coins, Bitcoin and others in the top 10, receive less weight after the rebalance.** One of the factors serving as input into the neural network is the dynamics of the entire market. As the neural networks learn to adjust the weights of the coins in the history of the crypto market, they output slightly different weights in the future (BTC has 52.268% at the end of March and 14.557% in the beginning of April, ETH has 18.291% at the end of March and 6.716% in the beginning of April). Individual coins may not follow this depending on other factors. In this case, the neural network



makes a shift to altcoins, because the top coins, when the market starts to look healthier, do not grow as much in the capitalization as the coins initially lower in their capitalization. This is an example of how the neural network may react to the changes in a certain factor, because the neural network takes into account all the factors and learns to understand which factors are more important, and which are less significant.

**Some of the smaller coins have had a significant increase in their weights, because the market has shown signs of recovery from previous negative dynamics during March or longer. For example, Zcoin receives 0.814% instead of 0.027%, more than twenty times more.**

**It is worth noting that in March - 12 coins have weight 0.5% or above, and in April - all 100 coins have weight 0.5% or above.** Normally a coin is excluded if it had the lowest possible weight initially, and has the weight reduced if it had a higher weight before.

**Coins that have very small weights initially are likely candidates for exclusion,** for example, if they have shown very low trading volumes, very high volatility and moderate returns at the same time, they may be excluded.

**After this period sixteen coins were excluded, and in April sixteen other coins were included.**

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**Excluded:** Populous, Binance coin, Steem, Verge, Aeternity, Maker, Veritaseum, DigixDAO, ZClassic, Cryptonex, Pillar, Dentacoin, Bitcore, QASH, Nebulas, DigitalNote

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**Included:** Ontology, Storj, Bitcoin diamond, Vertcoin, Enjin coin, Civic, Nucleus vision, BitcoinDark, Decentraland, Mithril, Achain, iExec RLC, Monaco, NavCoin, Santiment network token, SIRIN LABS token.

**Most of the excluded coins did not enter the index mainly due to very low trading volumes in March and stable price downtrend.** Some of the included coins, on the other hand, showed a surge in trading volumes, and a much higher volatility, which, along with other factors, served in favor of its inclusion into the index. For example, Veritaseum sentiment factors have played a decisive role against the token.





# Appendix 1 - The Token Sale

## Token Description

- ▶ **Symbol:** CIX100
- ▶ **Standard:** ERC20 cryptographic token
- ▶ **Nominal Value:** 0.0001 BTC

## Token Description

To commence your involvement with us and the Token Sale process, you should sign up on the Website. Once you have created an account with us and provided all initially required information, you will be in a position to receive the Token Sale participation link. Please note that in order to follow the Token Sale participation link, you will need to have accepted, among other, all of our required terms and conditions.

## Principal Features of the Tokens

Those who purchase their Tokens from us in the Token Sale will enjoy the following rights:

### 3 Months free PRO access

to the Cryptoindex Platform. This right will be granted to each Token Sale Purchaser regardless of whether such Purchaser keeps or sells his/her CIX100 Tokens after the Token Sale.

### Ability to offer their CIX100 Tokens

A stand-alone regulated fund (**“Authorised Fund”**) may, once created, be able to acquire CIX100 Tokens from eligible Token Sale Purchasers, referencing the then current Index Value of CIX100. This opportunity will only be extended to certain CIX100 Tokens acquired during the Token Sale. Subsequent holders of Tokens will not have the benefit of this opportunity. Please see **Appendix 2 (“Authorised Fund”)** for a detailed discussion of this feature and Token eligibility criteria.



## Bonus Token Allocations

A Token Sale Purchaser may be qualified to receive extra CIX100 Tokens if his purchase satisfies our Bonus Allocation Criteria. Please see “**Bonus Token Allocation**” below.

Additionally, any holders of CIX100 Tokens (whether acquired from us at the Token Sale or subsequently purchased elsewhere) will be offered a **50% discount** on the price of services on the Cryptoindex Platform when paying with CIX100 Tokens.

**All Tokens acquired by Participants during the Token Sale will be freely usable on our Platform immediately upon receipt. CIX100 Tokens will also be freely transferable immediately upon receipt.** It is proposed that, following the Token Sale, applications will be lodged for CIX100 Tokens to be admitted to trading under the ticker symbol CIX100, and it is expected that CIX100 be listed on at least one major cryptocurrency exchange.

\*The Authorised Fund referred to in this White Paper is a proposed entity that is currently being set up and is not yet fully operational as of the initial publication date of this White Paper. The opportunity to approach the Authorised Fund will be conditional on the fund's registration, terms and conditions, and position limits. The Authorised Fund will purchase CIX100 Tokens at its own discretion; no purchase will be guaranteed.

## Summary of Token Sale Terms

<b>Token Issuer</b>	<b>Cryptoindex Limited, Malta</b> 171, Old Bakery Street, Valletta VLT1455, Republic of Malta (company number C87268)
<b>Start Date</b>	17 October 2018, 10:00 (UTC+1)
<b>End Date</b>	10 March 2019 23:59 (UTC+0) (or earlier, if Hard Cap is reached)
<b>Token Delivery Date</b>	10 April 2019, 23:59 (UTC+0) (or earlier, if Company so announces). See 'Bonus Tokens' below
<b>Price of CIX100 Token</b>	0.0001 BTC
<b>Minimal Purchase Amount</b>	0.01 BTC
<b>Hard Cap</b>	U.S. \$37 000 000 (thirty seven million)
<b>Soft Cap</b>	U.S. \$3 000 000 (three million)
<b>Overdrive Option</b>	Yes - 20% over the Hard Cap See "Overdrive Option" below for details
<b>Coins Accepted</b>	Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), Bitcoin Cash (BCH), Steem (STEEM)
<b>Technical limit to the number of Tokens</b>	300 000 000 (three hundred million)
<b>Further Token issues</b>	No - all Tokens will be issued via the Token Sale
<b>Further Token Sales</b>	Tokens not sold during Token Sale will be held by Company at the reserve fund and may be sold by Company within during a year after End Date end of Token Sale (subject to applicable legal requirements)
<b>Adjustable distribution</b>	Tokens not sold/allocated within 365 calendar days from end of Token Sale will be destroyed



