



CRYPTO ANGEL

DECRYPT YOUR POTENTIAL | VIRTUAL LIFE GUIDE

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ABSTRACT



PLEASE READ THIS PAPER CAREFULLY. YOU MUST NOT INVEST IN THIS INITIAL COIN OFFERING (ICO) WITHOUT DOING SO!

Technology has transformed the way we work, play and do business. It has provided new solutions to old problems, disrupted traditional business models and helped us become more efficient. The speed and scale of this change are not abating. New developments are still being introduced and applied – and this creates a significant benefit (dividend) for world economy. This growth will be underpinned by new technologies. One of these is distributed ledger technology and its most common application – blockchain, and the other is artificial intelligence.

Artificial intelligence has made rapid advances in the last decade, due to new algorithms and massive increases in data collection and computing power. Evolving software algorithms, capable of performing tasks typically requiring human intelligence, are fueling a wave of advancements in visual perception, speech recognition, decision-making, language translation, robotics and autonomous vehicle capability. Machine learning and deep learning are garnering the most attention as they teach themselves to learn reason, plan and ultimately become more intelligent when exposed to bigger, more refined data sets and a standard predictive analytics model.

On the other hand, with blockchain, we can imagine a world in which contracts are embedded in digital code and stored in transparent, shared databases, where they are protected from deletion, tampering, and revision. In this world every agreement, every process, every task, and every payment would have a digital record and signature that could be identified, validated, stored, and shared. Intermediaries like lawyers, brokers, and bankers might no longer be necessary. Individuals, organizations, machines, and algorithms would freely transact and interact with one another with little friction. This is the immense potential of blockchain.

Ultimately, we are still only at the initial stages of exploring the potential of this technology, but already it is showing many benefits. As the technology becomes more embedded and efficient, the full extent of its applications and implications will emerge. This will be particularly evident as it is combined with other emerging technologies. As additional uses for the technology emerge over time, the full potential of the blockchain and artificial intelligence – and the opportunities it offers to businesses and individuals – will be revealed.

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1. EXECUTIVE SUMMARY

CryptoAngel is a virtual life assistant based on a powerful AI models, that works on an individual input, and outputs the best model that suits particular user needs. Imagine Cortana, Alexa and Siri but way more scalable, intelligent and powerful. The ecosystem is blockchain based, where the developers can upload their models for training and processing in decentralized manner. The goal is to have one central intelligent model called Master-Mind whose possibilities will be limitless. CryptoAngel will have mobile app where you can set your personal goal and the Master-Mind will recommend you the best options for reaching your goal. The ecosystem is beneficiary for all the parties involved, developers will be rewarded based on the performance on their model, end users will pay Angel for the model that achieves their goal. Also, the “miners” that will help the processing part of the models will be rewarded accordingly. Nowadays we have many virtual assistances and chat bots but they are domain restricted and black boxed and their performance is limited. CryptoAngel will have the potential to become one of the most powerful AI virtual guides that will be capable of understanding your problems and predict your intentions. Alternatively, there will be possibility of data monetization, all the models will be ranked accordingly to their performance so if someone wants to use your model he can rent or buy it. Furthermore, the data needed for training the AI models can be valued and sell for future data mining task or evaluation.

2. INTRODUCTION

AI is a fast-paced field with a deep history that is continuing to change and become more complex every day. But what some don't realize is that the AI of today is no longer the AI of the past. AI now has the power to address challenges and predict outcomes like never before – but taking advantage of the opportunity requires understanding where we've been, where AI is going and how to keep pace with this fast-changing industry.

In recent years, AI researchers have finally solved problems that they've worked on for long, from AlphaGo to human-level speech recognition, and AI is finally starting to deliver real-life benefits. The ingredients for a breakthrough are in place. Computer power is growing significantly, algorithms are becoming more sophisticated, and, perhaps most important of all, the world is generating vast quantities of the fuel that powers AI—data. Billions of gigabytes of it every day. Big data has transformed AI, to an almost unreasonable level.

In the past, AI's growth was stunted due to limited data sets, representative samples of data rather than real-time, real-life data and the inability to analyze massive amounts of data in seconds. Today, there's real-time access to the data and tools that enable rapid analysis. This has propelled AI and allowed the transition to a data-first approach. Our technology is now agile enough to access these colossal datasets to rapidly evolve AI, machine-learning and deep learning applications.

2.1 AI - How does it work?

AI, in broadest sense, is simulation of human intelligence processes by machines and computer systems. These processes include: learning, reasoning and self-correcting and improving. AI can interact with the environment, perceive it, and take actions that are going to maximize its chances to succeed at some goal. Through advanced, human-like intelligence — courtesy of



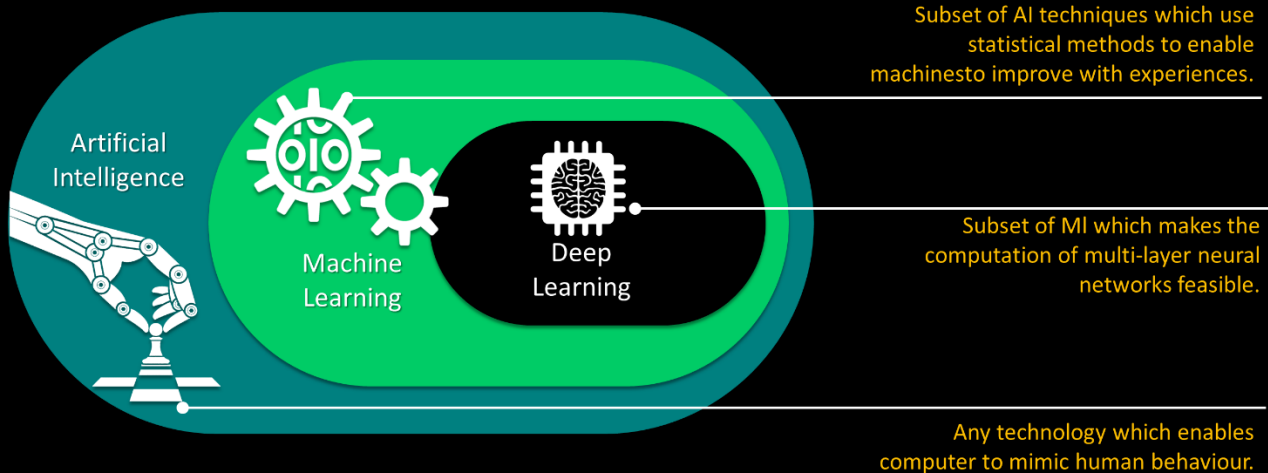
software and hardware — an AI machine or device can mimic human behavior or perform tasks as if it were human, or even better in some cases.

Today, we read a lot about AI regarding things like speech recognition (used by intelligent personal assistant devices), facial recognition (used by popular filters in social media), or object recognition (like searching for images of apples and oranges).

Machine learning is the subset of Artificial Intelligence with an emphasis on “learning” rather than just computer programming. The idea behind machine learning is the following: In order to “simulate” complex systems (like human intelligence for example), traditional approach would be to write a computer program that simulates the behavior of such systems. Machine Learning take another approach, and that is to provide a lot of data (examples for the specific problem AI is supposed to solve) and let the program write itself, meaning let the AI model the logic behind the data presented and formulate “thought process” that achieves a certain goal.

Here, a machine uses complex algorithms to analyze a massive amount of data, recognize patterns among the data, and make a prediction — without requiring a person to program specific instructions into the machine’s software.

Deep learning, a subset of machine learning, takes computer intelligence even further. It uses massive amounts of data and computing power to simulate Deep Neural Networks. Essentially, these networks imitate the human brain’s connectivity, classifying data sets and finding correlations between them. With its newfound knowledge (acquired without human intervention), the machine can then apply its insights to other data sets. The more data the machine has at its disposal, the more accurate its predictions will be.



2.2 Machine learning

Machine learning is a subfield of artificial intelligence that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can learn for themselves, given the collection of examples (data) and the goal that needs to be met.

Machine Learning is divided into supervised learning and unsupervised learning. In supervised learning label data is given to the machine, which then uses this data to build the model of it and use it on newly seen data to make predictions or label them. The example of this is image recognition, where machine can learn how to recognize images and output what it sees (for example: is it a dog or a cat). In order to build a model, we need to provide it with a lot of training images of dogs and cats (explicitly saying this is a dog, that is a cat). The other technique is unsupervised learning, and it operates on raw data (not labeled), and is able to find hidden patterns or anomalies inside the dataset, or it can be used to split into clusters of similar point.

The process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the provided examples. The primary aim is to allow the computers to learn automatically without human intervention or assistance and adjust actions accordingly.

Machine learning is a core sub-area of artificial intelligence; it enables computers to get into a mode of self-learning without being explicitly programmed. When exposed to new data, these computer programs are able to use this knowledge to perform certain tasks (like predictions, classification, anomaly detection etc.), but also improve themselves. There is a whole sub-field of machine learning called reinforced learning, with a focus on improving the processes driving the decision-making tasks, using experience.

Machine Learning algorithms iteratively learn from data, thus allowing computers to find hidden insights without being explicitly programmed where to look. Machine Learning is essentially teaching the computer to solve problems by creating algorithms that learn by looking at hundreds or thousands of examples, and then using that experience to solve the same problem in new situations.

