

# The Picoło project

Whitepaper version 3 (private release)

January 2018

A supplementary technical paper can be found [here](#)



## Picoło

## Betting platform for cryptocurrencies and tokens

A platform where you can play betting games with other users and participate in cryptocurrency discussions. The platform digests all data created on the platform, combines it with external sources and feeds it into AI algorithms that predict price movements on different time scales. LSTM networks are used for sophisticated sentiment analysis on textual data and reinforcement learning methods are used for analyzing structured data. All bets can be placed with a single platform token, eliminating the need for holding multiple cryptos.

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## 1. Introduction

Crypto space is exploding. The year 2017 will be remembered as the year when the blockchain technology starting taking off. More than \$3 billion were raised in ICOs (initial coin offerings) in 2017 alone surpassing the amount of early stage venture funding. Bitcoin, the first digital currency has crossed the psychological barrier of \$10,000 per unit and has a market cap of \$260 billion dollars - almost triple than that of Goldman Sachs. The total market cap of all cryptos has risen from \$18 billion USD at the beginning of 2017 to over \$600 billion USD at the end. It is hard to think of any industry that has undergone such a rapid growth and contributed to tremendous wealth creation in such a short time.

Clearly, cryptocurrencies are going mainstream but the ecosystem is severely underdeveloped. For example, buying bitcoin or any other crypto is a long process for first timers. There is no futures markets for crypto tokens (except a few pairs). UI/UX is terrible. There are no reliable sources of information to learn about cryptos. This is a relatively new industry and the total market cap of all cryptos (\$750 billion as of January 2018) is a miniscule fraction of that of other asset classes like stocks (\$75 trillion) or derivatives (\$500 trillion). It has the potential to reach the status of these traditional asset classes but the problems mentioned above need to be addressed first.

Here an innovative platform is proposed that solves the absent futures markets and reliable information sources problems at the same time. The platform does this by combining several concepts from the fields of mechanism design, game theory and artificial intelligence.

## 2. Problem

Crypto industry is new. A vast number of infrastructural components that exist in the traditional asset class industry are non-existent in the crypto world. For example, absence of derivative markets leads to several problems for investors:

- Inability to hedge risk
- Limited trading options
- Severe lack of liquidity for most tokens
- Inability to take short positions
- Very limited portfolio diversification options

Consider these scenarios:

1. You want to short a crypto: You have good reason to believe that the price of a crypto will go down in the future. On today's exchanges you can't short it to gain from your analysis. On our platform, you can simply place a bet that the price of crypto will go down and win if it indeed does. No need for a special financial derivative that allows you to do this.
2. You want to go long on a crypto but don't want to buy it: Your analysis showed that the price of a crypto will go up in the future. Again you can simply place a bet that it will go up without actually purchasing it or any of its derivatives.
3. You don't have time to actively manage your portfolio: Our platform allows you to join a syndicate that places bets for you where profits are distributed to all members of the syndicate.
4. There isn't enough liquidity: Not all cryptos have the liquidity levels of bitcoin and ethereum. On our platform, you can place bets against AI agents in addition to users and not worry if a token has enough liquidity for trading.

Second problem that needs to be solved is the information unreliability problem. Crypto is a fast moving world. There are countless sources to keep track of, lots of information and misinformation, questions and new developments. Information is rarely useful when it is thinly spread across. In contrast, an amalgamation of a variety of informational sources and opinions paints a clear picture of all the developments in the space and is hugely beneficial to all the stakeholders. There doesn't exist a single repository of such information today. Sites like steemit, coinmarketcap, countless "upcoming ICOs and (questionable) analysis sites", coindesk, the merkle tree etc have a unidirectional flow of information. Readers have few ways of contributing on these sites. There are a number of facebook groups related to cryptocurrencies and trading that have the same purpose - to build a community and ask questions, but being siloed is defeating their purpose. Data created on these sites is not very valuable for two reasons: 1) There's nothing at stake; it is easy and inconsequential to falsify information and 2) It is unstructured which makes it hard to draw insights from.

To solve this and the no futures market problem, we propose the solution below.