<b>Symbol</b>	CIX100
<b>Standard</b>	ERC20
<b>Token Distribution</b>	<p>In order to receive Tokens, a Purchaser must satisfy the following conditions within 10 calendar days from the End Date of Token Sale:</p> <ul style="list-style-type: none"> <li>▪ All KYC/AML procedures must be satisfactorily passed by the Purchaser; and</li> <li>▪ the Purchaser must provide a valid wallet address and other information required for distribution of Tokens to such Purchaser.</li> </ul> <p>The Purchasers that have satisfied these conditions within 10 calendar days from the End Date of Token Sale should normally receive their Tokens by Token Delivery Date.</p>
<b>Failure to Comply</b>	<p>If a Purchaser has satisfactorily completed all required KYC/AML checks within 10 calendar days from End Date of Token Sale, but has not yet provided a valid wallet address and other required information, the distribution of Tokens to such Purchaser may be delayed beyond the proposed Token Delivery Date.</p> <p>If a Purchaser has not satisfactorily completed all required KYC/AML checks within 10 calendar days from End Date of Token Sale, or if the checks fail for any reason, we will take steps to refund the Purchaser's contribution to his/her wallet by the 20th calendar day from the End Date of Token Sale.</p>
<b>Lock-Up</b>	<p>The Tokens allocated to our advisors and team members will come with a 1-year lock-up period. Other Tokens will generally be freely transferable immediately upon receipt. See also 'Bonus Tokens' below.</p>
<b>Bonus Tokens</b>	<p>Bonus Tokens will be delivered to Purchasers in two tranches (in 3 and 6 months following the Token Delivery Date).</p>





## Sale of Tokens

**CIX100 Tokens will be available for purchase in your Token Sale Participant personal account.** Each user will be able to see the addresses and QR codes of various cryptocurrency wallets to which they can send funds to purchase Tokens. Information on the total amount of Tokens purchased, the Token Sale schedule, Token cap and the percentage of the total amount of Tokens sold will also be available in the Token Sale participant personal account.

The allocation, sale and delivery of CIX100 Tokens to you by us will be subject to a number of conditions to be fulfilled by you, including:

- **your providing us** with an adequate level of information about yourself
- **your accepting our terms and policies** and the terms of the Token Sale and Purchase Agreement
- **a satisfactory completion of required Know- Your- Customer and Anti Money Laundering checks** that may be required by us as a matter of applicable law and our policies.

**Please note we may delay the delivery of Tokens to you until such time as all applicable procedures are completed by you to our satisfaction.** There may be other factors affecting the timely delivery of CIX100 Tokens by us to you. Please review “Risk Factors” on page 116 below for a detailed description of risks that may affect the Token Sale process.

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### Price and Payment

**Each CIX100 Token will be sold for 0.0001 BTC. Bitcoin (BTC), Litecoin (LTC), Ethereum (ETH), Bitcoin cash (BCH) and Steem (STEEM) will be accepted.**

If purchase payment is made in a cryptocurrency other than BTC, it will be converted, for calculation purposes, into BTC using the exchange rate prevailing at or around the time of conversion of such purchase payment by us.



Details of the transfer by you to us will become available in the user's transaction history in your personal account after the transaction confirmation is received. Transaction details will contain the confirmation time, amount, the number of tokens received, and the number of bonus tokens depending on the applicable bonus period.

**Tokens will be delivered to the user's specified wallet no later than the Token Delivery Date set out above.** While we will make our best effort to promptly summarize and reconcile all the necessary statistics, and perform all other tasks that will be needed for the correct token delivery to all Token Sale Purchasers, there may be a number of factors affecting the timely delivery of CIX100 Tokens by us to you.

In particular, please note that we may delay the delivery of Tokens to Purchasers pending completion of such KYC and AML checks that we may be required (or deem necessary) to carry out on Purchasers. Please refer to the terms of the Token Sale and Purchase Agreement for more details.



# Bonus Token Allocation

## Token Purchase Amount (in BTC)

Periods	Date	Time UTC	1+ BTC	0.01-1 BTC
Week 1	17.10.18	13:00	15%	10%
Week 2	24.10.18	13:00	14%	9%
Week 3	31.10.18	13:00	13%	8%
Week 4	07.11.18	13:00	12%	7%
Week 5	14.11.18	13:00	11%	6%
Week 6	21.11.18	13:00	10%	5%
Week 7	28.11.18	13:00	9%	4%
Week 8	05.12.18	13:00	8%	3%
Week 9	12.12.18	13:00	7%	2.5 %
Week 10	19.12.18	13:00	7%	2.5%
Week 11	26.12.18	13:00	7%	2.5%
Week 12	02.01.19	13:00	7%	2.5%
Week 13	09.01.19	13:00	7%	2.5%
Week 14	16.01.19	13:00	6%	2.25%
Week 15	23.01.19	13:00	5%	2%
Week 16	30.01.19	13:00	4%	1.75%
Week 17	06.02.19	13:00	3%	1.5%
Week 18	13.02.19	13:00	2.5%	1.25%
Week 19	20.02.19	13:00	2%	1%
Week 20	27.02.19	13:00	1.5%	0.75%
Week 21	06.03.19	13:00	1%	0.5%

**Bonus Tokens are CIX100 Tokens**, with the same Platform functionality as any other CIX 100 Token. Please note, however, that Bonus Tokens are not counted as Eligible Tokens (i.e. Bonus Tokens cannot be offered to the Authorised Fund). See Appendix 2 (“Authorised Fund”) for more details.

## Overdrive Option

We plan to stop the Token Sale at 23:59:59 (UTC-4) on the day when our combined proceeds, as converted into BTC at the then prevailing market rate, reach the Hard Cap amount of US \$ 37 000 000 (unless the End Date of the Token Sale occurs earlier).

Please note, however, that due to wide cryptocurrency exchange rate movements (and due to a possible high volume of last-minute Token purchases), our proceeds from the Token Sale may go over US \$ 37 000 000 on a particular day, thus creating an oversubscription situation (“Overdrive”).



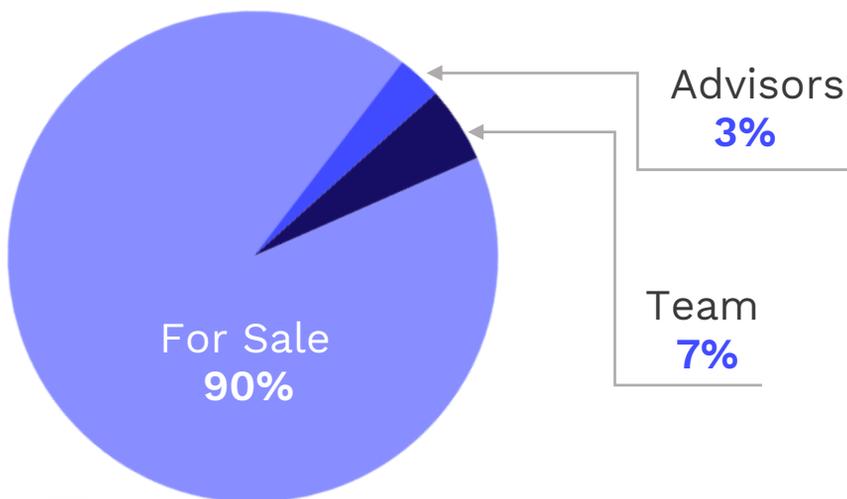
If this happens, we will stop the Token Sale on the close of business of the day when such Overdrive situation occurs. The Overdrive amounts received by us in excess of the Hard Cap amount stated above will then be allocated as follows:

- Purchases paid and completed **on or before** the Token Sale proceeds reached US\$ 44 400 000 will be honored, and Tokens will be allocated to the relevant Participants (**“Overdrive Option”**).
- Purchases paid and completed **after** the Token Sale proceeds reached US\$ 44 400 000 will be canceled, and payment for such Tokens will be refunded to the relevant Participants (even if the Token Sale proceeds decline below US\$ 44 400 000 due to subsequent exchange rate fluctuations, or due to processing of refunds).

