Crystal Token
Evolutionary Multi-Utility Token

Official Whitepaper v 2.0

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Concepts and motivations

Crystal Token is an ERC-20 token innovating the field of smart investments with the novel concept of Crystal AI Trading and different investment plans to satisfy the needs of all investors who desire a solid and constant passive income.

Throughout our roadmap, we propose several services which will put Crystal Token in a privileged position as multi-purpose utility token, creating revenue for the platform and for our community.

Crystal AI Trading

It constitutes a form of smart investment, which allows to invest Crystal Tokens in multi-currency automated trading operations, exploiting our AI driven trading bot, and other investment opportunities such as arbitraging and binary trading. The main benefit of Crystal AI Trading consists in the generation of a variable passive revenue daily, based on the outcome of our investment operations.

Additional details in a subsequent section of this white paper, and in the dedicated Crystal AI Trading leaflet available on our website.

Trading & Signals

We aim to offer to our customers the opportunity to perform automatic multi-currency trading, by investing CYL tokens on our platform, at the cost of fees applied on the profits generated. Trading will be also based on signals.

Advertising Campaigns

ICOs, projects and products will be able to advertise on our website, in a dedicated "Featured Projects" page and in our Telegram groups. Advertising services will be paid in form of CYL tokens.

Gaming & Betting

We will propose a selection of exciting games which will stimulate the creativity and the engagement of our users, enabling them to play and win prizes in form of CYL tokens.

Pooling

Our users will have the opportunity to organize themselves as a pool, in a straightforward manner and directly on our platform, to accomplish to various initiatives.

Marketplaces

It will be possible to sell and buy goods and services, using CYL as a currency.

Debit cards

In the long term, we aim to distribute debit cards which would allow loyal users to spend their tokens directly in the offline shops. As already anticipated, we will discuss all our decisions with our customers.

Each of the mentioned services generates revenue for the platform, which guarantees the sustainability of the investment programs. Additional income is generated by our trading activities, internal exchange fees and auto-burn as explained in the following.

Multi-currency trading bot

The core business of our platform is the trading of cryptocurrencies, which is carried out automatically via a dedicated trading bot, developed by our research team. Some details about the technologies exploited by our trading bot are reported in the following section.

Internal exchange

Crystal Token proposes an innovative internal exchange based on the concept of time window. Crystal Exchange manages sell and buy transactions of CYL tokens and ETH. Each transaction falls within a time window, each of which is valid for three consecutive hours (hence, each day is divided in eight time windows).

During a time window, users can decide to sell or buy an amount of CYL tokens. Differently from a traditional exchange, the user does not need to specify a desired sell price. In fact, the price of a CYL token continuously oscillates until the end of the time window, purely on the basis of demand and offer.

More specifically, the price of a CYL token in a time window is calculated as:

$$CYL\ Price = \frac{Total\ ETH\ Sent}{Total\ CYL\ Sold}$$

where *Total ETH Sent* refers to the amount of ETH sent by all the users who want to buy CYL tokens. Therefore, a user who sent a certain amount of ETH to buy CYL tokens will receive a number of CYL tokens calculated as:

$$Received\ CYL\ Tokens\ = \frac{ETH\ Sent\ by\ the\ user}{Total\ ETH\ Sent} x\ Total\ CYL\ Sold$$

Analogously, a user who sold a certain amount of CYL tokens, will receive an amount of ETH calculated as:

$$Received\ ETH\ Amount = \frac{CYL\ Sold\ by\ the\ user}{Total\ CYL\ Sold} x\ Total\ ETH\ Sent$$

The temporary token value before placing any sell or buy order is always updated in the Crystal Exchange section. However, the definitive price will be known only at the end of each time window.

Users who sell their CYL tokens are charged a 5% transaction fee which will be used for rebuy initiatives, in order to constantly sustain the value of the token.

This model significantly differs from that adopted by classical exchanges, since it is able to smooth the incurrence of high and low short-term peaks, leading to more stable prices. As a further positive effect, by limiting the amount of tokens that can be sold by each user in each Stage, strong dumping activities performed by the so-called "whales" can be significantly alleviated.

Auto Burn

A number of unused tokens will be periodically burned. This will increase the value of the token, due to its induced scarcity.

All the revenues generated from the services offered by the platform will be re-invested in initiatives aimed to increase the value of the token (e.g., tokens rebuy) and as additional funds for the program.