Machine learning is a data analytics technique that teaches computers to do what comes naturally to humans and animals: learn from experience. Machine learning algorithms use computational methods to “learn” information directly from data without relying on a

predetermined equation as a model. The algorithms adaptively improve their performance as the number of samples available for learning increases.

Machine learning algorithms find natural patterns in data that generate insight and help you make better decisions and predictions.

2.3 Deep learning

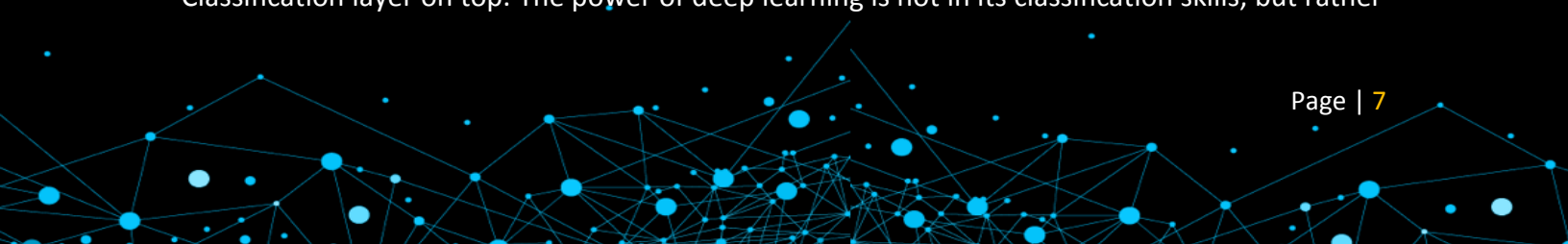
Deep learning is a particular kind of machine learning that achieves great power and flexibility by learning to represent the world as nested hierarchy of concepts, with each concept defined in relation to simpler concepts, and more abstract representations computed in terms of less abstract ones.

It is based on neural networks, which are the artificial representation of human brain. Neural networks are composed of artificial neurons layered in many levels and interconnected resembling the structure of our brain. These neurons and connections between them are configured in the training phase based on the dataset given to it.

One of the great challenges of Machine Learning is feature extraction where the programmer needs to tell the algorithm what kinds of things it should be looking for, in order to make a decision and just feeding the algorithm with raw data is rarely effective. Feature extraction places a huge burden on the programmer especially in complex problems. The algorithm's effectiveness relies heavily on the skill of the programmer. Deep Learning models address this problem as they are capable of learning to focus on the right features by themselves and requires little guidance from the programmer, making the analysis better than what humans can do.

Deep learning refers to artificial neural networks that are composed of many layers (called hidden layers). The 'deep' refers to multiple layers. In contrast, many other machine learning algorithms are shallow because they do not have a Deep architecture through multiple layers. The Deep architecture allows subsequent computations to build upon previous ones. We currently have deep learning networks with 10+ and even 100+ layers.

The presence of multiple layers allows the network to learn more abstract features. Thus, the higher layers of the network can learn more abstract features building on the inputs from the lower layers. A Deep Learning network can be seen as a Feature extraction layer with a Classification layer on top. The power of deep learning is not in its classification skills, but rather



in its feature extraction skills. Feature extraction is automatic (without human intervention) and multi-layered.

Deep learning is especially effective in image recognition, which is due to its ability to extract and abstract features. For example recognizing a face in a photo has many layers of recognition: recognizing eyes, hair, ears etc., and this is where deep neural networks excel.

The network is trained by exposing it to a large number of labelled examples. Errors are detected and the weights of the connections between the neurons adjusted to improve results in the process called backward propagation. The optimization process is repeated to create a tuned network. Once deployed, unlabeled images can be assessed based on the tuned network.

Deep Learning models have been very effective in complex tasks, such as sentiment analysis and computer vision. However, Deep Learning algorithms, due to their slow learning process associated with a deep layered hierarchy of learning data abstractions and representations from a lower-level layer to a higher-level layer, are often prohibitively computationally-intensive.

3. PROBLEM OVERVIEW

Training a deep neural network is extremely expensive, computation wise, and it requires huge amounts of data. So, in order to build an effective deep neural network, it often takes a week to train it using hundreds of machines equipped with expensive GPUs.

So, unless you are Google or Facebook, the infrastructure needed to build a great performing deep learning model is not available for you. One of the solutions would be to resolve to one of the cloud computing platforms, which are usually very costly (around 0.74\$/hr per GPU).

The other problem that was already mentioned is where to get such a huge dataset used for training this model. These datasets are usually not publicly available, and are in possession of companies and institutions who gather them on various ways.

With all of these arguments previously stated, we can conclude that the current Machine Learning applications are very limited and often they only benefit huge companies who possess the resources needed to implement such technologies. There is a need to democratize and decentralized AI, meaning give access to these resources to everyone who has the skills and knowledge about these topics, and only in this way AI can advance to the next level.

3.1. AI democratization

With deep learning breaking new ground in areas like speech and image recognition, those at the front lines of AI research are keen to point out that there's still a lot of work to be done. Just because we have digital assistants that sound like the talking computers in movies doesn't mean we're much closer to creating true generalized artificial intelligence. Problems include the need for vast amounts of data to power deep learning systems, and our current inability to create AI that is good at more than one task. Artificial intelligence needs data to learn, and it requires hundreds of thousands of times more information than humans to understand concepts or recognize features.

Application domains where deep learning is successful today are those where a lot of data can be acquired, such as speech and image recognition. Big tech giants (like Google and Facebook) have access to mountains of data (for example, your voice searches on Android), making it much easier to create useful tools. Facebook and Google initially used the data they collected from users to target advertising better. But in recent years they have discovered that data can be turned into any number of AI or "cognitive" services, some of which will generate new sources of revenue. These services include translation, visual recognition and assessing someone's personality by sifting through their writings—all of which can be sold to other firms to use in their own products.

These firms are always looking for new streams of information. Facebook gets its users to train some of its algorithms, for instance when they upload and tag pictures of friends. This explains why its computers can now recognize hundreds of millions of people with 98% accuracy. Google's digital butler, called "Assistant", gets better at performing tasks and answering questions the more it is used. Also, Google and Facebook are using AI to improve their targeted advertising, and Amazon is using AI to improve its highly profitable cloud computing business.

This abundance of data changes the nature of competition. Technology giants have always benefited from network effects. By collecting more data, a firm has more scope to improve its products, which attracts more users, generating even more data, and so on.

Most important, the value of data is increasing and all the dynamics of data ownership is amplified when AI enters the equation leading to virtuous cycle - more data means better machine and deep learning, which means better services and more users, which means more data. As one AI company takes a significant lead over competitors, these dynamics are likely to propel it to an increasingly powerful position.

So why is it important to democratize machine learning? There are many persuasive reasons for democratizing AI. Knowledge and information both increase value when shared. At this point in the technological revolution, it's not just important – it is necessary to democratize AI.

First, because machine learning and artificial intelligence have tremendous potential for value creation, and we should not let any of that potential be centralized. In terms of improving the technology, research cannot be done in the shadows and will greatly benefit from having more people engaged in research. People with the passion and expertise required to advance the field of AI or to use AI to create great products can come from anywhere. We want to ensure these people can readily access the knowledge and tools they need to make their contribution to the field of AI, and to inspire capable people all over the world to dedicate their talents to value creation through AI. AI is about to create a fantastic amount of opportunities, and these opportunities should be open to all.

The other reason, perhaps subtler, is that we should make AI accessible for the sake of social and economic stability. It should help to distribute the profits from AI. In the near future, AI will automate many jobs, and much of the value created by AI will be received by those who develop it which would lead to massive wealth inequality. One way to counterbalance this is to make value creation through AI as broadly available as possible, thus making economic control more distributed and preventing a potentially dangerous centralization of power. If everyone can use AI to solve the problems that they have, then AI becomes a tool that empowers individuals. If using AI requires contracting a specialized company (that will most likely own your data), then AI becomes a tool for the centralization and consolidation of power.

But access to data is only one way in which AI is being democratized. There is an effort underway to standardize and improve access across all layers of the machine learning stack, including scalable computing platforms, software frameworks, tools and ML algorithms.

3.2. Computing power

Limiting factor in developing machine learning algorithms is computing power which is required to train modern AI algorithms. Cloud compute could provide the answer in the short term, but as data volumes continue to grow, and deep learning drives the automated creation of increasingly complex algorithms, the bottleneck will continue to slow progress.



Blockchain technology, which underpins the second generation of the Internet, will significantly improve the efficiency of supercomputing. It enables the capability to integrate computational power across systems and thus produce supercomputing that is faster and cheaper.

The answer is likely to lie in the development of the next generation of computing infrastructure carry out operations on data far more quickly than today's computers. This distributed memory architecture allows AI models to run over many nodes to accelerate the training of AI algorithms. We think that a distributed processing approach on industry-standard servers is clearly the future for AI.

Given the computing infrastructure provided by the blockchain, there are various options for everyone to train highly sophisticated Machine Learning algorithms. One of the mostly used open source frameworks for Machine Learning, TensorFlow (developed by Google) has the support to run your algorithms on a distributed clusters in order to speed up the training phase.