See Terms of Refund below for a more detailed description of the refund procedure.

## Token Distribution

The proposed distribution of the total released number of CIX100 Tokens is as follows:



**90%** of Tokens will be allocated to the Purchasers in the Token Sale

**10%** of Tokens (“Incentive Tokens”) will be distributed as follows:

**7%** to our team members

**3%** to our advisors

The Incentive Tokens can be sold or exchanged by their owners only in the free market. The Authorised Fund will not accept these Tokens from their owners in its proposed acquisition program.

## Terms of Refund

A few scenarios exist where your contribution in the Token Sale may need to be refunded to you:

- In the event the Token Sale fails to reach the 'soft cap' threshold set out in the White Paper (US\$ 3 000 000), the Token Sale will be deemed unwound and all proceeds will be refunded to Purchasers;
- In the event the Token Sale creates an Overdrive situation where proceeds of the Token Sale exceed US\$ 44 400 000, any purchases made in excess of that amount will be refunded to Purchasers; and
- The Company may in its sole discretion decide to cancel and/or unwind any particular Token Sale, or refund the contribution of any particular Token Holder.

If the Company deems necessary, or is required, to refund your contribution, your subscription to (and your holding of) the Tokens would be cancelled and your received payment for the Tokens would be refunded to you by the Company in BTC at the price per Token set out in clause 6.2 of the Token Sale and Purchase Agreement (minus any service costs, commissions, fees, duties, taxes and other transaction expenses), or on such other terms as the Board of Directors of the Company may in its sole discretion determine.

If you paid us for the Tokens in an Acceptable Coin other than BTC, your contribution will be returned to you in BTC at the same exchange rate at which we had initially converted your Acceptable Coin contribution into BTC (as described in Clause 4.4 of the Token Sale and Purchase Agreement), minus any fees, duties, taxes and other commissions, as well as spreads, or bid/ask differences applicable to such exchange and to such refunds.

While we will strive to process your refund as expediently as possible, there may be technical delays in the process (including for various reasons



outside of our control) and you may not receive the refund immediately upon the cancellation of the Token Sale subscription.

Due to volatility of the cryptocurrency market, and the commissions and transactional costs involved, the value of the cryptocurrencies which you will have contributed as payment for the Tokens in the Token Sale may decrease by the time they are refunded to you, resulting in net financial loss for you from participation in the Token Sale. We will not be able to assume any liability for such loss (excluding instances of gross negligence and fraud on our part, which must be established under applicable law).

Please note that we may deduct commissions, fees, duties, taxes and other transaction expenses from the amounts so refunded to you.



## Appendix 2 - Authorised Fund

**The Authorised Fund referred to in this White Paper is a proposed entity that is not yet incorporated, is not yet licensed and is not yet fully operational as of the initial publication date of this White Paper.**

The opportunity to offer Tokens to the Authorised Fund would only be open to Token Sale participants, after the Authorised Fund is incorporated, licensed and fully operational and would only apply to Tokens purchased in the Token Sale, and not to any Bonus Tokens or Incentive Tokens.

The following is merely a description of the proposed acquisition program and is neither an offer to buy Tokens nor a guarantee of their future acquisition, liquidity or transferability.

All acquisition of CIX100 Tokens will be carried out at the sole discretion of the Authorised Fund.

### General

Purchasers in the Token Sale will have the opportunity to offer their CIX100 Tokens to a regulated fund, Authorised to acquire Tokens from Purchasers (**“Authorised Fund”**). Please see **“Eligibility”** below.

### Authorised Fund

It is proposed that the Authorised Fund will be a Professional Investment Fund (“PIF”) regulated by the Malta Financial Services Authority (MFSA). The fund is currently preparing its paperwork for registration and licensing; it is currently expected that it will be operational after the Token Delivery Date.

Once set up and licensed, the Authorised Fund may collect offers of Eligible Tokens from Participants (**“Acquisition Applications”**).





## Eligibility

In order to be eligible to approach the Authorised Fund with an offer of his/her CIX100 Tokens, the Participant must satisfy the following requirements:

- The Participant has lawfully obtained the CIX100 Tokens from us in the course of the Token Sale (“**Eligible Tokens**”) and such Participant is not (and has not been) in breach of any of our terms and policies, and of any terms of the Token Sale and Purchase Agreement
- The CIX100 Tokens have not been transferred out of the original distribution account (to which they were initially credited to such participant in the context of the Token Sale (“**Token Sale Account**”) to any other account of the participant or any third Party;
- The CIX100 Tokens are not under any encumbrance and are not subject to any other rights of any third parties.

Please note that only the CIX100 Tokens originally credited to such Participant in the Token Sale will be regarded as Eligible Tokens. Any Tokens subsequently acquired by Participant will not be considered Eligible Tokens, even if they are placed and kept by the Participant in the same Token Sale Account. In case the Participant transfers some but not all Eligible Tokens out of the Token Sale Account, the remaining Eligible Tokens can still be offered to the Fund.

The purchase of CIX100 will at all times be subject to the Authorised Fund’s discretion, and subject to its terms and conditions then in effect, and will also be subject to any investments guidelines, policies, and regulations that may be applicable to the Authorised Fund (including any established position limits that may be in effect from time to time, precluding the Authorised Fund from making any purchases of CIX100 Tokens from you).



## Settlement Price

It is anticipated that for any given Settlement Day, the proposed acquisition price of the Eligible Tokens (“Settlement Price”) (before commissions) will be determined and announced by the Authorised Fund on the business day immediately preceding such Settlement Day.

The Settlement Price will be determined by the directors of the Authorised Fund in their sole discretion. Unless the Fund determines otherwise, the Settlement Price would normally lay within the “high-low” price range of the Index Reference Value on or before the date of the announcement.

Note that the Settlement Price will, when and if payable, be paid net of established commissions (currently envisaged at 5% but subject to increase, among other, due to market volatility or due to a high volume of Acquisition Applications).

## Acquisition Program

The Authorised Fund would, at its discretion, conduct periodic repurchases of the CIX100 Tokens from Token holders. It is anticipated that, subject to availability of funds and other conditions, such repurchases will be conducted on a monthly basis, beginning in the first month after the Token Delivery Date, for as long as Tokens remain outstanding, and provided that the Authorised Fund has sufficient resources to acquire Tokens, and that its authorisation to so acquire Tokens has not been revoked.