Trading Bot - Details

We aim to develop a trading bot which combines different strategies and adapts to different market conditions. Our trading bot will blend pure trading strategies with Artificial Intelligence (AI) and Machine Learning techniques which will guide the trading using predictive models as oracles.

Trading techniques

Our trading bot will implement the automated *Trailing Stop* technique. It is a well-known technique in traditional financial markets, which consists in following the price action of a specific asset, in order to keep it while it is increasing and selling it when its value decreases more than a specified percentage or value in USD. The technique takes advantage of the entire phase in which the assets increase in price, and it allows to minimize the loss thanks to the specified percentage. Trailing stop can exploit indicators such as ATR to measure average volatility as well as parabolic SAR and exponential averages for a specific number of periods. For example, parabolic SAR is a trend reversal indicator which visually indicates when a trend is finished and is about to invert his tendency. Therefore, monitoring this indicator during the trading process allows us to follow market trend and increase the profit by dynamically configure stop losses and take profits thresholds.

Another trading opportunity is given by arbitrage. The increasing number of cryptocurrency exchanges presents recurrent situations in which the price for a specific cryptocurrency is consistently different on. Arbitrage consists in exploiting this price margin by buying the cryptocurrency at the cheapest price available and selling it on a different exchange where its value is higher. The

successful outcome of this kind of operations depends by the rapidity of an automatic tool at hand, since the price difference margin is usually significantly reduced in terms of minutes. Another aspect to be covered is the precision: a volume and order book analysis is needed to understand if a selling operation has high likelihood of success on the exchange with higher prices. For this reason, we aim to develop a trading bot which rapidly and accurately identifies and exploits arbitrage trading opportunities.

Artificial Intelligence / Machine Learning techniques

Artificial Intelligence and Machine Learning techniques will be involved in our trading system in three different ways:

Predictive models

Artificial **Neural Network** models, **tree-based** models and **time series forecasting** models will be involved to predict cryptocurrency market oscillations, by exploiting time series data and textual news about cryptocurrencies. In particular, predicting the value in the following time instants in the time series will reveal if the current cryptocurrency being analyzed can increase its value in the future. Textual news will be subject to sentiment analysis to reveal the recent polarity (positive or negative) of public opinions and events related to the cryptocurrency. The combination of these two types of analysis can highlight which cryptocurrencies are potentially interesting for the near future, i.e. can be subject to a price increase. However, the availability of news is optional for the trading bot to work properly: if news are not available for certain cryptocurrencies, the system will use the other data sources to decide about trading operations.

Consensus approach via Ensemble Learning

Since the difficulty of predicting the market is known to be high, the outcome of multiple predictive models will be evaluated and combined in order to produce a final outcome which will determine trading operations.

In order to attack such a difficulty, we will adopt **Ensemble Learning** approaches. In general, *Ensemble Learning* involves a combination of multiple algorithms to improve predictive performances of a model. In the trading scenario, considering the case in which more predictive algorithms generate a price prediction for a specific cryptocurrency and a time horizon, a **Bagging** approach could be exploited to consider the outcome of each algorithm as a vote, and then to choose the majority vote in case of binary outcome (increase or decrease) or the average of the votes in case of a continuous value outcome (exact price prediction). As an alternative, a **Meta-learning** approach could be used to combine different predictions, involving a meta-model called *combiner*, which takes all the predictions as input.

Both approaches have been widely adopted in different fields and their effectiveness has been widely treated in the scientific literature.

Volume analysis and anomaly detection

Anomaly detection techniques involve the use of Machine Learning models to automatically detect anomalies in the current behavior of a phenomenon. In this context, **Auto-Encoders** could be employed to detect abrupt changes in the volumes of Bitcoin and altcoins in the market capitalization, and adapt the trading technique accordingly. In fact*, Auto-Encoders* are unsupervised Artificial Neural Network models which are trained in order to minimize the error in reconstructing the input representation. After a training process on data representing the current (normal) market situation, we can monitor the reconstruction error of new data. Once the reconstruction error starts to increase significantly, it is a symptom that the observed quantities, i.e. volumes, are deviating from the normal situation. This phenomenon could suggest changes in the trading strategy.