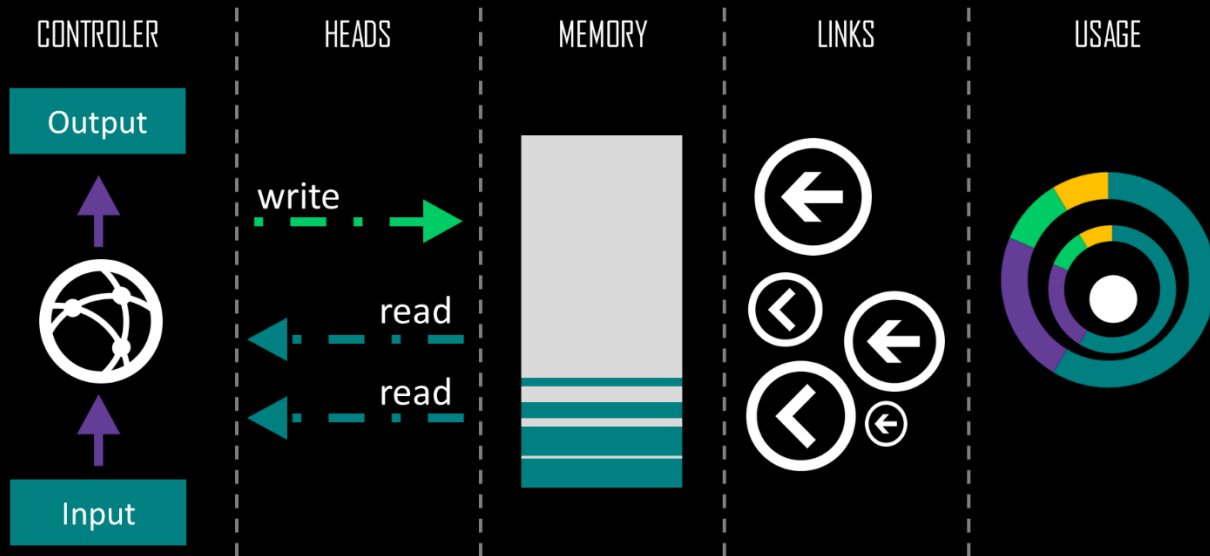
Large companies like Google, Amazon, Facebook and Apple have access to the massive data and computing resources needed to accomplish such tasks. Small startups and individuals simply didn't have access and were effectively blocked out of the market until recently.

3.3. Generalized AI

Many experts have defined the ability to generalize learning as one of the differences between how a neural network attacks a learning problem versus how a human does. Humans possess the ability to apply models they have learned from one task to a second, previously untried endeavor. For instance, the first time you learned to whisk eggs, you could subsequently apply that knowledge to whisking cream, or any other whisking-based endeavor. Not so for a deep neural network, which needs to be trained anew for each activity. An AI that can generalize between learned activities could use its vast storehouse of learned models to attack any new activity with a level of sophistication only dreamed of by humans. Blockchain could be the missing link in AI achieving high levels of generalization, since it can democratize it, provide shared computing resources and generally build a whole ecosystem around it, where users share dataset, train models and use them, while also improving the central, common AI at the same time. The common AI can use existing models and reuse them for different tasks, and it can also learn from them and generalize on the higher level of abstraction that the models built by users of the network.

Differential Neural Computer (DNC) which was also used on AlphaGo, relies upon a high throughput external memory device to store previously learned models, combined with a system for generating new neural networks based upon the archived models.

DNC ARCHITECTURE



3.4. Conclusion

Market-based access to data and algorithms will lower entry barriers and lead to an explosion in new applications of AI. The democratization of AI will give individuals a chance to get their ideas off the ground and prove their concepts quickly and at the fraction of the cost. To achieve that goal, we will provide an on-demand infrastructure needed to build and run ML algorithms, open-source frameworks and datasets to encourage developers, and marketplaces for the algorithms and models themselves.

4. ABOUT THE PROJECT

We are excited about the potential of AI to transform our world in amazing new ways. We are working on a broad business ecosystem to accelerate the development of new technologies and solutions that will make game-changing AI capabilities accessible to a broad community. Our vision is the democratization of AI - a shift that will transform and change our society in fundamental ways.

We also believe blockchain provides underlying technology for planetary-scaled decentralized AI, offering a possibility of creating business ecosystem that will accelerate development of AI, leading to data sharing and consequently better models and merge data silos into qualitatively new data sets.

CryptoAngel project aims to provide business ecosystem which will accelerate development of generalized and democratized AI in decentralized manner. Business ecosystem is encompassing several crucial participants that drive organic growth of our AI application, where value is exchanged by means of Angel cryptocurrency. CryptoAngel will provide a framework as a tool for external users to build AI models, provide data training sets and to contribute to the development of what we call Common AI in return for Angel cryptocurrency. Common AI is the brain of our internally built system crowdsourced by external domain (subject matter) experts. It is decentralized application consisted of neural networks i.e. AI models, and logically divided into subsets of categories where each category has value for end user. One model can be found in several categories.

Our mission is creating worlds decentralized brain by interconnecting all crucial AI market drivers into business ecosystem backed by our cryptocurrency.

We are aiming to build environment that is smart to understand your intentions, in some cases predicting them before you even become aware of them. Our idea is putting intelligence on the blockchain, or more specifically, using blockchain architecture to instantiate thinking machines. We are focusing on AI's assistive role, emphasizing the fact that it is designed to enhance human intelligence, it is the idea of a system that supplements and supports human thinking, analysis, and planning, leaving the intentionality of a human actor at the heart of the human-computer interaction.

End user will interact with our technology through mobile application. Our application is AI-powered "consultant", virtual advisor which is super smart, interactive and has the answer to almost every question and problem one person is facing around the world. Users will be able to get prompt response for their everyday questions but also to set long term goals and interact with the application to achieve it in due time.

CryptoAngel leverages AI technologies, P2P technologies, cryptography, blockchain, and the economic drivers to create world's first decentralized, generalized and democratized AI application.

CryptoAngel's business model is a marketplace for categories of AI models, with a supply and demand side.

The supply side of our business model allows external AI developers to contribute to the development of categories of knowledge which will be offered to users of our AI mobile application.

The demand side of our business model is driven by usage of our mobile application. It provides generalized AI technology with wide variety of default features and possibility for end user to buy additional categories of knowledge using Crypto Angel currency, which is then distributed to all developers that contributed to the development of bought category.

4.1 Project objectives

The Crypto Angel Company is a non-profit organization that is responsible for the creation, management and distribution of the CryptoAngel token. Its operations will include creating future products under the Crypto Angel copyrights. All the profits received by the Crypto Angel

Company will be utilized for further development of CryptoAngel products in order to increase the value of CryptoAngel token.

Crypto Angel has 3 main objectives:

1. To democratize AI by onboarding broader community to be part of development process of “Common AI”
2. To make generalized AI application that offers comprehensive knowledge that is continuously learning
3. To make marketplace where end user can buy various categories of knowledge

Since decentralized applications utilizing blockchain technology are still at the beginning of their development we believe that the most critical component of such application’s success is the community which is motivated enough to support it. This is why our incentive model will be set to favor early adopters, offering them to benefit from their early dedication to our values. As early and late majority joins the ecosystem over time, incentive model will start to decline following the pace of entire system economics.

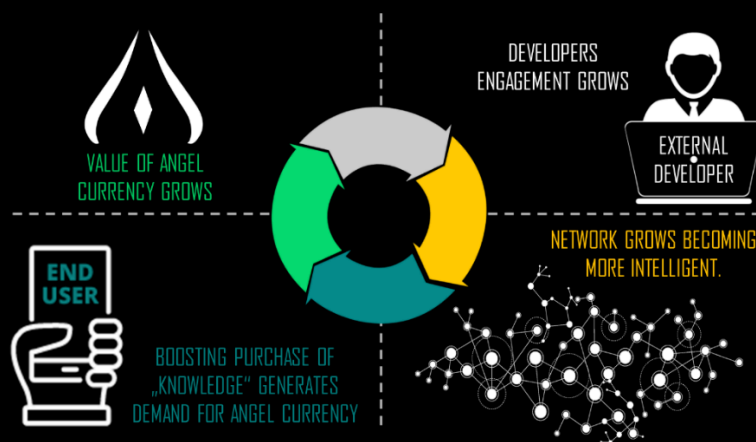
CryptoAngel platform will interconnect following participants:

- Data providers - owners of datasets who will be incentivized by our cryptocurrency to provide their datasets to be part of our big data training pool. We will set specific requirements for data sets through our portal, those requirements will come from classes of AI models designed for specific domains of problem.
- External developers - AI developers who will submit their AI models to be part of Common AI in return to Angel cryptocurrency (more details in 4.2).
- Miners - create decentralized blockchain consensus, mining with proof of intelligence algorithm (described in 4.4.7) to train AI models and verify computations in CryptoAngel blockchain network. Miners will invest their computation power to receive remuneration in Angel currency.

CryptoAngel aims to capture most of the value from the market with its innovative approach of computing AI models. Our strategy to capture the value from the market is to attract key players by differentiating our core economic levers and offering them possibility to enter new revenue streams: miner can sell their computing power for AI model training, developers will benefit from their ML models bundled in superset of AI models offered on global market, data providers will benefit from their datasets.

