Crystal Token

Evolutionary Virtual Staking

Official Whitepaper v 0.95

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Concepts and motivations

Crystal Token embraces the rise of crypto currencies and of services aiming to provide customers with a stable passive income. The birth of Bitconnect in 2016 has been seminal in this field, offering a lending platform providing this type of investment. Following the success of BitConnect, a consistent number of crypto currencies offering lending services have been released in the last part of the 2017. However, very few of them survived, and, starting from BitConnect itself, have been abruptly shut down causing consistent losses for many investors.

We believe that this happened due to the following major limitations:

Long-term capital release

Existing platforms offer packages in which the capital of the customer is locked for a period of time ranging between 3 and 8 months. Although this mechanism certainly favors the platform, which can have more money invested in trading, it is not flexible for the customer, who could experience the unexpected necessity of his capital back before the expected end date, due to a variety of reasons. Moreover, the reward obtained by the users that keep their money invested in the platform often appears limited with respect to just holding the tokens and waiting for an increase of its value.

Hidden business models

Many platforms claim that their business is based on trading operations, but there is often no evidence about such activities. One hypothesis is that their success has been possible so far due to the increasing interest in Bitcoin, and the consequent increase in volumes invested. In fact, classical lending programs retain users' Bitcoin and pay their interests in dollars, calculated on the initial BTC/USD rate at the time the contract starts. Although this mechanism worked well so far, its sustainability could not be guaranteed in the case of a prolonged stabilization or decrease of the value of Bitcoin. In this case, users' interests could be paid only if new members join the program, taking place to a Ponzi scheme. It is clear that there is the need to research for sustainable programs which rely on multiple business models.

Vertical management

Current terms and conditions in existing platforms allow the management to abruptly change anything related to the use or the functionality of the platform without pre-approval of the customers. This has shown to be a major problem when a new condition impacts the freedom and the mindset of a portion of customers. We believe that Customers should participate in any decision that could impact their use and experience on the platform, and be free to opt-out when they do not agree with a specific change in the platform.

Single trading bot strategy

The rapid evolution of the crypto market makes impossible to be profitable over time adopting the same trading strategy. For this reason, it would be advisable to exploit different trading strategies and adapt to different market conditions.

Lack of constant customer rewards

Existing programs tend to be too similar with each other, with minor changes in the capital release terms and daily percentage of daily interest. There is limited incentive for loyal customers who invested their tokens over time, which creates abrupt capital movements in favor of new platforms with higher interest rates or more interesting promotions.

Limited ability to spend the token

Customers usually spend the token exclusively on the platform with the sole purpose of participating to the investment program. It looks clear that enabling new services such as marketplaces and debit cards would create more value and growth for the token.

For all these reasons, we believe that there is a good margin for improvement in this fast-paced crypto currency environment. Our objective is to provide a token that overcomes all these limits, offering transparency, reliability and sustainability.

Business Models

Throughout our roadmap, we propose a number of features which will create revenues for the platform and our customers:

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.

Trading as a service

Once the trading bot performances have been assessed, we aim to offer to our customers the opportunity to perform automatic multi-currency trading, by investing Crystal Token tokens on our platform, at the cost of fees applied on the profits generated.

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 six consecutive hours (hence, each day is divided in four 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 round, 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.

Marketplaces and debit cards

A number of additional services exploiting our token will be developed, in order to provide additional value to Crystal Token. In particular, we aim at developing a marketplace and, in the long term, 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.

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

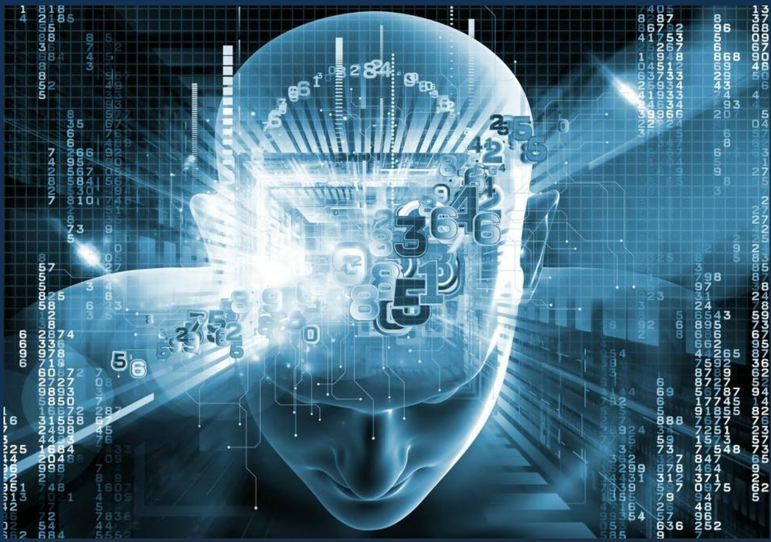
to minimize the loss thanks to the specified percentage. Trailing stop can exploit indicators such as ATR to measure average volatility as well as parabolic SAR and exponential averages for a specific number of periods. For example, parabolic SAR is a trend reversal indicator which visually indicates 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.