For instance, when the Auto-Encoder detects that capitals are being moved from altcoins to Bitcoin, it could be profitable to sell positions for such cryptocurrencies which are starting a negative trend, to benefit from the upcoming increasing trend of Bitcoin in terms of fiat currency. In the opposite case, when capitals are being moved from Bitcoin to altcoins, it could be profitable to sell Bitcoin and exploit the upcoming increasing trend of altcoins.
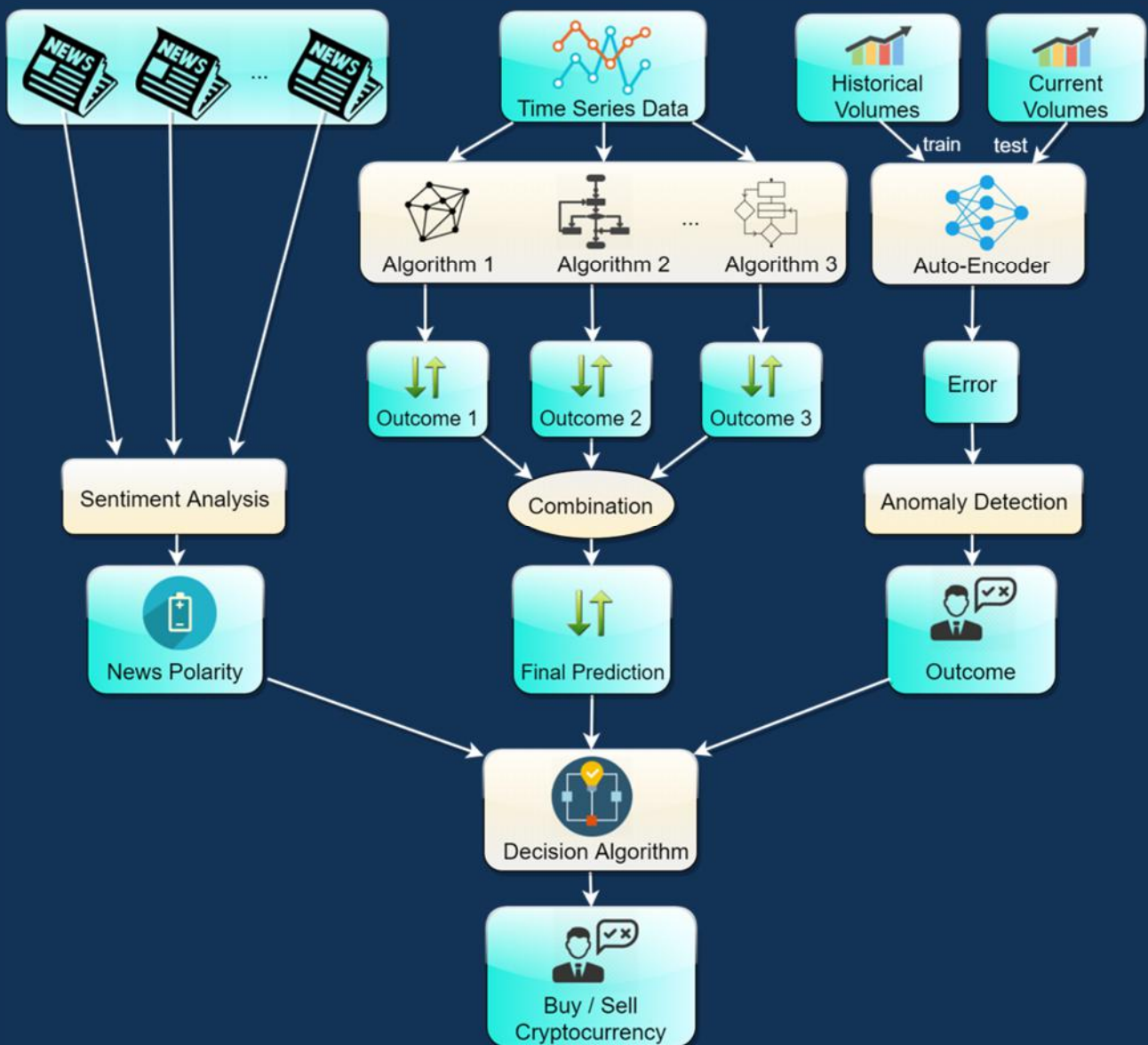

We believe that a combination of pure trading techniques and Machine Learning techniques could work well together to help avoiding wrong decisions, which could have been taken relying exclusively to one of the two approaches.