4.2 CryptoAngel ecosystem

CryptoAngel ecosystem is driven by market incentive mechanism which will enable us to accelerate progress and propel democratization of deep learning. CryptoAngel ecosystem is created in such manner that all the participants function independent of each other while remaining connected through CryptoAngel value chain. Competitive setup of ecosystem drives participants to compete among themselves to deliver the best asset i.e. the most value to the CryptoAngel platform. In this way CryptoAngel is offering scalable system calibrated to incentivize all participants in the chain and manage its performance through compensation model.



Our platform, crowdsourced by AI domain experts and combined with carefully designed incentive structures will lead to organic and sustainable growth of the system itself. Having in mind network effects, meaning that increase in usage leads to direct increase in value, network effects of the CryptoAngel platform will drive this growth. One of the most challenging business tasks the project needs to respond is finding the economical upward trajectory and finally equilibrium where incentives driving network effects, costs associated with growth (more data leads to higher storage costs) and finally quality of AI models (model output is not linear function of data quantity) are aligned together in competitive environment. We will use Nash equilibrium criterion to achieve stable state (equilibrium) where participants contribute to platform's growth and pursue their own economic interests at the same time.

External Developers CryptoAngel is open source deep learning framework which enables AI developers to directly create deep learning models. It is Python-based library but also supports other languages, like C++ and R. CryptoAngel is compliant with the most popular frameworks in

AI community including TensorFlow, Caffe and Torch, so AI models created using these frameworks can smoothly run on our system, in that way providing developers with convenience of using AI framework of their choice.

Developers can train their ML models on a distributed network by using the computing power of other machines in it. After the model is trained, it can be stored in a blockchain in a distributed marketplace of ML models and algorithms. Since ML models are usually quite large, they will be distributed over the blockchain and the miner can be rewarded also for putting the models back together. Another advantage of having such a marketplace based on the blockchain is that the models can't be tampered with, and they stay immutable, which is especially important for users that use these models for critical decision making. Smart contract will also improve the distribution of datasets which often have a lot of legal prerequisites that need to be satisfied in order to be used.

Each external developer is independent and can provide AI model and initial training set through our web portal. Developer is rewarded with Angel cryptocurrency if output of his model exceeds predefined output threshold, which is measured once process of model training is finished. Furthermore, his model becomes integral but modular part of Common AI application. In case that such model already exists, outcome of trained model must over perform the existing one to be included in Common AI. Building two different AI models for the same domain of problem is not mutually exclusive, meaning that developers are encouraged and incentivized to provide better models than existing ones. In this way we are enabling healthy competition which leads to qualitatively better models to respond on specific given task.

In order to protect our system from low quality, deliberately intended-to-harm, AI models we will introduce small fee as a developer's commitment to provide appropriate AI model.

Before model becomes part of Common AI, it is passed through the process of training. Once this process is finished, output is measured against the upfront set threshold (or with output of current model if exists) and, in case of success, model is becoming part of Common AI, and developer is rewarded with Angel one-off fee.

Developer's AI model (i.e. neural network) is consisted of inputs it expects to receive for specific domain of problem the model is responding to. Our system is mapping those inputs into the requirements needed for extensive model training, refining training matrix for particular model training and adjusting requirements for additional data sets if needed.

Data providers Qualitatively good data is of critical importance for our ecosystem success, so beside our internal efforts to ensure data from already available sources, we will onboard data providers to the process of providing data sets for models training. Each time AI model is

successfully trained by data provided by particular data provider he will be rewarded by certain number of Angels. There will be several connections through which data can be provided.

- Data providers will be able to load required data training sets through our data supply portal.
- The mobile application itself will have an option to run in an advanced mode collecting behavioral patterns of customers using it.
- There will be connector for IoT based data input streams, collecting data from various sensors, from connected cars to smart home solutions.

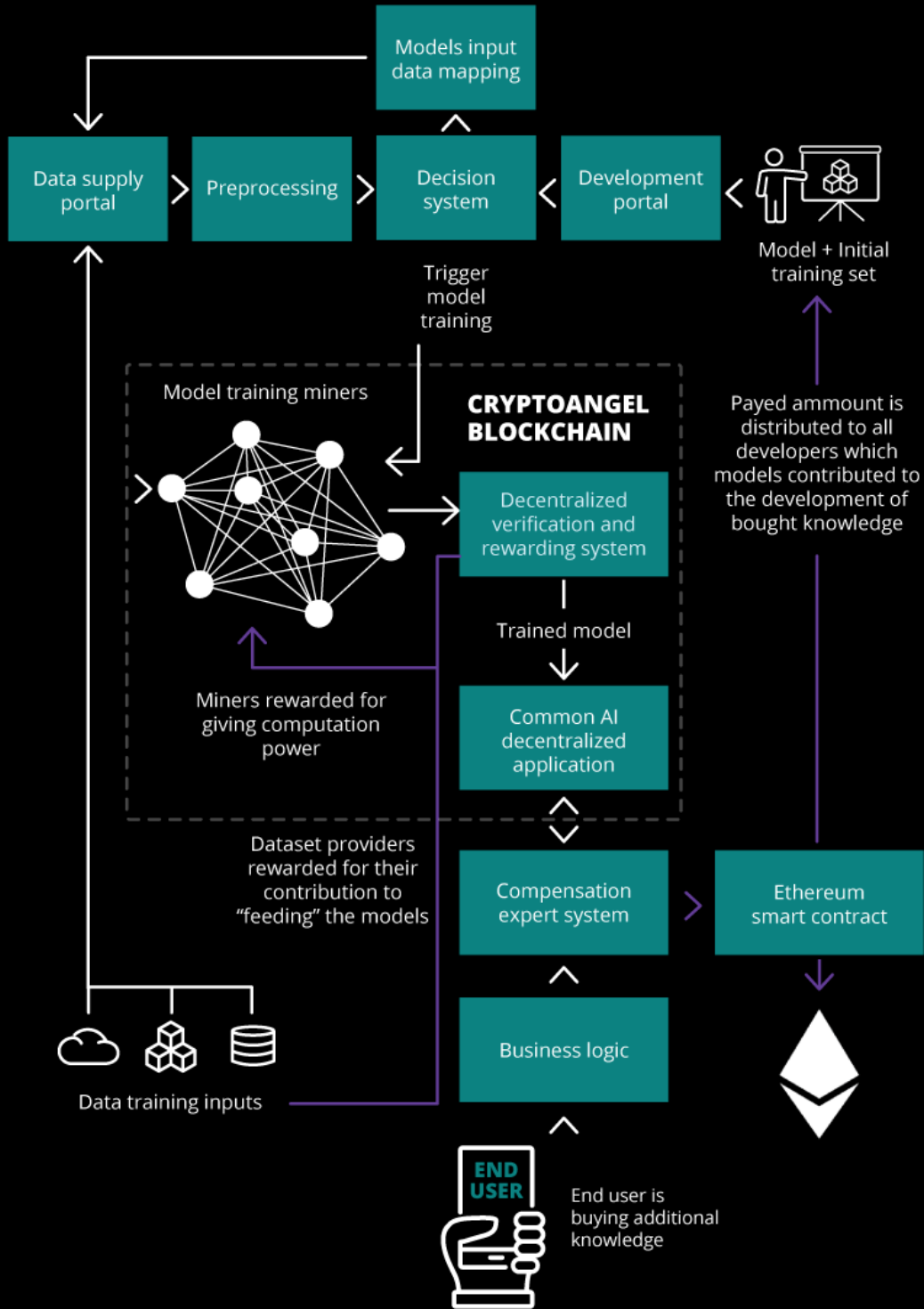
In order to protect our system from low quality datasets and AI models we will introduce a stake mechanism with moderate entry barrier as provider's commitment to submit appropriate input. Also, we will introduce validation process for both datasets and models. Validation logic will take already computed (computationally validated) AI models, divided per domains of problem they are developed for, and data sets for each of those models as a reference point for all other submissions. That is, we will train reference model with submitted dataset, and compare result with output of reference AI model trained with reference data set, and if result satisfies given criteria dataset will be included in dataset pool. Same logic will be applied for AI models. Output of submitted AI model will be trained with reference data of counterpart reference mode and if output of submitted model satisfies upfront set criteria it will be included into the pool of AI models and be subject of further analysis and training process.

Decision system, which is part of our platform, maintains the logic for triggering model training. The system is extracting, transforming and loading processed and normalized data into smaller subsets of training data. Those subsets together with a model are propagated to the 'miners' who are investing their computational power to train models in return to Angel cryptocurrency.

4.3 Functional architecture

AI and blockchains are complementary and synergistic, and AI can add intelligence and insight to decision making process. Blockchain, in its role, adds integrity, assurance and decentralization to the core transactional environment and can help enormously in process improvement. While AI helps us assess, understand, recognize and decide, blockchains can help us verify, execute and record. While the machine learning methods can help us find opportunity and improve decision making, smart contracts and blockchains can automate verification of the transactional

parts of the process. The objective is to formulate intelligence as a blockchain process, which could have benefits for both enhanced human biological thinking, and artificial intelligence.