### 3. Vision

Here we present a platform that addresses the problems above. There will be three components in the platform:

- Betting
- Prediction AI
- Syndicate betting

#### 3.1 Betting as a secondary market

Today's crypto exchanges are far behind traditional exchanges in terms of their trading capabilities. For example, futures trading is non-existent. This is a severe limitation that needs to be removed. On our platform you can take bets on price movements of cryptos and earn big when you win. You can take these bets against other users or even our AI!! You place bets using the platform's native token irrespective of what you are betting on. For example you can bet on price movements of bitcoin, ethereum, monero etc using our token. It is not necessary to actually own the underlying coin/token you are betting on. Features include:

- Diversify your portfolio to include any number of cryptos without actually owning them. All you need to do is take bets on various cryptos.
- Different bets in terms of amount, price and time with different users where you solely control all aspects of the bet. Contrast this to a traditional futures market where pricing is central and you have no control. As an example:
  - Bitcoin is trading at \$15000
  - You can bet 100 tokens that it will fall to \$14000
  - With another user, you can bet 50 tokens that it will fall to \$13500
- Hedge your risk. Example - you own bitcoin and are bullish on long term but bearish on short term. You can take a bet against it on the short

term and profit if the price indeed goes down. If the price goes up, you will lose the bet but since you are long on the actual underlying you might still profit. This is very similar to futures trading.

- No need to go through the formalities and high fees of a centralized exchange.
- No counterparty risk since the bets are stored on the blockchain.
- Portfolio feedback and betting. Users can post their portfolios for feedback and make them available for betting on by other users.
- Live view of hot bets

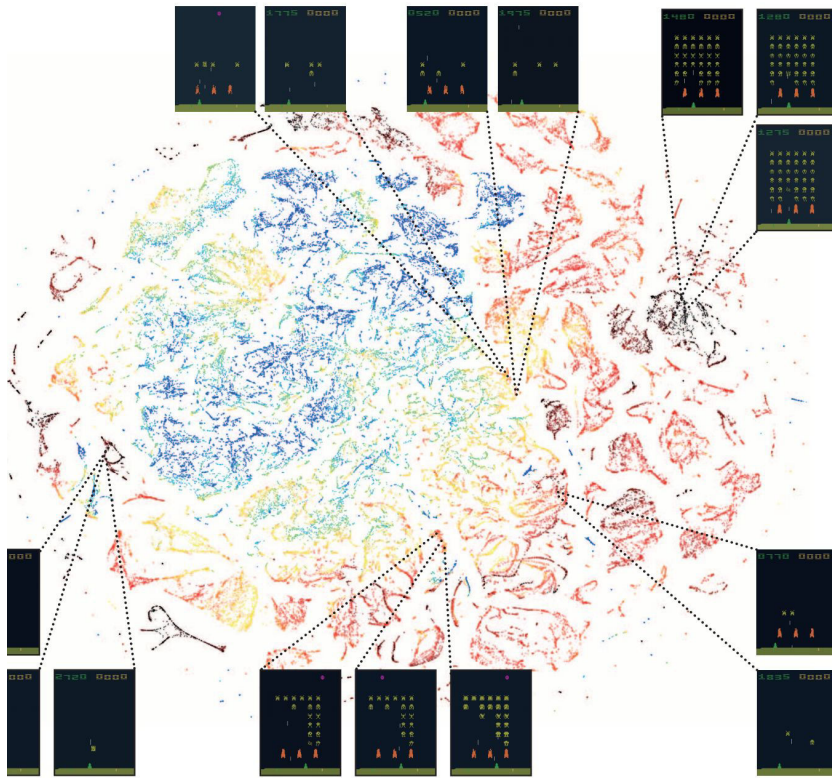
#### 3.2 Prediction AI and bets as information source

Every piece of textual data created on the platform is analyzed for sentiments regarding cryptos. Powerful artificial neural network architectures called LSTMs (Long Short Term Memory) are used for this task. While most research in this area is focused on binary classification (positive or negative sentiment), these networks can be trained to detect how strong the sentiment is. This will allow to make better predictions like "we are 90% sure of the price going up" as opposed to "price will go up". In addition to text, structured data in form of polls, bets and various "games" is collected. This data is appropriate to train a class of AI algorithms using a technique called reinforcement learning. Intuitively, the AI is rewarded when it makes a correct prediction and penalized when it doesn't. So overtime it learns to be more accurate. See the technical [paper](#) for more details. If you are curious, below is a visual representation of an AI's brain trained using a Deep Q Network while playing space invaders. Q learning is a form of reinforcement learning and is one of the most effective forms of training an AI agent.