For example, the predictive analysis (volume analysis) would allow to select which cryptocurrencies to buy at a specific time point, considering their prospective increase in price (abrupt change in volumes). For the selected cryptocurrencies, the trading will rely on the automated Trailing Stop technique.

Trading as a service

We would like to offer a ***Trading as a Service*** feature to our investors, giving them the opportunity to perform automated multi-currency trading on different exchanges, exploiting trading signals. Users would be able to activate the service by setting up their exchange API keys (e.g. Bittrex, Poloniex, etc.) and they would be able to monitor trading transactions in real time. Users who reinvest their profits in our program will be exempt from any fees related to the *Trading as a Service* feature.
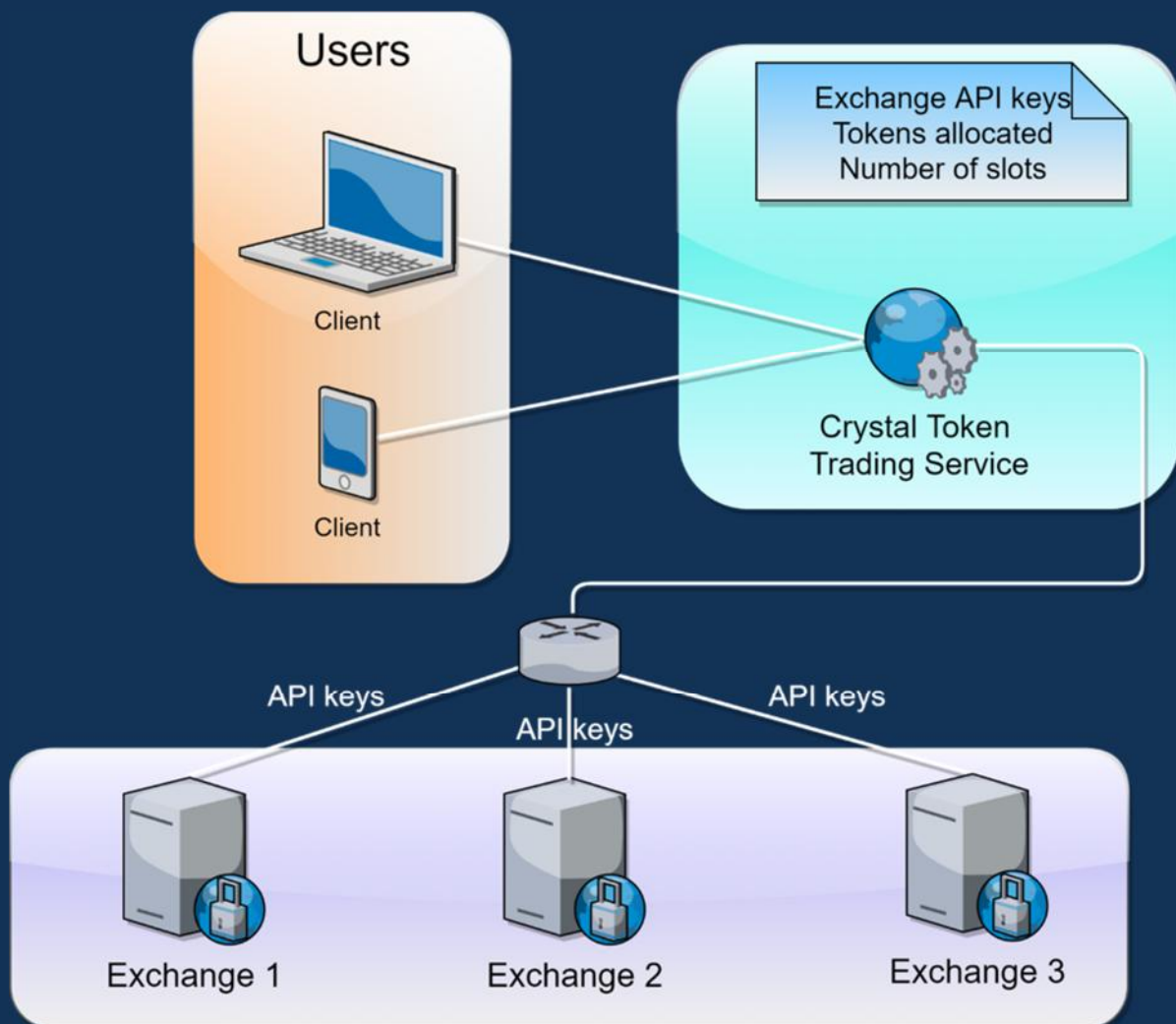
Crystal AI Trading

Crystal AI Trading is tailored for those customers who desire a solid and constant passive income source, capable to attack the huge volatility of cryptocurrency market.