The Angel cryptocurrency is based upon the ERC20 Ethereum network protocol. Business logic is developed in decentralized manner using Ethereum smart contracts.

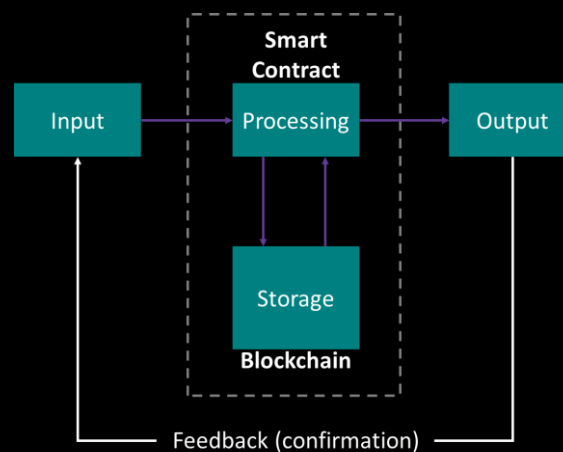
CryptoAngel uses IPFS for storing models. Each time model is submitted to the CryptoAngel network it passes already described process of validation. Once model is successfully validated new smart contract is created which consists hash of the model uploaded to IPFS. Our business logic maintains which model i.e. which hash will be used as a part of Common AI application.

CryptoAngel leverages decentralized mechanisms provided by Ethereum protocol, which will be utilized to set business logic to incentivize all participants of our market driven architecture.

Incentivization (compensation) logic is hierarchical smart contract framework consisting of X connected smart contracts.

All datasets and models can be uploaded via the IPFS protocol whose hashes will be utilized by Ethereum smart contracts.

Crypto Angel is outlined as an input-processing-output computational system. CryptoAngel AI ecosystem is a framework where there are inputs which are processed and turned into outputs.



The inputs are brought into a Data supply portal for processing. The outputs might include taking an action, storing something back into memory, send notifications to users via CA mobile app or into system or smart contracts, conducting a transaction, or making a note or trigger for some sort of future action.

Our Data supply portal will include life logging plugins to capture and safely encode all individual's activities, behaviors, habits, opinions, and subjective experiences and build "personal mindset data file" onto blockchain as a large-scale coordination mechanism "Mastermind" (model of all models) for the integrated data analysis of individuals and populations.

In Crypto Angel's Ecosystem of millions of mindset data files living and thriving in Angel's smart chain network. Angel's blockchain will be used as a secure large-scale data management mechanism to coordinate information of millions of individuals.

The files are not literally stored on the blockchain, but blockchain-registered transactions provide a unique ownership signifier and include pointers to the files which are stored securely in decentralized off-chain locations.

Data will be easily and securely recorded to personal mindset data files. Dataset inputs will make to Crypto Angel central intelligence through life logging plugins, which will track user online activities. Mindset data files will include recording of every “action” in the sense of capturing all activities and habit and subjective experiences of people's life, encoding and archiving this activities into Crypto Angel’s Decision system for further processing.

Personal mindset data files management will be realized in a few simple steps. The first stage is assembling a ‘digital you’ from automated deep-learning algorithms. Mindset files will be assembled from the online presence of individuals.

The next stage is enabling the ‘digital you’ file, initially for guided operations, and with expanding levels of approved autonomy.

Syncing the experiences and knowledge from millions of personal mindset data files to CA central intelligence called “Mastermind” will be realized through specific processing algorithms for which blockchain concepts and architectures is well- suited, such as hashing security and versioning control.

Personal mindset files will be just like any other smart contract running on the blockchain, with the checks-and-balances and code-based validation features that apply to all smart contracts. Crypto Angel will be used not only to orchestrate digital mindset files in the present, but also be an important management tool for the future.

Blockchain-based smart contracts have the unique and valuable property of being able to serve as your independent future advocate in uncertain, unknowable, and unpredictable future time frames. You can specify the desired goal in CA mobile app which will trigger CA central intelligence (mastermind) to advocate on your behalf in the future.

In the case of digital mindset file uploads, smart contracts on the blockchain are exactly the kind of third-party advocate that can verify and exercise control over the physical parameters of your reality, of your existence as a digital intelligence.

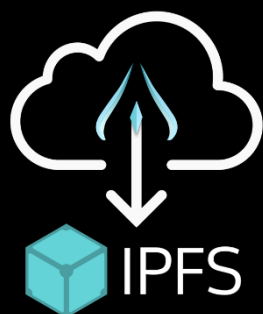


4.4 Blockchain architecture in CA Central intelligence system (Mastermind)

Three areas in the CA blockchain thinking architecture of input-processing-output are outlined: memory, storage, and processing; and utility functions and output. Perhaps the first and most straightforward element needed for thinking is memory. For blockchain computational purposes, a position can be articulated that each memory is a discrete unit and that these discrete units are encoded and stored somewhere.

4.5 INPUT: Memory, Storage, File-Serving

4.5.1 IPFS



IPFS Crypto Angel will use Inter Planetary File System (IPFS) protocol, to create a content-addressable, peer-to-peer storage. IPFS is blockchain-based functionality that is particularly relevant to the implementation of blockchain intelligence. IPFS is a project that envisions a global peer-to-peer file-serving system using the versioning functionality of Github to affirm file content, and the hashing and unique identifier functionality of blockchains to confirm file provenance. The architecture of the Internet has been such that files were typically stored in just one place, unless already slotted for high traffic and shared download, and every call to the file would serve it from a specific storage location. Once called to be served, the file would be packetized per Internet transmission protocols, and these packets transmitted across the Internet and reassembled at the end destination. BitTorrent was one first change to this process by implementing a peer-to-peer serving architecture. Here, there is a directory service of the locations of different instances of a file, such that different packets from the file might be served from different locations on a peer-to-peer basis, and as usual reassembled at the destination.

The innovation made by IPFS takes advantage of the same peer-to-peer file-sharing capabilities of BitTorrent, but in a wider use case, and with expanded functionality. Anywhere any file exists on a network-attached computer could be a serving peer for anyone requesting it. Any digital asset could be logged in a blockchain, including as part of the automated process of uploading or transferring a file or otherwise making it available, thus acquiring a unique signifier or record for that file.

In the context of developing Crypto Angel's central intelligence system, the idea would be to implement memory as an IPFS system. Blockchain would be an always-on accessible memory augment, predictively and in real-time looking up and verifying memories. One huge under-realized benefit of blockchains thus far is the ability to verify and authenticate both users and information in real-time. The first step in building a Crypto Angel's central intelligence would be instantiating a blockchain-based memory system. Every memory could be tagged, addressed, and registered on the blockchain for easily validated lookup at any later moment. Smart memory is exactly analogous to the idea of smart property as registering all assets on the blockchain with their own uniquely identifying indicator, a cryptographic address, for later activation and transfer.

Smart memory would similarly log all individual's ideas, activities, habits, opinions, and subjective experiences, and Deep-learning and other algorithms will be used to assess optimal architectures for Crypto Angel's central intelligence, like the location, separation, and latency specific memory nodes, and overall how many memory copies are needed, and their nature and kind.

The idea is an IPFS implementation for memory: distributed decentralized memory with multiple copies of files served peer-to-peer in real-time on demand. Essentially a GitHub for memory,' this feature would allow all previous versions of a memory, idea, or data element to be tracked over time and retrieved and analyzed on demand. First benefit is provenance, confirming that the file, that memory, has not been hacked, and is still the exact contents of a previous date-time stamped moment. The idea of IPFS is not merely versioning, but versioning in an easy-to-use format like GitHub that both captures the versioning automatically whilst in process so the contributor (ideator) does not need to think about this administrative function explicitly, also such that the easy-to-use web-based platform makes it easy to assess changes between versions and how ideas developed. The idea is Github on the blockchain; an easy means of calling and confirming certain unitary ideas but also whole codebases or ecologies of ideas and memories in the Crypto Angel's central intelligence context. Merkle trees could be used to hash a whole corpus or mind state into one file. What would it be like to have your whole personality recorded in a Merkle tree? Hashing and Merkle trees are an important tool that could be used later in situations such as confirming the fidelity of digital mindset file

uploads; that all the human ideas, activities, habits, opinions, thoughts, and experiences were adequately received into digital format.

Another benefit of versioning could be using it as an introspection tool in the process of idea generation. More explicit versioning could allow the possibility of seeing how ideas are developed; a sort of idea-generation in the wild tracking capability, to see how ideas emerge and are developed. Just like Github shows the historical record of how a software corpus developed over time, so too blockchain thinking could demonstrate how ideas develop over time.

One claim is that humans are special and unique, and defy implementation in computers, not just because of irrational behavioral foibles, but because of ingenuity - independent thinking, new idea generation, creativity, spontaneity, serendipity, and free will. Crypto Angel's central intelligence will be used to explore human ingenuity more specifically. Ingenuity will be articulated in greater detail, so that it could be catalyzed and facilitated, both in the classical real-life environment of human-based intelligence, and in Digital Thinkers. It will be easier to obtain a more granular characterization of the architecture of ideas, and their development, propagation, interaction, and retirement.