## Appendix 3 – Security Safeguards Against Cyber Attack

VFAA (h)

**Since CIX100 activities are tightly linked to the global Internet, any of its failures are a risk of incorrect operation of CIX100 applications and platforms. CIX100 is released on the Ethereum blockchain basis. Any faults or malfunctioning of the Ethereum Blockchain code may cause the CIX100 network to function in an unexpected manner.**

CIX100 tokens can be stored by the buyer in his/her digital wallet, and a digital key or a combination of digital keys in is required for getting access to it. Losing these required keys will result in the loss of access to the buyer's wallet and all funds stored in this wallet. The risk of losing the key remains exclusively on its owner, CIX100 does not bear any responsibility for the loss of digital keys.

Refer to Ethereum Whitepaper for more details:

[http://blockchainlab.com/pdf/Ethereum\\_white\\_paper-a\\_next\\_generation\\_smart\\_contract\\_and\\_decentralized\\_application\\_platform-vitalik-buterin.pdf](http://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf)



## Appendix 4 – Executive Team Details



### **CEO and Director - Vj Angelo**

CEO and Director - Vj Angelo

[vj@cryptoindex.io](mailto:vj@cryptoindex.io)

C/O Ganado Advocates

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VLT1445

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### **Director - Victor Gorbunov**

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C/O Ganado Advocates

171 Old Bakery Road

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Malta



## Appendix 5 – Risk Factors

By providing any personal data to us, and by participating in the Token Sale and the ICO, and/or purchasing, holding, using and disposing of CIX100 and by using any other services and goods that are, or may in the future be, offered by us (“Services”), you expressly acknowledge and assume the following risks:

### **1. Risks Associated with the Ethereum Protocol and blockchain and cryptocurrencies in general.**

Because CIX100, and our Platform, are based on the Ethereum protocol, any malfunction, breakdown, or abandonment of the Ethereum protocol may have a material adverse effect on the Platform or CIX100. Moreover, advances in cryptography, or technical advances such as the development of quantum computing, could present risks to CIX100 and the Platform, including the utility of CIX100 for obtaining services, by rendering ineffective the cryptographic consensus mechanism that underpins the Ethereum protocol. Smart contracts concepts, the underlying software application and software platform (i.e. the Ethereum blockchain) are still in an early development stage and unproven. There is no warranty or assurance that the process for creating CIX100 will be uninterrupted or error-free and there is an inherent risk that the software could contain defects, weaknesses, vulnerabilities, viruses or bugs causing, inter alia, the complete loss of your cryptocurrency contributions and/or CIX100.

Subject to the timely satisfaction of any conditions that may be applicable to the Token Distribution by the Purchaser (including without limitation the satisfaction of all KYC/AML procedures and the provision of a valid wallet address and other information), CIX100 will be distributed to Purchaser’s registered wallet address, by the Token Delivery Date, provided the Purchaser’s contribution has been completed. Company may delay distribution of CIX100 for any reason whatsoever (including the collection, processing and completion of any KYC or AML checks on Participants and their wallet addresses, as well as in connection with any requirements of applicable law).

In the event that there is a serious and permanent malfunction, or breakdown of the Ethereum protocol, the Company directors may, at their sole discretion, elect to transfer or change protocols to ensure the



the continued operations of the Platform.

Blockchain technologies are controlled by various regulatory bodies around the world. Any cryptocurrency including CIX100 tokens can also be regulated by them, which makes it possible to restrict the use or possession of digital crypto-tools, or the purchase of crypto-tools in future. CIX100 Token is not an investment and does not involve passive income. All persons and parties involved in the purchase of CIX100 Tokens do it at their own risk.

**2. Risk of Mining Attacks.** As with other decentralized cryptographic tokens based on the Ethereum protocol, CIX100 are susceptible to attacks by miners in the course of validating CIX100 transactions on the Ethereum blockchain, including, but not limited, to double-spend attacks, majority mining power attacks, and selfish-mining attacks. Any successful attacks present a risk to the Platform and CIX100, including, but not limited to, accurate execution and recording of transactions involving CIX100.

**3. Risks of Hacking, Security Weaknesses, and Theft of CIX100.** Hackers or other malicious groups or organizations may attempt to interfere with the Website, the Platform or CIX100 in a variety of ways, including, but not limited to, malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, smurfing and spoofing. Furthermore, because the platform is based on open-source software, there is a risk that a third party or a member of our technology team may intentionally or unintentionally introduce weaknesses into the core infrastructure of the platform, which could negatively affect the Platform and CIX100, including the utility of CIX100 for obtaining our services.

Notwithstanding any security measures, there is no assurance that there will be no theft of the cryptocurrencies as a result of hacks, sophisticated cyber-attacks, distributed denials of service or errors, vulnerabilities or defects on the Token Sale websites, in the smart contract(s) on which the escrow wallet and the Token Sale relies, on the Ethereum blockchain or any other blockchain, or otherwise. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. In such event, even if the Token Sale is completed, we may not be able to receive the



cryptocurrencies raised and we may not be able to use such funds for the development of the Platform and/or for launching any future CIX100 functionality. In such case, the launch of the Platform and structuring and licensing of any future CIX100 functionality might temporarily or permanently be curtailed. As such, distributed CIX100 may hold little worth or value and this would impact their price or value.

Any third party that gains access to the your login credentials or private keys may be able to dispose of your CIX100. To minimize this risk, you should guard against unauthorized access to your electronic devices.

Any cryptocurrency is an inherently risky asset. One of the main features of cryptocurrency is the anonymity of all users and the absence of personalized accounts. Cryptocurrencies are, to a large extent, intangible digital codes for which there is no property right. In case of an erroneous or fraudulent transfer, it is usually no longer possible to return the money. All transactions are at your own risk. When performing transactions through many exchanges, the user does not in fact own the funds on his account - the assets are owned by the exchange. The platform only provides access to them at the entrance to the system. There are a lot of cases when users of crypto exchanges lost their assets due to cyber-attacks and bankruptcies of platforms. If money is stolen from a virtual wallet, the owner can neither identify the thief (because of anonymity and decentralization) nor assert his right to coins (due to the lack of a law on personal property).

**4. Risk of Privacy and Data Retention Issues.** As part of the Token Sale and the subsequent verification processes, the Company may collect personal information from Purchasers. All information collected will be used for purposes of Token Sale and community management and may be transferred to contractor, service providers and consultants worldwide as appointed by the Company. Apart from external compromises, the Company and its appointed entities may also suffer from internal security breach whereby their employees may misappropriate, misplace or lose your personal information. of Purchasers. The Company may be required to expend significant financial resources to alleviate problems caused by any breaches or losses, settle fines and resolve inquiries from regulatory or government authorities. Any information breaches or losses will also damage the Company's reputation and thereby may harm its long term prospects.



## **5. Risks of Non Permissioned, Decentralized and Autonomous Ledger.**

Our project, including the Services we provide, our Platform and the CIX 100 Network (the “Project”) is being developed in connection with various distributed ledger systems including, but not limited to, Ethereum, which are un-permissioned protocols that could be accessed and used by anyone. The utility and integrity of the Project relies on the stability, security and popularity of these decentralized ledgers. The Project is envisaged to be an open, decentralized community and its composition can include users, supporters, developers, Token holders and other participants worldwide who may or may not be connected with the Company in any manner. Given the diversity of the underlying technologies, the Project is intended to be decentralized and autonomous in nature as far as its maintenance, governance and evolution are concerned.