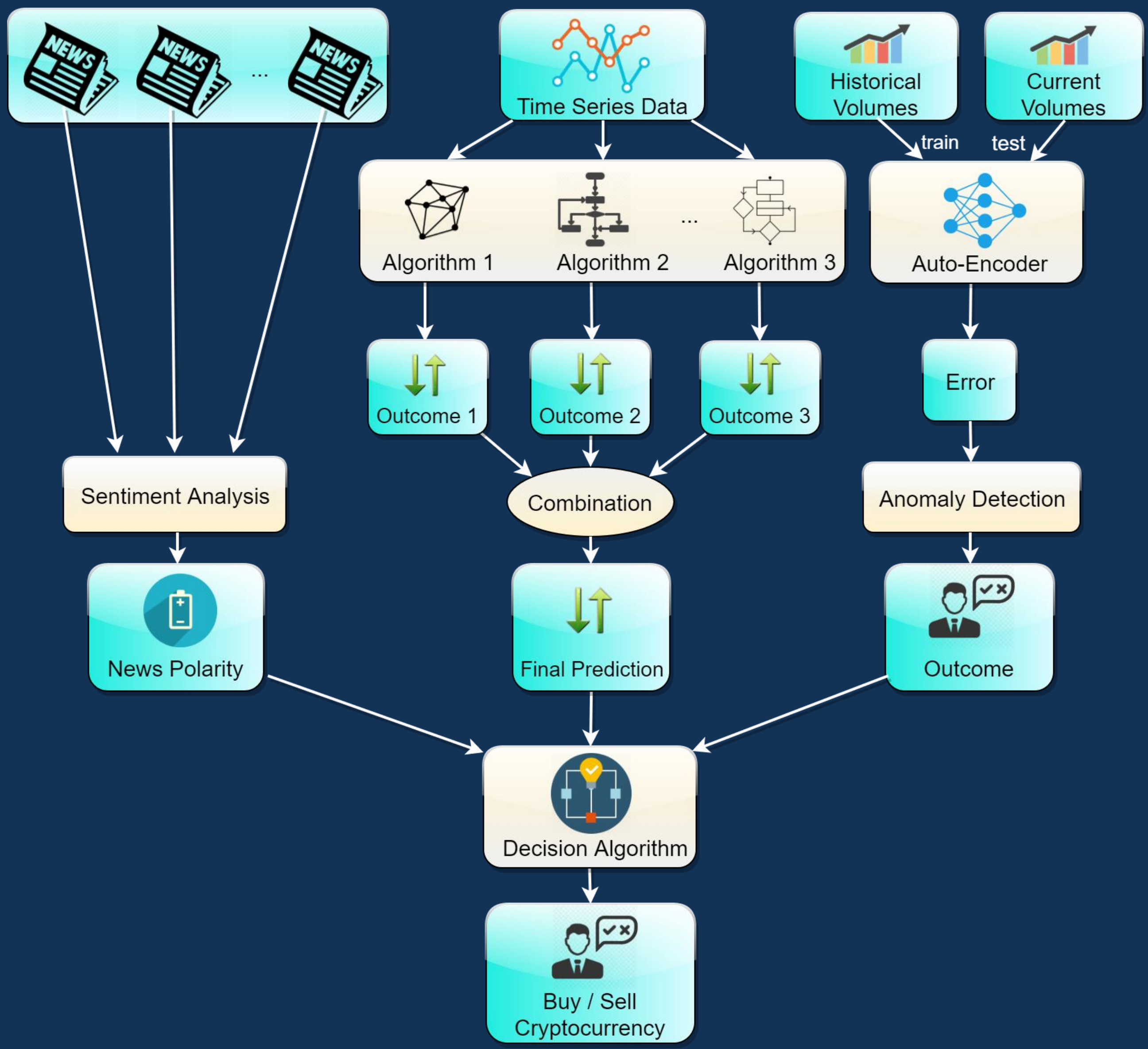
In order to attack such a difficulty, we will adopt ***Ensemble Learning*** approaches. In general, *Ensemble Learning* involves a combination of multiple algorithms to improve predictive performances of a model. In the trading scenario, considering the case in which more predictive algorithms generate 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.