Investing in Crystal AI Trading provides up to *2% daily interests*, depending on the market volatility and the trading operations performed.

The Crystal AI Trading is unique and is based on two different tokens:

- **CYL token**, our main ERC20 token sold during the ICO, exchangeable for ETH and usable to invest in Crystal AI Trading;

- **VCYL token**, our virtual token that will be used to pay daily interests. The value of a VCYL token is strongly tied to ETH and will be always worth **0.001 ETH**. They can be converted into CYL at the current market price, or withdrawn directly in ETH at the rate 1 VCYL = 0.0005 ETH.

For example, if the value of an ETH is 1,000$, the value of a VCYL will be 1$, while the market will decide the value of a CYL (that is, the CYL/ETH ratio). Customers will be able to invest in Crystal AI Trading by holding their CYL tokens into the dashboard or by converting their VCYL tokens earned as daily interests to CYL, at the current market price ratio.

For example, if a CYL token currently corresponds to 5 VCYL tokens, 100 CYL tokens will imply a value of 500 VCYL. The users should keep in mind that a VCYL is tied to the value of ETH, therefore the value of the investment could increase over time if the ETH value increases.
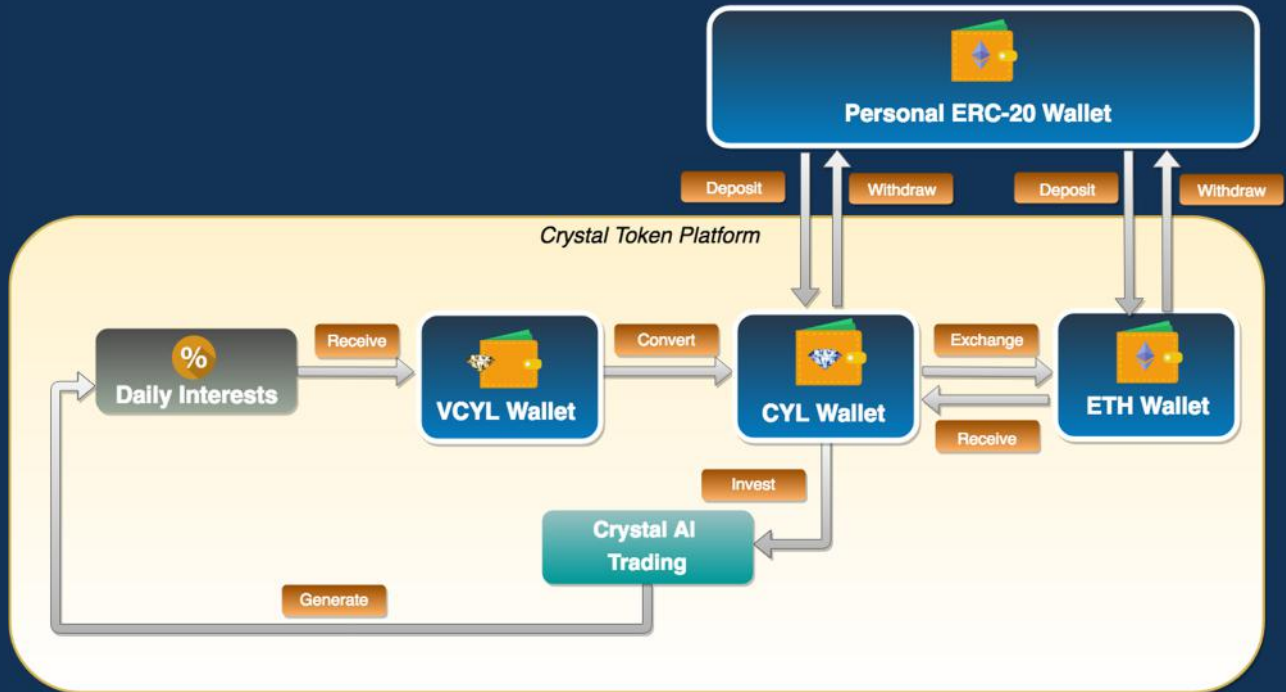
Crystal AI Trading significantly differs from classical investment programs and overcomes their limitations in the following ways:

- Interests are earned without locking tokens for long periods of time

- CYL Tokens can be sold anytime

- CYL/VCYL ratio is dynamic. This guarantees the sustainability of the investment program in the long-term: when bear market occurs we distribute less interests, while in the case of a market growth, we distribute more interests.