## **6. Risks of Weaknesses or Exploitable Breakthroughs in the Field of Cryptography.**

Cryptography is evolving and there can be no guarantee of security at all times. Advancement in cryptography technologies and techniques, including, but not limited to, code cracking, the development of artificial intelligence and/or quantum computers, could be identified as risks to all cryptography-based systems, including the Platform and the Project in general. When such technologies and/or techniques are applied to the Platform and the Project in general, adverse outcomes such as theft, loss, disappearance, destruction, devaluation or other compromises result. The security of the Project, the CIX100, and your personal data or assets cannot be guaranteed as the future of cryptography or security innovations is unpredictable.

## **7. Risks Associated with Markets for Company.**

There is no prior market for CIX100, and although approval of cryptocurrency exchanges and markets to list CIX100 for trading may be sought by certain persons in future, there is no guarantee that such approval will be obtained. There is no guarantee that an active or liquid trading market for CIX100 will develop or grow, or if developed, that such development and growth will be sustained after CIX100 has been made available for trading on such exchange or market. There is also no guarantee that the market price of CIX100 will not decline below the original or issue purchase price and the purchase price may not be indicative of the



market price of CIX100 after they have been made available for trading on an exchange or market. If secondary trading of CIX100 is facilitated by third party exchanges, such exchanges may be relatively new and subject to little or no regulatory oversight, making them more susceptible to fraud or manipulation. Furthermore, to the extent that third parties do ascribe an external exchange value to CIX100 (e.g., as denominated in a digital or fiat currency), such value may be extremely volatile. Company is not responsible for the circulation and trading of CIX100 on any exchange or market. Trading of CIX100 will merely depend on the consensus on its value between the relevant market participants. No one is unconditionally obliged to purchase any CIX100 from any holder of CIX100, including you nor does anyone guarantee the liquidity or market price of CIX100 to any extent at any time.

The Company cannot ensure that there will be any demand or market for CIX100, or that the purchase price is indicative of the market price of CIX100 after they have been made available for trading on any exchange or market. Exchanges or markets may require additional due diligence on our contributors in order to list on their platforms.

**8. Risks of Potential Concentrated Ownership of CIX100.** Immediately after the completion of the Token Sale, a number of individuals may directly or indirectly hold significant portions of the total available CIX100 Tokens. These Token holders may have significant de facto influence over the Company. These significant Token holders may, acting alone or in concert, not necessarily make decisions that are in the best interests of the other Token holders or of the CIX100 community as a whole.

**9. Risks Arising from Lack of Governance Rights.** Because Company confers no governance rights of any kind with respect to the Company Platform, all decisions involving the Company's products or services within the Platform or Company itself will be made by Company at its sole discretion. These decisions could adversely affect the Platform and the value and/or utility of CIX100 you own, including their utility for obtaining any Services.



**10. Risks of Uncertain Liquidity of CIX100.** The Company is not responsible for and has limited control over the subsequent circulation and trading of CIX100. CIX100 is not money, legal tender or currency, fiat or otherwise, issued by any individual, entity, central bank or national, supranational or quasi-national organization, nor is it backed by any type or quantity of assets, property, or any cryptocurrencies included in the CIX 100 index, nor does it represent any entitlement to any distributions of profits, dividends, or any other returns or payments of any kind. There is no obligation of the Company nor anyone else to redeem, repurchase or acquire any CIX100 Tokens from any Holder. There is no guarantee or assurance that there will be a market or marketplace where Holders may readily trade CIX100 Tokens.

**11. Risk of fluctuating trading price of CIX100 and cryptocurrencies in general.** All cryptographic tokens and cryptocurrencies are subject to volatile pricing and pricing can fluctuate rapidly and significantly over short periods of time.

The demand for, and the corresponding market price of, CIX100 and other cryptocurrencies may fluctuate significantly and rapidly in response to, among other, the following factors, many of which are beyond the control of Company:

- a. New technical innovations;
- b. Analysts' speculations, recommendations, perceptions, or estimates of CIX100 market price or Company's financial and business performance;
- c. Changes in market valuations and cryptographic token prices of entities with businesses similar to that of Company that may be listed on the same cryptocurrency exchanges or markets as CIX100.
- d. Announcements by Company of significant events, for example, partnerships, sponsorships, or new product developments;
- e. Fluctuations or departures of key personnel of the Company;
- f. Success or failure of Company's management in implementing business and growth strategies;
- g. Any legislative or regulatory action which may adversely affect the Company, the Company Platform, the Services or the Project;
- h. Negative press or publications about the Company or any related parties, about the Company Platform, or about our services, and



i. Changes in conditions affecting the blockchain or financial technology industry, the general economic conditions or market sentiments, or other events or factors.

Generally, speaking, high volatility of the exchange rate is a very characteristic feature of any cryptocurrency. Even within one day, fluctuations in the rates of individual cryptocurrencies can range from -50% to +50%.

Formation of the cryptocurrency exchange rates occurs in a very specific way. Unlike money that is issued by national banks, electronic money is subject to change in the exchange rate over a short period of time. Due to the decentralization of the cryptocurrency market and the absence of a governing body, no one can maintain the minimum value of a digital currency. In this case, large holders of cryptocurrencies can influence the market, creating an opportunity for panic and collapse.

**12. Risk of Failure of Project.** There is no reasonable expectation of profits based on your purchase of CIX100, and there is no guarantee that you may benefit from the Platform, the Services and the Project in any particular way.

While the Company adopts quality assurance procedures to help ensure the source codes reflect as accurately as possible their intended operation, the flawlessness of the source codes cannot be guaranteed. They may contain bugs, defects, inconsistencies, flaws or errors, which may disable some functionality, create vulnerabilities or cause instability. Such flaws may compromise the predictability, usability, stability, and/or security of the CIX 100, the Platform and the Project in general. Open source codes rely on transparency to promote community-sourced identification and solution of problems within the code.

Due to the technically complex nature of the Project, the Company or those contributing to Company's software development effort could face difficulties from time to time that may be unforeseeable and/or unresolvable. Accordingly, the development of the Project could fail, terminate or be delayed at any time for any reason, including due to lack of funds. Development failure or termination may render the CIX100 non-transferable, of reduced or no utility or value, and/or obsolete.



**13. Risk of Competition.** In addition, there is fierce competition in the cryptocurrency market and our competitors may offer products and services that may be superior to ours, and/or more aggressively marketed or more modestly priced than our Product and Services, which may negatively affect the value of our Product and Services and the value of CIX100.

It is also possible that alternative platforms could be established that utilize the same open source code and protocol underlying the Platform and attempt to facilitate services that are materially similar to the Project or any parts thereof.

**14. Risk of Uninsured Losses.** Unlike bank accounts or accounts at some other financial institutions, Company accounts are uninsured unless you specifically obtain private insurance to insure them. Thus, in the event of loss or loss of utility value, there is no public insurer or private insurance arranged by Company to offer recourse to you.