Benefit of having the whole of a whole of the person's personality on the blockchain (and by extension the whole of a society's thinking on the blockchain) will be running algorithms over it for patterns and consistency. Blockchain-based memory will be used as an input for the algorithmic assessment of agent bias, and smart contracts employed to monitor this in real-time and make bias adjustment suggestions to improve actions or conceptualizations.

4.6 Processing

Most AI algorithms need huge amounts of data and computing power to accomplish tasks. Limiting factor in developing machine learning algorithms is time and computing power which are required to train modern machine learning algorithms.

The available computation resources are not feasible to accurately bring down the training error to reasonable upper bounds. This is limited to the computation resources available, like GPU cycles, and RAM. A lot of the world's computing Power goes to waste as thousands and millions of devices remain idle for a considerable amount of time. Being able to coordinate and combine these resources will enable us to make efficient use of computing Power.

Blockchain technology offers an ideal solution. Blockchains are immutable and can offer compute power required to solve machine learning problems. We will start utilizing individual clients across the blockchain network to solve machine learning computations which lead to the training of a machine learning algorithms. That's why we are going to integrate Crypto Angel's engine for training and executing machine learning algorithms into Golem network.

4.6.1 Golem network

Golem is a platform that provides distributed computing on the blockchain, where applications (requestor) can rent compute cycles from providers. Golem also has a decentralized reputation system that allows nodes to rank their peers based on their performance on appointed tasks. Benefit to using Golem is the incentivization of resource sharing. Participating nodes can earn rewards for making their idle computing resources available to others and the amount of computational power is massive compared to what is achievable on a single physical machine. This results in extremely quick model training times and that's why we are going to integrate Crypto Angel's engine for training and executing machine learning algorithms into Golem network, until we develop our own infrastructure.

4.7 Proof of Intelligence

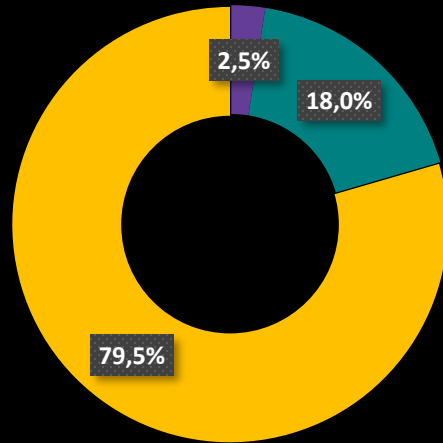
CryptoAngel blockchain is giving rise to a new form of consensus model called Proof of intelligence. We are reinventing new consensus mechanism, moving from a proof of work or proof of stake model as are the current industry standards for cryptocurrencies, to new consensus mechanisms called Proof of intelligence. This will be for higher-level CA Central intelligence smart network operations rather than simple transaction recording. In one way, proof of intelligence will serve as a reputational qualifier; as a proof of ability to participate. In another way, proof of intelligence will be an indication that some sort of 'mental' processing has taken place. For example, a new concept, idea, association, or knowledge element has had to have been generated to provide the consensus and include, to demonstrate the miner's bonafide status in registering the transaction and receiving the Angel token rewards. Proof of intelligence will be used in different ways as a reputational commodity in blockchain thinking networks.

5. CRYPTOANGEL TOKEN AND DISTRIBUTION

The Angel is a speculative digital coin available worldwide and built upon the Ethereum blockchain protocol. The core contract is an extended version of the Standard Ethereum token contract (ERC20). You can explore and prove it on <https://crypto-angel.com>.

Coins will be minted in the process of purchasing, and total number of issued tokens will be limited with crowdsale cap reached during the token sale process, meaning that Angels are generated as purchasers buy them and the total supply of Angels will be fixed after the end of the Angel token sale. The Angel has a hard cap of 88 million coins, and this supply will be fixed with no more to be issued. The price of the CryptoAngel will be determined by market forces and cryptocurrency exchange mechanisms. The CryptoAngel is also available in fractional amounts.

TOKEN DISTRIBUTION



■ Allocated for Advisory team
 ■ Retained by CryptoAngel team
 ■ Distributed during ICO

Token sale will be organized through ICO which will be available to general public. The total amount of CryptoAngel (CA) tokens distributed during the ICO will constitute of 79.5% of all CA tokens. The remaining 20.5% of CA tokens will be distributed among the co-founders, team and advisors.

Below you can find details on most important token properties and sales milestones.

5.1. CryptoAngel ICO

TOKEN SYMBOL	ANGEL
TOKEN POOL SUPPLY (HARD CAP)	88.000.000 (Eighty-eight million)
ICO START DATE	24 February 2018
ICO END DATE	31 March 2018
CROWDSALE CAP	70.000.000 (including bonuses)
ACCEPTED CONTRIBUTIONS	ETH only
TOKEN PROTOCOL	ETH, ERC20
TOKEN PRICE	1 ANGEL = 0.001 ETH
PERCENTAGE OF ANGEL ON OFFER	79.5% (assuming hard cap will be reached)

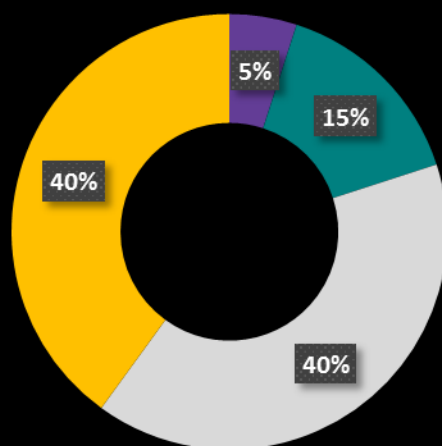


On February 24th, 2018 at 00:00 UTC we will offer a maximum (70 00 000) of 88 000 000 ANGEL tokens as a part of ICO event. ICO will last 5 weeks and will be open to the general public. The ICO will be open to anyone who wants to invest a minimum of 50 ANGEL (0.05 ETH). Bonus tokens will be available during the ICO, the first 30% of the crowdsale cap (0 - 27.300.000) will get 30% bonus, the next 30-45% of the crowdsale cap (27.300.000 - 39.900.000) will get 20% bonus, the next 45-60% of the crowdsale cap (39.900.000-51.450.000) will get 10% bonus ANGEL tokens on top of purchased tokens, while for the rest of the ICO tokens there won't be bonus applied.

5.2. Allocation of funds - POST ICO

Funds raised during the ICO will be used solely for the development of the CryptoAngel network. The following distribution of funds is preliminary and can be subject to change.

ALLOCATION OF FUNDS



- Legal and Regulation
- Marketing and promotion
- Operational and administration
- Core engineering and dev.

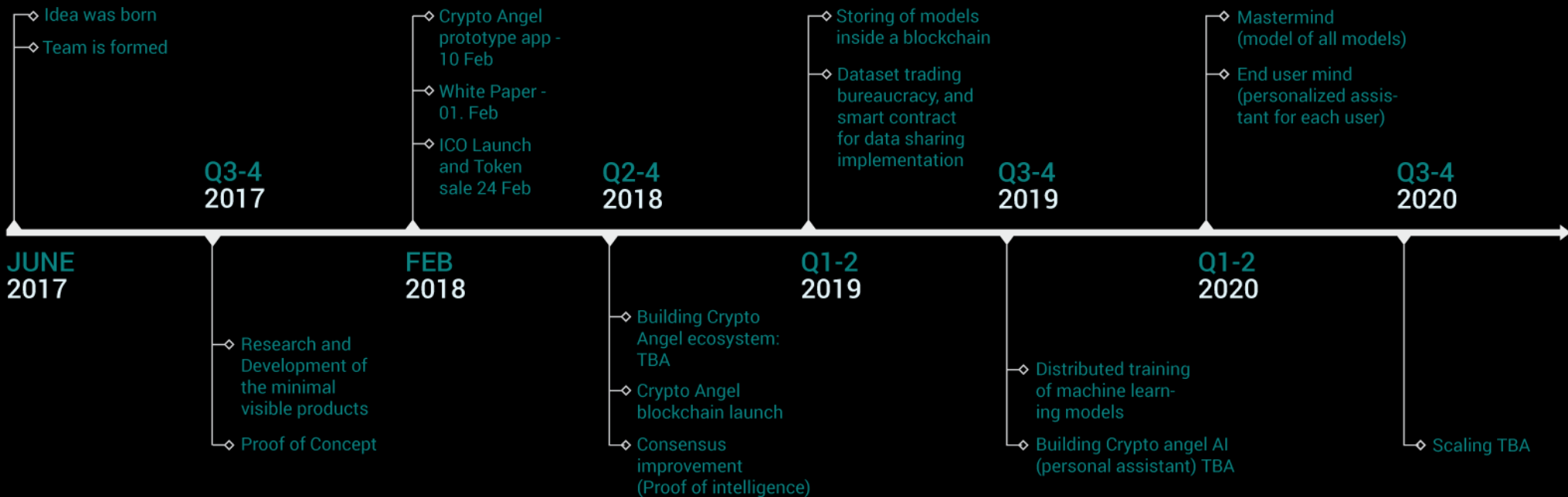
- Core engineering and development - implies development of the technology as described in this document. It includes development of CryptoAngel platform and all its components, smart contract systems, integration with external systems and protocols,

end-user application, but also hiring technical resources and establishing the infrastructure to support development.