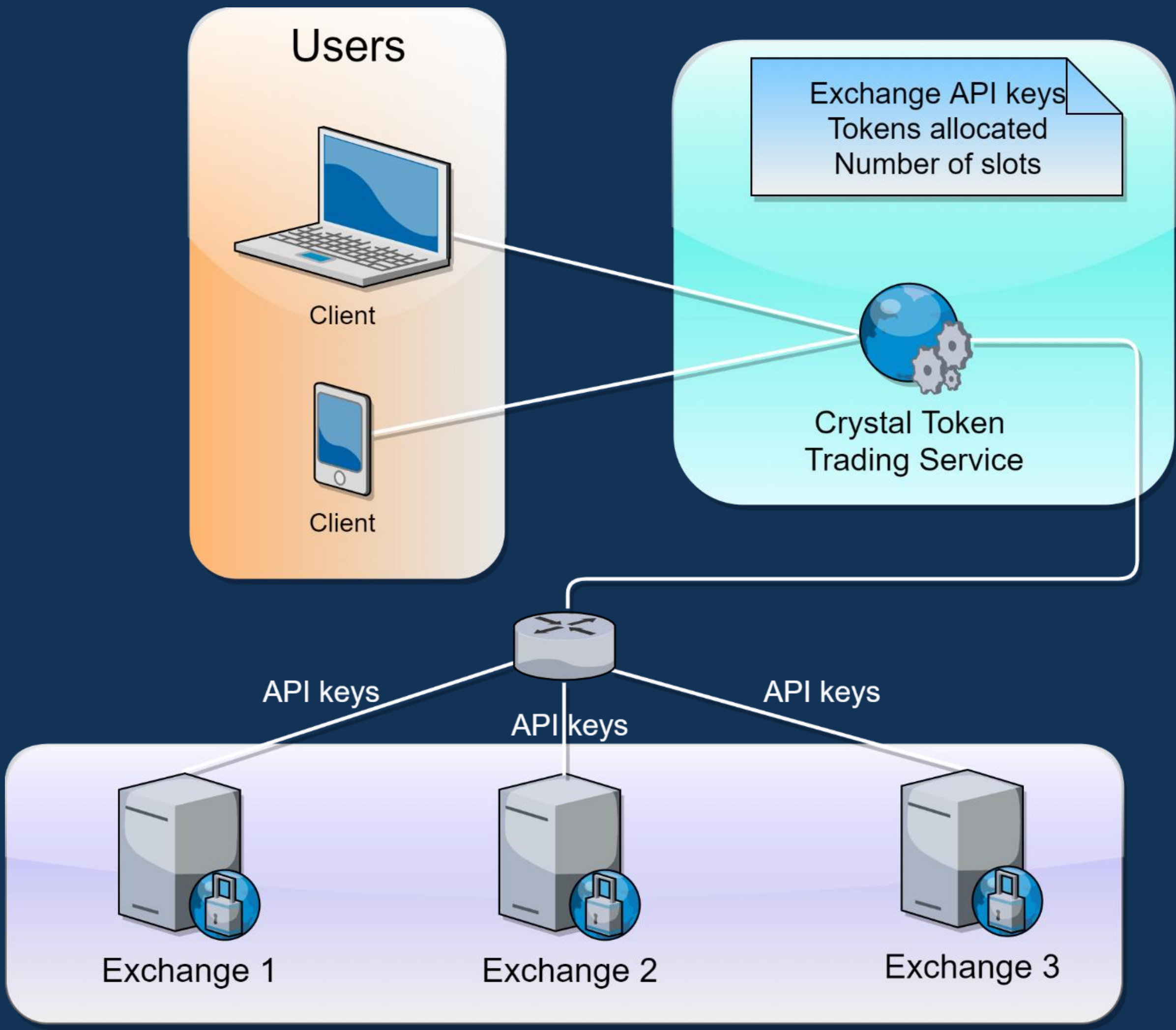


We believe that a combination of pure trading techniques and Machine Learning techniques could work well together to help avoiding wrong decisions, which could have been taken relying exclusively to one of the two approaches.

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 automatic multi-currency trading on different exchanges, exploiting our trading bot and Crystal Tokens. 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.