Features:

- Interactive agent that answers questions like "when ethereum moon" in real time
- AI trading suggestions
- Live view of hot AI predictions

- Auto generation of ICO reports



Source: <http://www.davidqiu.com:8888/research/nature14236.pdf>

### 3.3 Syndicate betting

This feature allows for the formation of syndicates. Much like syndicates in angel investing where several angel investors form a syndicate to invest collectively, platform tokens can be pooled from individual users and the resulting syndicate can take bets on behalf of the them. Returns are then

distributed proportionally to individual users. A user might want to join a syndicate in the following cases:

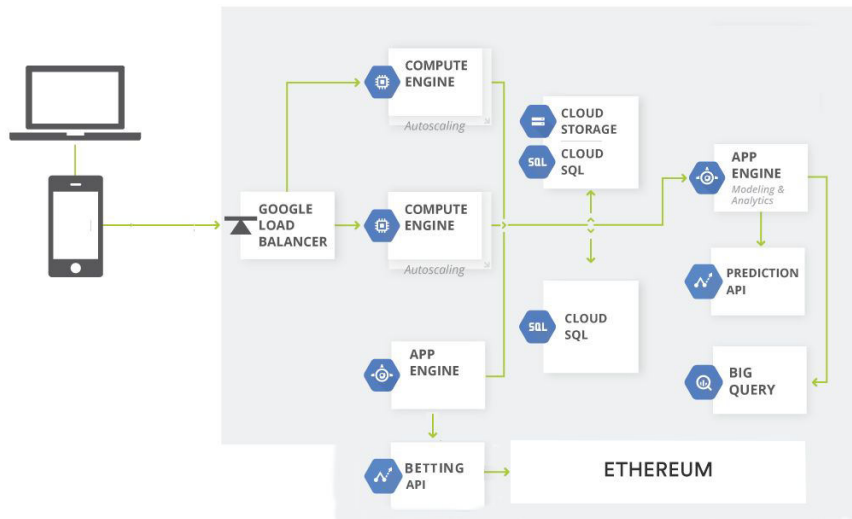
- Time constraints to do proper research for taking bets
- Limited expertise in the crypto space
- When a bet amount is high and a single user can't or don't want to risk a large amount on a single bet

### 3.4 Additional features

- Bets on tokens that are not yet available for trading
- Betting on ICOs
- Token specific channels for discussions, asking questions, comments etc.
- A loaded user profile with features like favoriting ICOs, watching tokens, live portfolio view, bookmarking comments, saving other users' portfolios etc.
- Open-endedness of the platform:
  - Users can suggest features and pay third party developers in tokens to develop them. These features can then be integrated into the platform
  - Third party AI developers can use the data from the platform to train their algorithms and sell their predictions on the platform or have their AIs take bets from users
  - Financial analysts and trading gurus can sell trading tips on the platform to users
- AI to AI betting. AI developed by third party developers can take bets against AI developed by other third party developers or against the platform's AI
- Bet recommendations based on a user's previous bets
- Leveraged betting. If the price of the token goes up after a bet is placed, additional tokens will be made available to the user for betting. If the price comes down after additional tokens are used in a bet, a margin call will be made to account for the price decrease

## 4. Solution

A web and mobile platform that realizes the above vision. Most of the program logic will be hosted as a collection of cloud services including UI, registration and login, data storage and runtime. Functionality that requires trust and immutability makes use of the ethereum blockchain. A high level architecture is given below:



Thing to note: The above picture shows ethereum as the blockchain in use only as an example. We plan to build the platform blockchain agnostic. We foresee using multiple chains like neo, dragonchain, rchain and others to fit our scalability and transaction speed needs.

## 5. Token economics

Most actions performed on the platform are associated with a token. Examples: Closing a bet requires payment of a small platform fee, AI trading suggestions are sold in tokens, creating a syndicate requires the creator to pay tokens. All of this makes sense only when the economics of the token are rooted in a solid supply and demand mechanism.

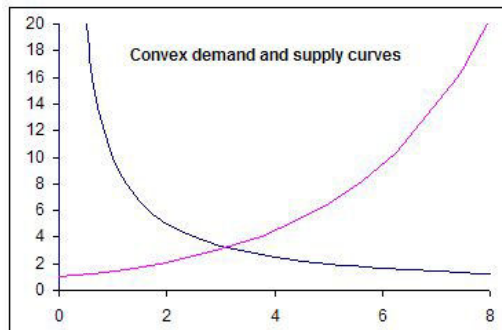
### 5.1 Supply side

- Genesis supply - tokens generated during presale and main sale events
- Additional tokens may be generated by community vote in these cases:
  - To account for lost tokens due to misplaced private keys or the ones sent to wrong address
  - To discourage bad actors trying to hamper platform usage by holding up a large supply of tokens
- Participating on the platform earns users tokens (taken from the genesis supply). Various forms of participation include:
  - Registering for the platform
  - Bringing new users
  - Contributing to the R&D of the platform

Initially, the incentives for participation are high and gradually decrease as time progresses and the value of the platform increases. Possible heuristics:

- For every 50000 users, bonus for registration is halved. So early users get exponentially high bonus compared to late registrations.
- If bringing the first 100 users awards 10 tokens, bringing the next 100 users may award 5 tokens only

See the [technical paper](#) for decay functions. Graph below visualizes it:



## 5.2 Demand side

Tokens are required in the following cases:

- Closing a bet
- Purchasing AI trading suggestions
- For creating a syndicate
- For joining a syndicate
- For promotional content
- Third party AI developers need to pay platform fee for selling their trading suggestions or upload their AI to take bets from other users and AI
- For purchasing data by third party AI developers for training their algorithms

## 5.3 Genesis token supply

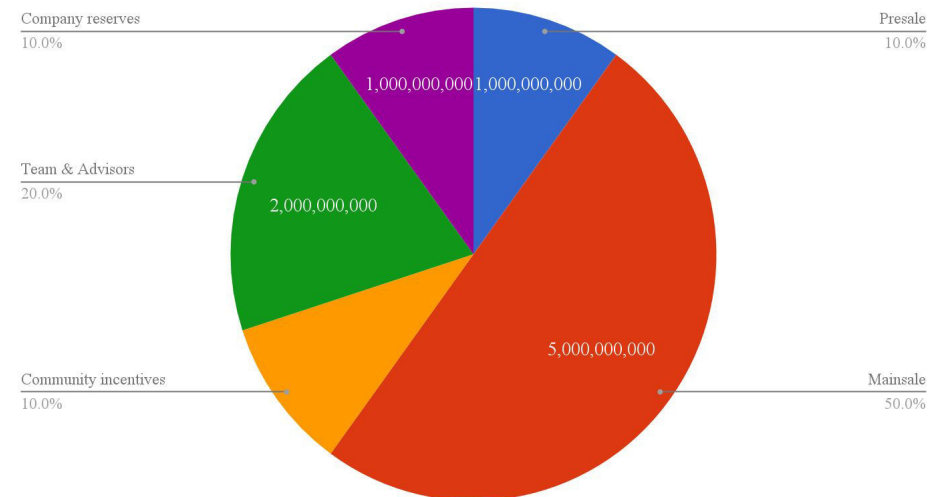
This may undergo slight changes. We are debating the use of stellar (XLM) as an ICO platform due to lower costs, better security and speed.

- Total tokens: **10 billion**
- Type: ERC223
- Token symbol: PIC
- Reserved for community incentives: **1 billion**. These tokens will never be sold by us, they will be given away to the community as incentives

for tasks like user referrals, bonuses, contributing code etc. Used for kickstarting the platform.

- Sold in presale: **1 billion**. Estimated to start Q1 2018.
- Sold in main sale: **5 billion**. Will take place after the primary feature of the platform (betting) is built. Estimated to be early Q2 2018. Will probably be sold in an auction. More details will be released as we approach the event.
- Reserved by the company: **1 billion**. Used by AI agents that take bets from users and for providing margin.
- Reserved for team, founders and advisors: **2 billion**. Locked up and cannot be transferred or sold until Q2 2019.

## Token distribution



## 5.4 Presale mechanics

Accredited investors, non US and Canadian citizens are allowed to participate. Presale will have soft and hard caps and will run for 6 months or until the hardcap is met. We want to give sufficient time for investors to see the project progress and contribute only if they are satisfied with our work, hence the longer than usual presale funding period. However, reaching the softcap goal early allows us to work fulltime on the project and greatly accelerates the progress of the project. Funds will be returned if softcap is not met.

- Total tokens for presale: **1 billion**
- Price per token: **\$0.01**
- Softcap: **\$500,000**
- Hardcap: **\$10,000,000**

It is only fair to incentivize early investors for taking on higher risk. Hence the bonus structure shown in the picture below is proposed. As an example, 1 Bitcoin (prices as of Jan 2018) will give you:

- 1,927,710 tokens at 20% bonus
- 1,758,241 tokens at 10% bonus
- 1,600,000 tokens at no bonus

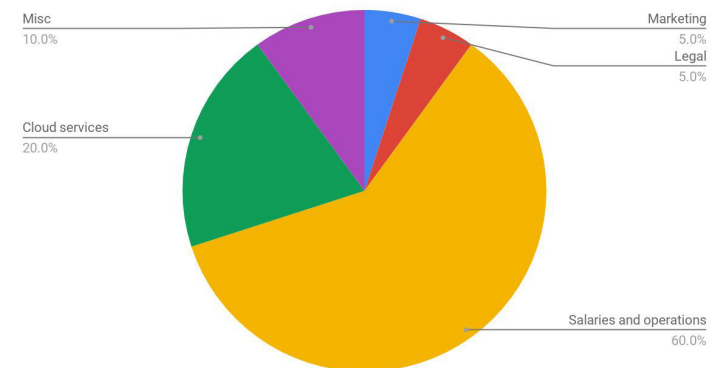
Tokens sold in the presale and the ones earned through contributions on the platform will be available for buying and selling and on the platform itself. This greatly reduces the friction in acquiring tokens for platform uses like betting and purchasing AI trading suggestions. In addition, if we choose the Stellar network as our ICO platform, tokens will instantly be available for trading as it has an inbuilt decentralized exchange.