- Operational and administration - Include expenditures for staffing, storage rental, facility, electricity, software procurement along with network costs. Includes finance, HR, administration and procurement costs spent on managing internal IT staff and/or outsourced providers.
- Marketing and promotion - Include promotional costs for creating marketing campaign for targeting key participants of CryptoAngel ecosystem. Marketing will be done through social media, direct marketing, partnerships etc.
- Legal and regulation - There are legal costs associated with privacy protection and registrations with regulators. The legal costs might vary from region to region.

6. ROADMAP

ROADMAP



7. TEAM

Stefan Jovanovic

Co-founder, Full-stack Engineer and blockchain enthusiast

Stefan has experience in different technologies and programming languages and last 5 years has been developing mobile applications for some of the world leading mobile brands. He is keen to translate his knowledge into the blockchain industry and eager to create deeper connection between mobile and blockchain technologies.

Marjan Jankovic

Co-founder and Lead Engineer

Electrical Engineer and blockchain enthusiast. Marjan is full-stack developer with more than 5 years' experience in different platforms (Tribefire, Alfresco, IBM WebSphere Commerce), frameworks (Spring, Hibernate, AngularJS), portals (Liferay, WordPress) and program languages (C/C++/C#, Java, JavaScript). His vision is to create strong platform which will be based on Blockchain and Artificial Intelligence technologies.

Vladan Podjanin

Co-founder and Infrastructure Lead

Vladan is a cryptocurrency expert and blockchain enthusiast, and has been an advocate of bitcoin since its very early days. He has over 10 years of experience in architecting, designing and implementing IT systems and infrastructure in enterprise environments. Vladan has Bachelor's degree in Computer Science and over 40 most appreciated IT certifications.

Nikola Cosovic

Recruiter Consultant

Dedicated Recruiting Consultant in IT industry field with proven skills in recruiting, marketing, advertising and interviewing. Creative, curious and open to new business ideas and approaches. Successful in creating and implementing recruiting strategies that have resulted in an over 60% increase in new highly qualified candidates.

Petar Korda

AI developer and Full stack engineer

AI developer and Full stack engineer, with a master's degree in Machine Learning and an interest in benefits and impact of blockchain. AI enthusiast, Petar has experience with many technologies and frameworks for developing Machine Learning models on different projects (Recommending systems, Bank user credit prediction etc.). He is passionate about the recent advances in AI and many applications of ML that are changing the way we will live.

Dimitar Anastasovski

Blockchain and AI Developer

Software engineer with a lot of experience in many programming languages. Currently working on projects related to blockchain for the European Union and implementing the benefits of blockchain in Banks. Involved in Machine learning and AI projects for leading companies. Currently in the final phase of Master Degree studies in Computer Science.

Ratko Kupresak

Financial Adviser

Senior Executive at Aujan Coca-Cola Beverages Company (ACCBC). Experienced FMCG Professional with 20 years of credible achievements in operations, strategic planning and execution of strategic route to market (RTM) initiatives. Efficient in managing P&L's for large businesses and building successful FMCG brands across East Europe and the UAE.

Milan Blanusa

Marketing Advisor

Milan is experienced product marketing professional with more than 7 years of managing complex regional and enterprise projects in domain of IT, telco and contextual marketing. He possesses broad knowledge of business development, product and project management.

Zoran Srejcic

Legal Advisor

Zoran is lawyer, entrepreneur, with a lot of experience from own law firm. Expert in civil procedure, contract law with extended knowledge in computer science. He also works as a mediator and negotiator (both with great success, and with large number of cases). He also has experience in consulting for EU funds.



CRYPTO ANGEL

DECRYPT YOUR POTENTIAL | VIRTUAL LIFE GUIDE

CRYPTOANGEL TOKEN SALE

TERMS AND CONDITIONS

The following **Terms and Conditions** ("**Terms**") govern your ("**you**" or the "**Purchaser**") purchase of cryptographic tokens ("**ANGEL**") from CryptoAngel, an exempted company registered in the Republic of Serbia (the "**Company**"). Each of you and the Company is a "**Party**" and, together, the "**Parties**" to these Terms. This document is not a solicitation for investment and does not pertain in any way to an offering of securities in any jurisdiction. This document describes the Angel token sale.

IF YOU DO NOT AGREE TO THESE TERMS, DO NOT PURCHASE ANGEL FROM THE COMPANY. BY PURCHASING ANGEL FROM THE COMPANY, YOU WILL BE BOUND BY THESE TERMS AND ANY TERMS INCORPORATED BY REFERENCE. IF YOU HAVE ANY QUESTIONS REGARDING THESE TERMS, PLEASE CONTACT THE COMPANY AT info@crypto-angel.com. By purchasing ANGEL, and to the extent permitted by law, you are agreeing not to hold any of the Company and its respective past, present and future employees, officers, directors, contractors, consultants, equity holders, suppliers, vendors, service providers, parent companies, subsidiaries, affiliates, agents, representatives, predecessors, successors and assigns (the "**CryptoAngel Team**") liable for any losses or any special, incidental, or consequential damages arising from, or in any way connected, to the sale of ANGEL, including losses associated with the terms set forth below.

DO NOT PURCHASE ANGEL IF YOU ARE NOT AN EXPERT IN DEALING WITH CRYPTOGRAPHIC TOKENS AND BLOCKCHAIN-BASED SOFTWARE SYSTEMS. PRIOR TO PURCHASING ANGEL, YOU SHOULD CAREFULLY CONSIDER THE TERMS LISTED BELOW AND, TO THE EXTENT NECESSARY, CONSULT AN APPROPRIATE LAWYER, ACCOUNTANT, OR TAX PROFESSIONAL. IF ANY OF THE FOLLOWING TERMS ARE UNACCEPTABLE TO YOU, YOU SHOULD NOT PURCHASE ANGEL.

PURCHASES OF ANGEL SHOULD BE UNDERTAKEN ONLY BY INDIVIDUALS, ENTITIES, OR COMPANIES THAT HAVE SIGNIFICANT EXPERIENCE WITH, AND UNDERSTANDING OF, THE USAGE AND INTRICACIES OF CRYPTOGRAPHIC TOKENS, INCLUDING ETHEREUM TOKENS, AND BLOCKCHAIN BASED SOFTWARE SYSTEMS. PURCHASERS SHOULD HAVE A FUNCTIONAL UNDERSTANDING OF STORAGE AND TRANSMISSION MECHANISMS ASSOCIATED WITH OTHER CRYPTOGRAPHIC TOKENS. WHILE THE COMPANY WILL BE AVAILABLE TO ASSIST PURCHASERS OF ANGEL DURING THE SALE, THE COMPANY WILL NOT BE RESPONSIBLE IN ANY WAY FOR LOSS OF BTC, ETH OR ANGEL RESULTING FROM ACTIONS TAKEN BY, OR OMITTED BY PURCHASERS. IF YOU DO NOT HAVE SUCH EXPERIENCE OR EXPERTISE, THEN YOU SHOULD NOT PURCHASE ANGEL OR PARTICIPATE IN THE SALE OF ANGEL. YOUR PARTICIPATION IN

ANGEL SALE IS DEEMED TO BE YOUR UNDERTAKING THAT YOU SATISFY THE REQUIREMENTS MENTIONED IN THIS PARAGRAPH.

PURCHASER AGREES TO BUY, AND COMPANY AGREES TO SELL, THE ANGEL TOKENS IN ACCORDANCE WITH THE FOLLOWING TERMS:

I. Conditions to ANGEL token sale

YOU MAY NOT MAKE A ACQUIRE AN ANGEL TOKEN IF YOU ARE A CITIZEN, RESIDENT (TAX OR OTHERWISE) OR GREEN CARD HOLDER OF THE UNITED STATES OF AMERICA, OR A CITIZEN OR RESIDENT OF THE REPUBLIC OF SOUTH AFRICA, OR THE REPUBLIC OF CHINA.