Full-benefits Virtual Staking Program

The full-benefits ***Virtual Staking*** program is tailored for those customers who desire a solid and constant passive income source, capable to attack the huge volatility of cryptocurrency market. We offer competitive plans with three different ranges of investments.

Each plan provides increasing benefits, as specified in the following. The actual percentage of interest can reach up to ***2% daily*** and depends on the market volatility and the trading operations performed, and it will be made public on a daily basis.

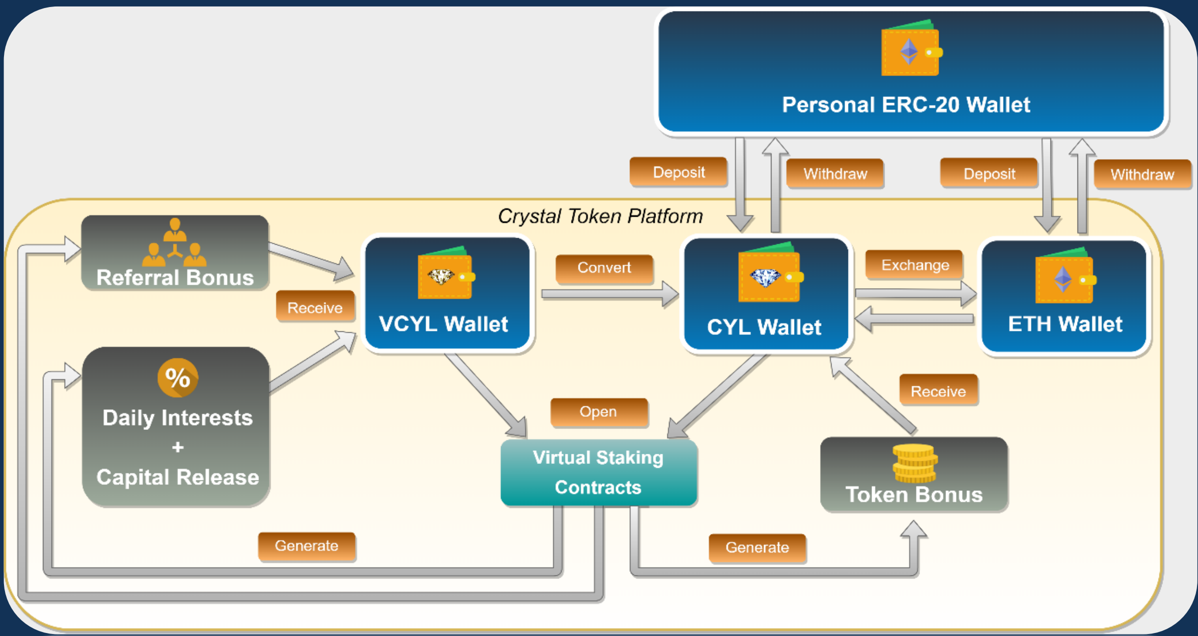
Our Virtual Staking Program is unique and is based on two different tokens:

- **CYL token**, our main ERC20 token which will be sold during the ICO, exchangeable for ETH and usable to open a Virtual Staking contract;
- **VCYL token**, our virtual token that will be used to pay daily interests and referral bonuses. They can be converted to CYL tokens at the current market price. The value of a VCYL token will be strongly tied to ETH and will be always worth **0.001 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 open a Virtual Staking contract by spending their CYL tokens, that will be converted In VCYL tokens by the system, or directly from VCYL tokens earned as daily interests or referral bonuses.

For example, if a CYL token currently corresponds to 5 VCYL tokens, opening a contract with 100 CYL tokens will lead to a contract 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 contract could increase over time if the ETH value increases.



The proposed Virtual Staking plans significantly differ from the classical staking plans and overcome all the limitations of past lending and staking platforms: people will never have to choose between holding their tokens and opening a contract in the platform, since our plans also provides CYL tokens as a reward at the end of the contract. For example, customers who invest more than 2,500 VCYL will receive ***3%*** of their initial invested tokens in CYL; customers who invest more than 10,000 VCYL will receive ***7%*** of their initial invested tokens in CYL. For example, if a user opens a contract of 1,000 CYL worth 5 VCYL each, the contract value will be 5,000 VCYL, according to which daily interests will be paid. At the end of the contract he will receive the capital back (5,000 VCYL) plus 30 CYL tokens at their current value, which could also worth 10 times the initial invested capital. This reward represents the ultimate solution to the contrasting strategies adopted by professional cryptocurrency traders, who always must decide whether hold their tokens or opening a contract in a platform.