As an example, if in a given day, 1 CYL = 1.5 VCYL in the exchange, you will earn your interests according to that ratio. If the day after, 1 CYL = 4 VCYL, you will earn interests according to the new increased ratio.

The higher the CYL value, the higher the earning in VCYL!

Referral program

Our single-tier referral program allows to earn 50% of the fees raised in our exchange when people presented by you buy CYL tokens.

The distribution takes place in CYL tokens.

We believe that only the active promoters should be rewarded and that weak multi-level referral programs do not properly reward the real effort of active promoters.

Strong single-tier

referral commission

CYL Token Specifications

Multi-Utility ERC-20 Token

Max Supply 28M

Team Supply 2M

ICO Supply 2M

ICO Price 0.001-0.0014 ETH

Initial Circulating Supply 4M

Token Sale

Our Initial Coin Offering (ICO) took place in the period February 2018 – June 2018. The ICO was structured in a pre-sale and a main sale stage, divided in 5 batches with daily rounds and an incremental price (0.001-0.0014 ETH).
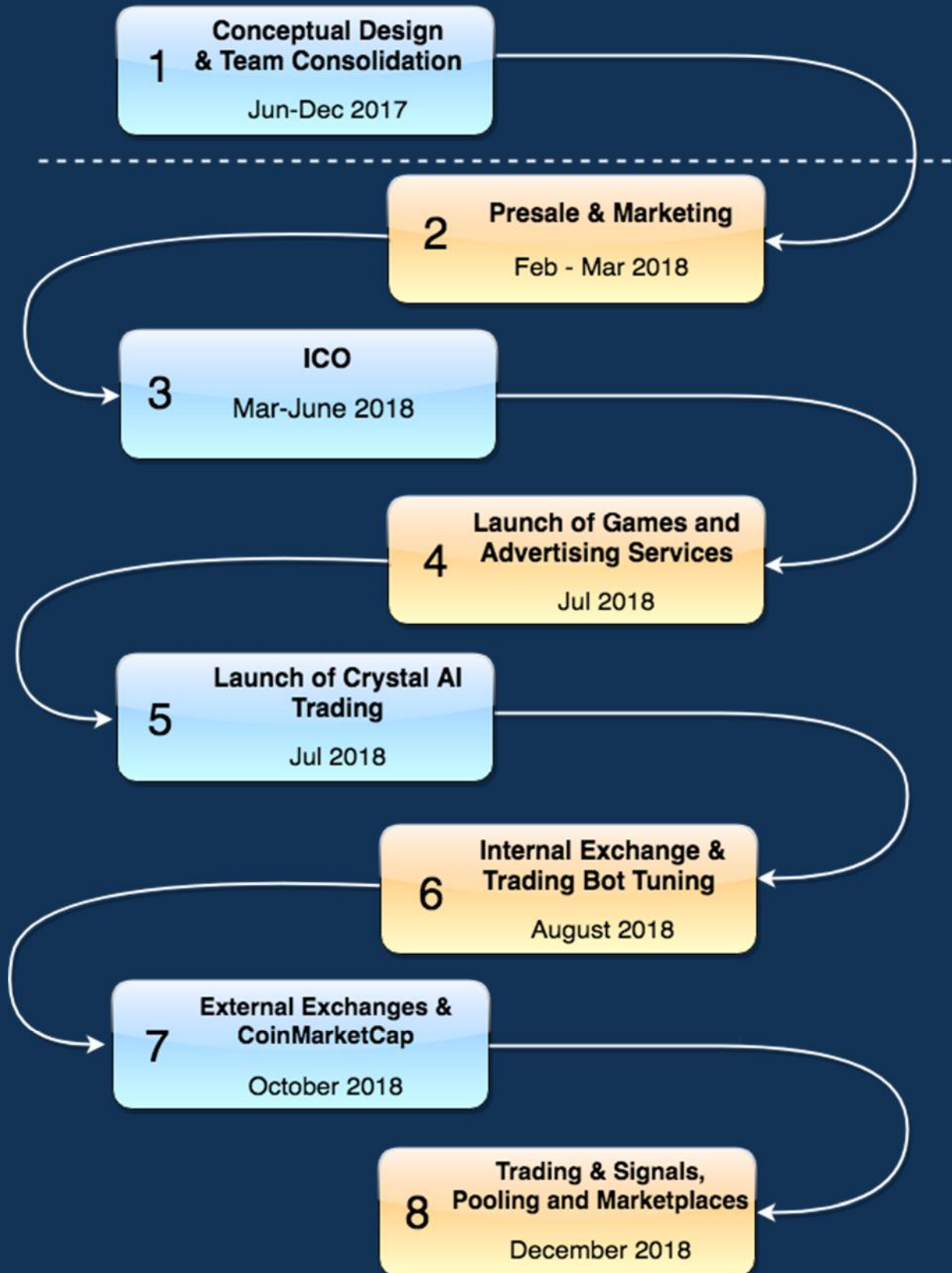
During this period, 10% of the received ETH in each day have been distributed to people holding CYL tokens. The distribution was made in terms VCYL tokens.