**15. Risks Associated with Uncertain Regulations and Further Enforcement Actions.** The regulatory status of digital tokens and the distributed ledger technology in general is unclear or unsettled in many jurisdictions. Cross-border data exchange does not directly link wallets and transactions with them to a single jurisdiction. Moreover, each state has its own traditions in the legal regulation of information technologies, international regulation in this area is minimal. Many experts believe that due to the high volatility of cryptocurrency, legal problems and some high-profile fraudulent schemes, it is better to consider all cryptocurrencies as speculative instruments, since the level of investment security is extremely low, and the risks are too high.

The governments of many large countries are already discussing the legal basis for regulating the industry in order to make it more transparent and safe for investors, which means that the cryptocurrencies have prospects for further development. However, it is also necessary to take into account the fact that national regulators can, at any moment introduce criminal liability for the turnover of the cryptocurrency, which means that the risks of a strong depreciation of digital assets are also high.

It is difficult to predict how or whether regulatory agencies may apply existing regulation with respect to such technology and its applications,



including the Company Platform, its user network (“Network”) and the Services we offer. It is likewise difficult to predict how or whether legislatures or regulatory agencies may implement changes to law and regulation affecting distributed ledger technology and cryptocurrencies, and its applications, including to the Company Platform and Company. Regulatory actions could negatively impact the Company in various ways, including, for purposes of illustration only, through a determination that the purchase, sale and delivery of Company constitutes unlawful activity or that Company are a regulated instrument that require registration or licensing of those instruments or some or all of the parties involved in the purchase, sale and delivery thereof.

Company may choose or be required to cease operations in a jurisdiction in the event that regulatory actions, or changes to law or regulation, make it illegal to operate in such jurisdiction, or commercially undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction. This may impact the appeal or practicality or functionality of the Project and/or the anticipated CIX100 functionality for the Purchasers and result in a decreased usage of and demand for the Project and CIX100. Further, should the costs (financial or otherwise) of complying with such newly implemented regulations exceed a certain threshold, maintaining the Company Platform and/or developing, structuring, licensing and/or launching the future of CIX100 functionality may no longer be commercially viable, and Company may opt to discontinue the Project, the anticipated future CIX100 functionality, and/or CIX100.

Company may also have to cease operations in a jurisdiction that makes it illegal to operate in such jurisdiction, or make it commercially unviable or undesirable to obtain the necessary regulatory approval (s) to operate in such jurisdiction. In scenarios such as the foregoing, the utility, liquidity, and/or trading price of CIX100 will be adversely affected and/or CIX100 may cease to be traded. The value of CIX100 may also have to be refunded to our affected participants.

Crypto-tokens have been the subject of scrutiny by various regulatory authorities and may be overseen by the legal and regulatory authorities of a number of jurisdictions globally. The functioning of the Network



and the Project generally could be impacted by one or more regulatory inquiries or actions, including, but not limited to, restrictions on the use or possession of digital tokens like CIX100, which could impede or limit the development of the Project.

The Company may receive notices, queries, warnings, requests or rulings from one or more authorities upon short notice, or may even be ordered to suspend or terminate any action in connection with the Token Sale or the Network as a whole without prior notice.

Furthermore, many aspects of the Project and the Network also involve untested areas of law and regulation, and could be subject to new laws or regulations, so their legal and regulatory outcome in all relevant jurisdictions is not possible to predict. The planning, development, marketing, promotion, execution or otherwise of the Company or the Token Sale may be seriously affected, hindered, postponed or terminated as a result. Since regulatory policies can change with or without prior notice, any existing regulatory permissions for or tolerance of the Company, the Project and the Token Sale in any jurisdiction may be withdrawn without warning. The Tokens could be deemed from time to time as a virtual commodity, a digital asset or even as money, securities or currency in various jurisdictions and therefore could be prohibited from being sold, purchased, traded, distributed or held in certain jurisdictions pursuant to local regulations. In turn, the Platform or the Network could be deemed to be a regulated or restricted product. There is no guarantee that the Company can maintain any particular legal or regulatory status in any particular jurisdiction at any time.

Since the cryptocurrency market, the market of crypto-tools, tokens or bonuses, exchanges and platforms on which secondary tokens can be traded are not always regulated by applicable law, the volatility of the cryptocurrency, tools, bonuses or tokens in general and CIX100, in particular, can be very significant. Transactions with cryptocurrencies, transactions with bonuses, tokens and other electronic instruments are not insured by any external public or private bodies. All the risks associated with the loss of cryptocurrency, tokens, points, including CIX100 Tokens, are borne by the acquirer of the cryptocurrency. CIX100 is generally not refundable. The Company does not repurchase CIX100



tokens from CIX100 holders. Holders of CIX100 Tokens will not receive financial means or other compensation for from the Company for their Tokens. The Company makes no promises regarding the future performance or value of CIX100 Tokens.

The regulatory landscape with respect to cryptocurrencies and cryptographic tokens, including CIX 100, is fast evolving. There may be uncertainty in the regulatory treatment of CIX 100 and this offer, purchase and sale of tokens in the jurisdictions where it is conducted. Although we do not believe that CIX 100 are securities in any jurisdiction where the CIX token offering is conducted, there is no assurance that relevant competent government or regulatory authorities would take a similar view, either now or in the future. Similarly, although the Company does not believe that the offer, purchase and sale of CIX 100 is subject to any securities, commodities, derivatives or other financial law and regulation, there is no assurance that any competent regulatory and governmental authorities in your jurisdiction would not subsequently take the view that CIX 100 or this offer, purchase and sale of CIX 100 be subject to specific regulation and is or was not in compliance with certain exiting regulations, including without limitation financial services based regulation. Any such different view or determination by a relevant regulatory or governmental authority may adversely affect the legality of CIX 100 and this token offering, or may otherwise impose restrictions on the future transfer of CIX 100 which may affect the market value and liquidity thereof.

Legislative and regulatory changes or actions in your local jurisdiction or at the international level may adversely affect the use, transfer, exchange and value of CIX 100. You acknowledge there may be risks associated with CIX 100 and/or the Index not being regulated in the jurisdictions in which CIX 100 may be purchased, including the risks of retroactive regulatory applicability. None of the Company, its founders, advisors or affiliates is a financial institution or is currently under supervision of any financial supervisory authority. The Company does not provide any licensed financial services, such as investment services, fund management or investment advice.

Furthermore, the operations of the Authorised Fund are subject to the approval of an independent regulator. In the event that such licensing

approval is delayed or not obtained, this would impact the possibility of the CIX 100 holders selling their tokens to the Authorised Fund.