Moreover, we also offer the user the possibility to boost such a bonus by enabling the ***Token Bonus*** option which rewards an additional ***3%*** of the CYL tokens invested in a contract, when it is prolonged for 30 days. Note that during such 30 days, no daily interests are paid out to the user.

A third advantage of our full-benefits Virtual Staking program comes from our unique ***pure reinvest*** function. Indeed, many people would prefer to increase their final profit, instead of withdrawing the daily interests. Manually opening a new contract each day leads to frustration and to the creation of a new contract with a new capital release date. With Crystal Token, when opening a new contract, you will be able to enable our pure reinvest function, which will automatically reinvest your daily interest ***in the same contract*** (no additional time for the capital release). Note that in any case the maximum amount of earned daily interest will be the 2% of the initial capital.

Silver Plan	Gold Plan	Crystal Plan
100 - 2,500 VCYL	2,501 - 10,000 VCYL	10,001+ VCYL
Up to 2% daily	Up to 2% daily + 3% CYL tokens at capital release	Up to 2% daily + 7% CYL tokens at capital release
Release after 180 days	Release after 150 days	Release after 120 days

Pure Reinvest

CYL Token Bonus

Virtual Staking Program

Short-term Virtual Staking program

The short-term program is tailored for customers who prefer a shorter capital release. There are three different terms, each of which open to different levels of investors. The sustainability of the short-term program is guaranteed by a lower interest rate when compared to the full benefits program. Moreover, short-term packages do not provide CYL tokens at the capital release date.

Short-90

100 - 2,500 VCYL

Up to 1% daily

Release after
90 days

Short-60

2501 - 10,000 VCYL

Up to 1% daily

Release after
60 days

Short-30

10,001+ VCYL

Up to 1% daily

Release after
30 days

Innovative short-term plans

Referral program

We offer a strong single-tier referral program which gives rewards in VCYL to the referee according to the contracts activated by his subscribers. 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 10%

single-tier contract bonus

CYL Token Specifications

Initial Coin Offering

Our Initial Coin Offering (ICO) has been designed in order to make the experience of the user satisfactory and without frustration.

Dynamic schedule of rounds

We aim for a hassle-free ICO buy experience and for a fair distribution of the tokens. There is nothing worse than frustrating ICO sessions in which only 10% of the interested people is able to actually acquire tokens, often by exploiting automated bots. For this reason, the rounds schedule will be dynamic, based on the current demand. The default schedule will be ***3 days for each round***, but if a too limited number of users was able to buy, considering the ratio between the amount of successful transactions and the total amount of transactions, the next round will be scheduled in the following minutes. Otherwise, the next round will be scheduled in the successive 48 hours. This will reduce the probability that a large amount of users have to retry the buy procedure everyday, with the subsequent frustration for not being able to buy tokens.

Distribution based on Smart Contract

We adopt a token allocation procedure based on the ***Ethereum blockchain***. In fact, all the required functionalities will be implemented in the ERC20 contract. Hence, to participate to the ICO, an ERC20 compatible wallet is necessary. We suggest you to open a MyEtherWallet (MEW). Instructions to open and use a MEW wallet can be found here.

No locked money

Several platforms let users to deposit their money in the platform before buying the tokens, without the possibility to withdraw until all the ICO rounds have been completed. This issue, combined with the fact that it is hard to buy tokens, increases users' frustration. Our token distribution is fair and it is based on the Ethereum blockchain. Therefore, ***first send money, first served! No locked money! No bots!*** Moreover, an adequate limit on the number of tokens that can be bought by each user will be announced on the website.