Overall, about 2M tokens have been sold during the ICO.

How to buy tokens

Our internal exchange allows to buy and sell CYL tokens using ETH. However, users who prefer to buy tokens with BTC, can deposit on the dashboard, and the amount deposited will be automatically converted into ETH at the current market rate.

The chart below outlines our prospective roadmap for the year 2018. The roadmap for the following years will be published once the maturity of the project for the year 2018 is enough to highlight the priorities for the next years.

1 Conceptual Design & Team Consolidation
Jun-Dec 2017

2 Presale & Marketing
Feb - Mar 2018

3 ICO
Mar-June 2018

4 Launch of Games and Advertising Services
Jul 2018

5 Launch of Crystal AI Trading
Jul 2018

6 Internal Exchange & Trading Bot Tuning
August 2018

7 External Exchanges & CoinMarketCap
October 2018

8 Trading & Signals, Pooling and Marketplaces
December 2018

Team

The currently uncertain and geographically varying legislation in the field of crypto currencies obliges us to take a preventive step for which our identities are not revealed. However, we can proudly state that our professional, decentralized, multidisciplinary core team consists of:

- *James*: Active for more than 15 years in the IT industry as developer and consultant for different companies. His vision in the field of sustainable and smart investments led to the design of the Crystal Token project.
- *Luke*: Expert in the analysis of data for the automated learning of predictive models.
- *Thomas*: Experience in the development of medium-large scale web applications.
- *Mikkel / Rebecca*: Expert in the development of Web Applications.
- *Mark*: Expert on blockchain technologies and cryptocurrencies.
- *Dean / Dominique*: Experience in manual trading. Consultant for the development of automated trading strategies.

Our first priority is to be a reliable, trustworthy and customer-driven platform. We will do our best to support every customer in any issue that he could experience, and to gather and make fruitful use of his feedback to improve the system. We will provide an internal ticket system and two Telegram channels: one for announcements and one for the community discussion. We will also publish regular announcements on Facebook and Twitter. Moreover, in the attempt to offer a democratic environment, we will provide a voting mechanism which will be activated when any crucial decision related to a change in the use of the platform is required. The final decision will depend from the majority of the votes obtained.

Marketing

Crystal Token has been featured on a wide range of reviews and press releases on specialized websites such as CCN, NewsBtc, BTCManager, IcoHolder, TrackICO, and so on. An updated list of press releases can be found on the bottom of our home page. Moreover, ICO specialists have featured us on Youtube, where they release recurrent updates and interviews with the team.

Disclaimer

Due to the experimental nature of the cryptocurrencies and their high volatility, unpredictable events can happen during the realization of every project. Issues from the technological viewpoint, as well as legal regulations, cyber-attacks or changes in the cryptocurrency environment can have impact on the outcome of the roadmap. The roadmap described in the whitepaper must be considered as a prospective development plan. Although Crystal Token team will put all its efforts to carry out all the required work, there is no guarantee that all the steps in the roadmap will be carried out with good results and exactly as planned. Thus, we would like to inform our users to invest at their own risk.

Our team also recommends to adopt a strong password and to store it safely, and to activate Two-Factor Authentication (2FA) as an additional level of security. Crystal Token team will not be responsible for any possible losses. By participating to Crystal Token ICO and to the virtual staking program, our users acknowledge that they understand and accept the risks involved in the program explained above and that every operation performed by the user are not revertible.