#### **16. Risks Relating to Use of the Internet or Other Electronic Media.**

Without limiting the foregoing risks, any communication or transaction via or information (including document) transmitted via the internet or other electronic medium involves risks and by participating in the Token sale or utilizing the Network or the Company Platform, you acknowledge that you understand and accept the following risks:

-We and/or third parties may use such authentication technologies as we deem appropriate;

-No authentication, verification or computer security technology is completely secure or safe. You agree to bear all risks of unAuthorised access/use, hacking or identity theft;

-The internet or other electronic media (including, without limitation, electronic devices, services of third party telecom service providers such as mobile phones or other handheld trading devices or interactive voice response systems) are an inherently unreliable form of communication;

-Any information (including any document) transmitted, or communication or transactions made, over the internet or through other electronic media (including electronic devices, services of third party telecom service providers such as mobile phones or other handheld trading devices, including those with interactive voice response systems) may be subject to interruption, transmission blackout, delayed transmission due to data volume, internet traffic, market volatility or incorrect data transmission (including incorrect price quotation) or stoppage of price data feed due to the public nature of the internet or other electronic media.

As a result of such unreliability, there may be time-lags, delays, failures or loss of data or loss of confidentiality in the transmission of data and receipt of communications; and while the Company may believe certain data to be reliable, there may be no independent basis for it to verify or contradict the accuracy or completeness of such data.

**17. Risks of Exposure to Cryptographic Tokens.** After the completion of the Token Sale, the Company expects that a certain portion of the proceeds will be held in cryptographic tokens. The Company may, but it





is not required to convert an appropriate proportion of cryptographic tokens received into fiat currencies at the sole discretion of the directors of the Company. For the avoidance of doubt, no Token holder has any right, title or interest in any such cryptographic tokens or such fiat currency.

**18. Risk of Malfunction in the Company Platform, the Network, and the Project in General.** It is possible that the Network and the Company Platform malfunctions in an unfavorable way, including, but not limited to, one that results in the loss of CIX100, or information concerning any particular asset market.

**19. Unanticipated Risks/Risks of other Risks.** Cryptographic tokens such as CIX100 are a new and untested technology. In addition to the risks discussed here there are other risks associated with your purchase, holding, use and disposal of CIX100, and access to and the use of Company Platform, Services and Network, including unanticipated risks. Such risks may further materialize as unanticipated variations or combinations of the risks discussed here.

**20. Forward-Looking Statements.** All statements contained in the Company documentation (whether presented on the Website, the White Paper, or in any other document or publication), statements made in any press releases (or any medium), statements made on social media platforms (including but not limited to: Telegram, Facebook, Twitter, and Discord), or statements made by any person in any place accessible by the public and oral statements that may be made by Company or Company representatives (as the case may be) that are not statements of historical fact, constitute “forward looking statements”. All statements regarding Company’s financial position, business strategies, plans and prospects and the future prospects of the industry which Company is in are forward-looking statements. These forward-looking statements, including but not limited to statements as to Company’s revenue profitability and growth, expected revenue profitability and growth, prospects, future plans, other expected industry trends and other matters discussed in the information regarding Company are matters that are not historical facts, but only estimations and predictions. These forward-looking statements involve



known and unknown risks, uncertainties and other factors that may cause the actual future results, performance or achievements of Company to be materially different from any future results, performance or achievement expected, expressed or implied by such forward-looking statements. These factors may include: a) changes in political, social, economic and stock or cryptocurrency market conditions, b) the risk that Company may be unable or execute or implement its business strategies and future plans; c) changes in interest rates and exchange rates of cryptocurrencies; d) change in anticipated growth strategies and expected internal growth of Company; e) changes in the availability and fees payable to Company in connection with its business and operations; f) changes in preferences of contributors of Company; g) Acts of God; and h) other factors beyond the exclusive control of Company.

All forward-looking statements made by or attributable to Company or Company representatives are expressly qualified in their entirety by such factors. Given that risks and uncertainties that may cause the actual future results, performance or achievements of Company to be materially different from that expected, expressed or implied by the forward-looking statements made by Company or Company representatives, undue reliance must not be placed on these statements. These forward-looking statements are applicable only as of the later of the date of publication of the White Paper and the latest date that our website has been updated.

Neither Company nor its representatives nor any other person represents, warrants and/or undertakes that the actual future results, performance or achievements of Company will be as discussed in those forward-looking statements. Nothing contained in the information provided by Company or Company representatives is or may be relied upon as a promise, representation or undertaking as to the future performance or policies of Company. Further, Company disclaims any responsibility to update any of those forward-looking statements to reflect future developments, events or circumstances, even if new information becomes available or other events occur in the future.

## Appendix 6 – Legal Opinion (Executive Summary)

GANADO Advocates, of 171, Old Bakery Street, Valletta VLT1455, Malta, acted as Maltese counsel to the Company.

- The below are two excerpts from their legal opinion dated 16 October 2018:

“Dear Sirs,

**Re: Legal Opinion in respect of the CIX 100, a token to be issued by Cryptoindex Limited, a Maltese limited liability Company having Company Registration Number C 87268 and Registered Office at 171, Old Bakery Street, Valletta VLT 1455, Malta (the “Issuer”)**

You have instructed us to prepare a legal opinion under Maltese law in relation to the CIX 100 Token (“CIX 100”) issued and to be issued, sold and/or delivered by the Issuer (the “CIX 100 Offering”).

### 1.0 EXECUTIVE SUMMARY

**1.1** Based on the current legislative framework in Malta, CIX 100 qualifies as a Virtual Financial Asset and the issue, sale and delivery of CIX 100 tokens by the Issuer does not as at the date of this opinion raise any legal, regulatory or disclosure issues and such CIX 100 or each of their issue, sale and delivery is legal and valid and is not in conflict with any law or regulation applicable in the Republic of Malta.

**1.2** The issue, sale and delivery of the CIX 100 by the Issuer to the first Purchasers (as such term is defined in terms of the Token Sale Purchase Agreement (the “TSPA”) under the TSPA are exempt, from the requirement to publish a prospectus set out in Article 89 of the Companies Act, Chapter 386 of the laws of Malta. No approval or consent of, or registration or filing with, any regulatory authority in the Republic of Malta is required to permit the issue, sale and/or delivery of CIX 100 by the Issuer to the Purchasers. Please note that the issue, sale and/or delivery of CIX 100 may still be subject to a notification requirement as set





out in point 1.5.1 of this opinion.

**1.3** We have considered whether CIX 100 is: (a) a virtual token, (b) a financial instrument, (c) electronic money, (d) a payment instrument, or (e) a virtual financial asset.

**1.4** It is our opinion that CIX 100 does not qualify as: (a) a virtual token, (b) a financial instrument, (c) electronic money, or (d) a payment instrument and will, on the basis of the current definition of a ‘virtual financial asset’ in the Virtual Financial Assets Act (Chapter 590 of the Laws of Malta) (the “VFA Act”) qualify as a ‘virtual financial asset’.