TOKENS	BONUS	EFFECTIVE RATE	TOKENS DISBURSED	AMOUNT
First 200 million	20%	\$0.0083	240,000,000	\$2,000,000
200 to 500 million	10%	\$0.0091	330,000,000	\$3,000,000
500 to 1000 million	0%	\$0.01	500,000,000	\$5,000,000
			1,070,000,000	\$10,000,000

## 5.5 Usage of funds from presale

Funds raised in presale will be used for the development of the platform. This includes salaries for full-time core developers, operating expenses, paying for cloud services and legal expenses. We plan to grow organically so marketing expenses will be kept to an absolute minimum.

Usage of funds





## 6. Execution

We have come up with innovative ways to execute the project. These methods are partly inspired from the democratic nature of blockchain technology.

### 6.1 Financial transparency

The usage of funds raised in the presale will be audited and made public. Contributors can follow the money trail end to end. Audits will be posted monthly.

### 6.2 Open source development

All our code will be open source (except some cutting edge AI algorithms). This includes smart contracts and code to interact with cloud services. Anyone can contribute code/research/partnerships to the project and earn tokens. These tokens are paid out from the community pool. Our scrum boards will be made public so that interested independent developers can assign tasks for themselves and help accelerate the development of the platform. Contributors in the presale can follow our scrum boards to keep them updated on work progress.

### 6.3 Open marketing

In the same vein as ‘anyone can contribute code’, anyone can become a marketer for the platform and help it grow. Similar to developers, marketers earn platform tokens for their contributions. Tokens earned are directly proportional to several quantifiable actions like the bringing new users to the platform, tweeting, writing blog posts etc.

### 6.4 Campus ambassador program

College campuses are hubs of entrepreneurial activity. They are teeming with students and researchers doing cutting edge research in the fields of AI and

distributed systems. We want to tap into this ecosystem by having platform ambassadors on campus to bring awareness about the work we do in AI. This helps in several ways including attracting the best AI talent to the platform, registering new users, getting product feedback and ideas for new platform features.

### 6.5 Meetups

Meetups are a great way to meet fellow crypto enthusiasts over some free beer and pizza. They also serve as an opportunity to directly hear from the users of the platform about what’s working and what can be improved. We plan to run city specific chapters in major cities like San Francisco, Berlin and New York and community run chapters in other cities.

## 7. Roadmap

The project will be executed in multiple distinct phases. Each phase will have new features, security enhancements and scaling improvements. Below is a high level overview of currently identified named phases.

### 7.1 Euphonium - January 2018

Building the early core team and developing the presale website are the primary goals of this phase. Whitepaper and technical paper are finalized and released. Team composition:

- Backend developer
- AI researcher
- Marketers
- Community managers

### 7.2 Carimba - Q1 2018

Platform development, presale and community building begin in this phase.

Following features of the platform are implemented:

- Registration/Login
- Betting component of the platform
- Token disbursement functionality
- Development of initial AI algorithms

### 7.3 Lyra - Q2 2018

Team is expanded. Main sale starts. Community building continues and following features are implemented:

- Social and informational aspects
- Portfolio betting
- Auto generation of ICO reports
- Interactive AI agent to answer questions

### 7.4 Cithara - Q3 2018

Platform is fully functional as described in our vision (sections 3.1 - 3.4).

These features are implemented:

- Syndicate betting
- AI trading suggestions
- Peer to AI betting

### 7.5 Ocarina - Q4 2018 and beyond

Following features are implemented:

- Completely stabilized platform.
- Continual improvements in terms of features, security enhancements, bug fixes, scaling improvements etc.
- Industry trends are closely watched and the platform is proactively evolved to satisfy market needs.
- New products that are offshoots from the parent platform will be developed to exploit new lucrative opportunities including various derivatives of cryptos like options and other financial products.
- Steps towards complete decentralization of software components will be initiated to make the platform unstoppable and censorship resistant.
- Community building continues.
- Platform to third party developers and financial analysts.
- AI to AI betting is implemented.