ICO rounds distribution of CYL Tokens

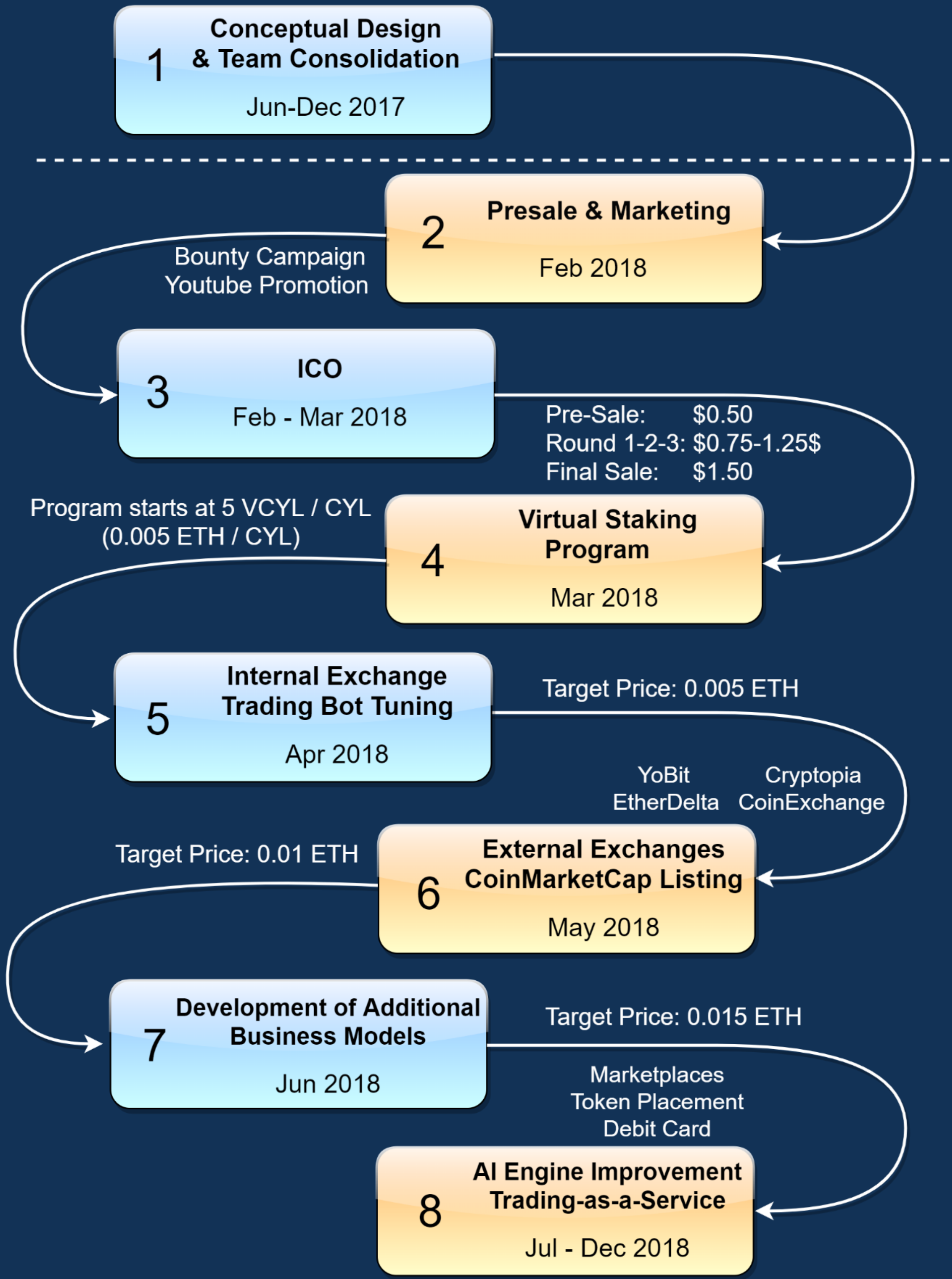
The Virtual Staking program will start at a fixed price of **5 VCYL for each CYL**, that is, **0.005 ETH / CYL**. Even the buyer at the last round will have the chance to start with more than 300% profit. Please note that all the CYL tokens will be locked (i.e., non-transferrable) until the end of the ICO.

Virtual Staking starts at 5 VCYL / CYL (0.005 ETH/CYL)

Guaranteed > 300% increase of the CYL token value

Roadmap

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.



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 team consists of:

- Two Artificial Intelligence / data science experts (> 5 years experience);
- Three web developers;
- One expert on cryptocurrencies;
- One economy consultant (> 5 years experience);
- Two professional traders;
- Two experts for technical support and social media marketing.

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.

Professional Team

&

Community-based Decisions

Marketing

We will do our best to guarantee a proper advertisement of the platform. Our marketing plan will include, but will not be limited to, the following activities:

- **Allocate bounties** to users who contribute with white paper translations and banners for the referral program of the platform;
- **Reach YouTube promoters and blogs** to ask them to review the platform, also offering the opportunity of an interview on their channel;
- **Open a thread on Bitcointalk forum** to explain our project and answer to any related questions;
- **Design promotional material** such as videos and GIFs to publish periodically on social media such as Twitter, Facebook and Telegram.

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 Autentication (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.