**1.5** On the assumption that on the date of entry into force of the VFA Act, the Issuer will be undertaking the activity of offering a virtual financial asset to the public, the CIX 100 Offering may:

**1.5.1** if it has commenced prior to the 15th September, 2018, be exempt from submission of its whitepaper to the Malta Financial Services Authority (“MFSA”), but be in any case subject to a notification to the MFSA clearly listing the Issuer’s name, the name of the token and the date on which the offering began; or

**1.5.2** if it has commenced after the 15th September, 2018 but prior to the entry into force of the VFA Act, be subject to submission of its whitepaper to the MFSA within three months from entry into force of the VFA Act.[1]

**1.6** The same principles set out in 1.5, are also applicable to the act of applying for admission to listing on a DLT exchange (as such term is defined in the VFA Act).

**1.7** As at the date of this opinion, the Issuer is not required to obtain any consent, approval, license or exemption by, or order or authorization of, or to make any filing, registration or similar act with any governmental authority in the Republic of Malta in connection with the execution and delivery by the Issuer of the Terms of Tokens or the performance by it of its obligations.”

## **“7.0 RELIANCE**

**7.1** This legal opinion is limited to the law of Malta as at the date hereof. We do not assume any obligation to advise any person entitled to rely on this opinion of any subsequent change in, or in the interpretation of, the law of Malta. We express no opinion on the law of any jurisdiction other than Malta.

**7.2** This memorandum of advice is strictly limited to the matters stated in it and does not apply by implication or otherwise to any other matters.

7.3 This memorandum of advice may not, without our prior written consent, be relied upon by any other person other than yourselves or otherwise disclosed or filed with any person or quoted or referred to in a public document (other than the Executive Summary part of this memorandum of advice).”



# Annex 1 - Zorax Factor Library



Group	Subgroup	Factor	Values	Methodology
PRICE	Price and volume factors			
		Rolling mean capitalization	Number	Average Of The Daily Caps For 30, 90, 180, And 365 Days
		Rolling mean traded volume	Number	Average Of Daily Traded Volumes For 30, 90, 180, And 365 Days.
		Volatility	Number	30 Days, 90, 180 And 365
		ATL current	Price	Lowest price
PRICE	Trend factors			
		Support levels	Number	Price has not gone lower than X +/- 1% in the last 30 days
		How many times the price touched this support level?	Number	The price was in the gap X_min plus 3%
		Resistance levels	Number	Price has not gone higher than X +/- 1% in the last 30 days
		How many times the price touched this resistance level?	Number	
		Support levels	Number	Price has not gone lower than X +/- 1% in the last 30 days
		How many times the price touched this support level?	Number	



SPECULATIVE	Listings factors			
		How many exchanges is the coin listed on?	Number	On how many exchanges does the coin appear?
		How long has the coin been traded?	Number of days	How long has the coin been traded?
PRICE	Price range factor			
		Coin in its 0-24% range	Number of days	Measured for 30, 90, 180, and 365 days
		Coin in its 25-49% range	Number of days	Measured for 30, 90, 180, and 365 days
		Coin in its 50-74% range	Number of days	Measured for 30, 90, 180, and 365 days
		Coin in its 75-100% range	Number of days	Measured for 30, 90, 180, and 365 days
PRICE	Correlation factors			
		Correlation with BTC	Array	Last 30, 90, 180 and 365 days
		Correlation with ETH	Array	Last 30, 90, 180 and 365 days
		Correlation array with all other coins	Matrix	Last 30, 90, 180 and 365 days
SPECULATIVE	Historical factors			
		Average number of trades	Number	30/90/180/365 days
		Average volume per trade	Number	30/90/180/365 days



		Ratio of actual traded volume to volume in orders	Number	The ratio of the real tUrn volume to the one in the order book
SENTIMENT	GitHub factors			
		Average weekly commits for the past 24 weeks	Number	The average number of commits uploaded to GitHub per week.
		Size of community	Number	Followers and stars
		Planning a new release	True/False	New releases and features that the team is working on
		Quality of developers	Number	Sum of the developers' scores based on their GitHub metrics
		Development intensity	Number	Intensity of development in the last 30 days compared to overall average speed of development
		Forks number	Number	Number of forks in the developers' repo
SENTIMENT				
	Google trends	Trend jump	True/False	AVERAGE OF THE DAILY CAPS FOR 30, 90, 180, AND 365 DAYS
	Google trends	Trend compare	Number	Analysis project's trend compared to overall cryptocurrency trend
	Telegram	Number of chats	Number	AVERAGE OF DAILY TRADED VOLUMES FOR 30, 90, 180, AND 365 DAYS.
	Telegram	Official sites activity	Number	Official project chats' metrics, calculated based on posts, users, admin comments
	Telegram	Official dev	Number	Evaluation of technical discussion in official chats
	Telegram	Community	Number	Frequency of project mentions in unofficial chats
	Telegram	Number of active users	Number	30 DAY CAP / 30 DAY VOLUME, 90, 180, 365



SPECULATIVE	Twitter			
	Twitter	Frequency of posts	Number	30 DAYS, 90, 180 AND 365
SENTIMENT	ORDER BOOKS			
		Delta between volume on the bid side and on the ask side in quote currency	Number	Difference between the cumulative orders volume sum in quote currency
		Delta between volume on the bid side and on the ask side in base currency	Number	Difference between the cumulative orders volume sum in base currency
		Sum of bid and ask volumes in the book	Number	Sum of the cumulative orders volume sum in quote currency
		Sum of bid and ask volumes in the book	Number	Sum of the cumulative orders volume sum in base currency
SENTIMENT	ORDER BOOKS			
		Number of trades (monthly) Number of trades (weekly) Number of trades (daily) Number of trades (per hour) Number of trades (per minute) Number of trades (per second)	Number	Cumulative number of trades in the period.
		Traded volume (monthly) Traded volume (weekly) Traded volume (daily) Traded volume (per hour) Traded volume (per minute) Traded volume (per second)	Number	Cumulative volume in the period.
		Maximum price growth speed in the last 3 months	Number	((High - low)/low) divided by number of days between them if high happened later, than low



		Maximum price drop speed in the last 3 months	Number	$((\text{High} - \text{low})/\text{high})$ divided by number of days between them if low happened later, than high
		Largest trade by volume in base currency in the last day	Number	The value of the largest transaction during the last day in the base currency
		Largest trade by volume in base currency in the last week	Number	The value of the largest transaction during the last week in the base currency
		Largest trade by volume in base currency in the last month	Number	The value of the largest transaction during the last month in the base currency
		Largest trade by volume in base currency in the last 3 months	Number	The value of the largest transaction during the last 3 months in the base currency
		Largest trade by volume in base currency in all available time	Number	The value of the largest transaction during all the time available to us in the base currency
		Standard deviation of daily traded volume in the last week, month, 3 months	Number	The standard deviation during the said period using a standard formula
		Maximum traded volume jump in a week, month, 3 months	Number	Maximum traded volume jump in the said period
		Maximum traded volume drop in a week, month, 3 months	Number	Maximum traded volume drop in the said period

**[End of Document]**

# **Cryptoindex Limited White Paper v 1.3**

Cryptoindex Limited is a private limited company incorporated under the laws of the Republic of Malta having company registration number C 87268 and registered address at 171, Old Bakery Street, Valletta VLT 1455, Malta