When you purchase, or otherwise receive, an ANGEL token, you may only do so by accepting the following conditions and, by doing so, you warrant and represent that the following are a true and accurate reflection of the basis on which you are acquiring the ANGEL tokens:

- neither the Company nor any of the CryptoAngel Team has provided you with any advice regarding whether ANGEL is a suitable investment for you;
- you have sufficient understanding of the functionality, usage, storage, transmission mechanisms and intricacies associated with cryptographic tokens, such as Bitcoin and Ether, as well as blockchain-based software systems generally;
- you are legally permitted to receive and hold and make use of ANGEL in your and any other relevant jurisdiction;
- you will supply us with all information, documentation or copy documentation that we require in order to allow us to accept your purchase of ANGEL and allocate ANGEL to you;
- you have not supplied us with information relating to your acquisition of ANGEL or otherwise which is inaccurate or misleading;
- you will provide us with any additional information which may be reasonably required in order that we can fulfil our legal, regulatory and contractual obligations, including but not limited to any anti-money laundering obligation;
- you will notify us promptly of any change to the information supplied by you to us;
- you are of a sufficient age (if an individual) to legally obtain ANGEL, and you are not aware of any other legal reason to prevent you from obtaining ANGEL;
- you take sole responsibility for any restrictions and risks associated with receiving and holding ANGEL, including but not limited to these set out in Annex A;

- by acquiring ANGEL, you are not making a regulated investment, as this term may be interpreted by the regulator in your jurisdiction;
- you are not obtaining or using ANGEL for any illegal purpose, and will not use ANGEL for any illegal purpose;
- you waive any right you may have / obtain to participate in a class action lawsuit or a class wide arbitration against any entity or individual involved with the sale of ANGEL;
- your acquisition of ANGEL not involve your purchase or receipt of shares, ownership or any equivalent in any existing or future public or private company, corporation or other entity in any jurisdiction;
- to the extent permitted by law and provided we act in good faith, the Company makes no warranty whatsoever, either expressed or implied, regarding the future success of ANGEL and/or the Ethereum Network;
- you accept that ANGEL is created and you obtain ANGEL on an “as is” and “under development” basis. Therefore, provided the Company acts in good faith, you accept that the Company is providing ANGEL without being able to provide any warranties in relation to ANGEL, including, but not limited to, title, merchantability or fitness for a particular purpose;
- you accept that you bear sole responsibility for determining if (i) the acquisition, the allocation, use or ownership of ANGEL (ii) the potential appreciation or depreciation in the value of ANGEL over time, if any, (iii) the sale and purchase of ANGEL; and/or (iv) any other action or transaction related to ANGEL has tax implications.

2. Overview of ANGEL sale

ANGEL is required for proper operation and comprehensive utilization of CRYPTOANGEL (as defined in the white paper (the “White Paper”) provided at <https://crypto-angel.com> (the “Website”) as of the date the Purchaser acquires ANGEL token). After the ANGEL sale, each ANGEL is backed by the purchase of the underlying assets, as described in the White Paper. To the extent they do not contradict these Terms, the rights connected to ANGEL are subject to the limitations set out in the White Paper, but this should in no case create obligations for the Company in addition to the ones contained in these Terms. The Company reserves the right to circumvent the algorithm used to select the underlying assets if it believes, in its sole discretion, that such selected underlying assets could adversely affect the Company or ANGEL from a regulatory or legal perspective. The Company shall have the right to sell any such underlying assets (if already part of ANGEL portfolio) and block their acquisition.

The maximum total amount of ANGELS to be issued is 88,000,000. ANGELS are generated as Purchasers buy them and the total supply of ANGELS will be fixed after the end of the ANGEL sale. No more ANGELS will be issued after the end of the ANGEL sale, as described in the preceding paragraph. Ownership of ANGEL during the ANGEL token sale carries no rights express or implied. Purchases of ANGEL are non-refundable.

3. After the ANGEL Token Sale

The Purchasers should have no expectation of influence over governance of the Company.

Upon the conclusion of a successful ANGEL sale, the digital assets backing each ANGEL token will be transparently purchased.

The Company will provide you with an official and regular audit conducted on the existence of the digital assets backing each ANGEL token. Through this audit, you can track and confirm that the digital assets backing your ANGEL have been received and acquired. Access to the audit results does not constitute a ANGEL purchase receipt or indicate in any way that the party possessing such access has rights to or ownership of the purchased ANGEL tokens.

Prior to a Purchaser selling ANGEL after the ANGEL token sale completion, such Purchaser shall ensure that the buyer of any such ANGEL undertakes to comply with all the provisions of these Terms as if such person were a Purchaser in the ANGEL token sale.

4. The Company Will Not Purchase ANGEL During the ANGEL Sale

The Company warrants that neither it nor its shareholders will purchase ANGEL during the ANGEL sale. Furthermore, the Company warrants that neither it nor its shareholders will purchase ANGEL from any third party during the period of the ANGEL sale.

5. All purchases of ANGEL are final

ALL PURCHASES OF ANGEL ARE FINAL. PURCHASES OF ANGEL ARE NON-REFUNDABLE. BY PURCHASING ANGEL, THE PURCHASER ACKNOWLEDGES THAT NEITHER THE COMPANY NOR ANY OF ITS AFFILIATES, DIRECTORS OR SHAREHOLDERS ARE REQUIRED TO PROVIDE A REFUND FOR ANY REASON.

IF THE COMPANY BELIEVES, IN ITS SOLE DISCRETION, THAT ANY INDIVIDUALS OR ENTITIES OWNING ANGEL CREATES MATERIAL REGULATORY OR OTHER LEGAL RISKS OR ADVERSE EFFECTS FOR THE COMPANY AND/OR ANGEL, THE COMPANY RESERVES THE RIGHT TO: (A) BUY ALL ANGEL FROM SUCH ANGEL OWNERS AT THE THEN-EXISTING MARKET PRICE AND/OR (B) SELL ALL CRYPTOCURRENCY ASSETS OF THE COMPANY.

6. Taxation of ANGEL and Taxation Related to the ICO

The Purchaser bears the sole responsibility to determine if the purchase of ANGEL with BTC, LTC, ETH or the potential appreciation or depreciation in the value of ANGEL over time has tax implications for the Purchaser in the Purchaser's home jurisdiction. By purchasing ANGEL, and to the extent permitted by law, the Purchaser agrees not to hold any of the Company, its affiliates, shareholders, director, or advisors liable for any tax liability associated with or arising from the purchase of ANGEL.

7. Privacy

The Purchasers may be contacted by email by the Company. Such emails will be informational only. The Company will not request any information from Purchasers in an email. See our Privacy Policy available on the Website for additional information

8. Force Majeure

The CRYPTOANGEL Team is not liable for failure to perform solely caused by:

- unavoidable casualty,
- delays in delivery of materials,

- embargoes,
- government orders,
- acts of civil or military authorities,
- acts by common carriers,
- emergency conditions (including weather conditions),
- security issues arising from the technology used,

or any similar unforeseen event that renders performance commercially implausible. If an event of force majeure occurs, the party injured by the other's inability to perform may elect to suspend the Terms, in whole or part, for the duration of the force majeure circumstances. The party experiencing the force majeure circumstances shall cooperate with and assist the injured party in all reasonable ways to minimize the impact of force majeure on the injured party.

9. Disclaimer of Warranties

THE PURCHASER EXPRESSLY AGREES THAT THE PURCHASER IS PURCHASING ANGEL AT THE PURCHASER'S SOLE RISK AND THAT ANGEL IS PROVIDED ON AN "AS IS" BASIS WITHOUT WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF TITLE OR IMPLIED WARRANTIES, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE (EXCEPT ONLY TO THE EXTENT PROHIBITED UNDER APPLICABLE LAW WITH ANY LEGALLY REQUIRED WARRANTY PERIOD TO THE SHORTER OF THIRTY DAYS FROM FIRST USE OR THE MINIMUM PERIOD REQUIRED). WITHOUT LIMITING THE FOREGOING, NONE OF THE CRYPTOANGEL TEAM WARRANTS THAT THE PROCESS FOR PURCHASING ANGEL WILL BE UNINTERRUPTED OR ERROR-FREE.

10. Limitations Waiver of Liability

THE PURCHASER ACKNOWLEDGES AND AGREES THAT, TO THE FULLEST EXTENT PERMITTED BY ANY APPLICABLE LAW, THE DISCLAIMERS OF LIABILITY CONTAINED HEREIN APPLY TO ANY AND ALL DAMAGES OR INJURY WHATSOEVER CAUSED BY OR RELATED TO (i) USE OF, OR INABILITY TO USE, ANGEL OR (ii) THE CRYPTOANGEL TEAM UNDER ANY CAUSE OR ACTION WHATSOEVER OF ANY KIND IN ANY JURISDICTION, INCLUDING, WITHOUT LIMITATION, ACTIONS FOR BREACH OF WARRANTY, BREACH OF CONTRACT OR TORT (INCLUDING NEGLIGENCE) AND THAT NONE OF THE CRYPTOANGEL TEAM SHALL BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES,

INCLUDING FOR LOSS OF PROFITS, GOODWILL OR DATA, IN ANY WAY WHATSOEVER ARISING OUT OF THE USE OF, OR INABILITY TO USE, OR PURCHASE OF, OR INABILITY TO PURCHASE, ANGEL, OR ARISING OUT OF ANY INTERACTION WITH THE SMART CONTRACT IMPLEMENTED IN RELATION TO ANGEL. THE PURCHASER FURTHER SPECIFICALLY ACKNOWLEDGES THAT THE CRYPTOANGEL TEAM IS NOT LIABLE FOR THE CONDUCT OF THIRD PARTIES, INCLUDING OTHER PURCHASERS OF ANGEL, AND THAT THE RISK OF PURCHASING AND USING ANGEL RESTS ENTIRELY WITH THE PURCHASER. TO THE EXTENT PERMISSIBLE UNDER APPLICABLE LAWS, UNDER NO CIRCUMSTANCES WILL ANY OF THE CRYPTOANGEL TEAM BE LIABLE TO ANY PURCHASER FOR MORE THAN THE AMOUNT THE PURCHASER HAVE PAID TO THE COMPANY FOR THE PURCHASE OF ANGEL. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF CERTAIN WARRANTIES OR THE LIMITATION OR EXCLUSION OF LIABILITY FOR CERTAIN TYPES OF DAMAGES. THEREFORE, SOME OF THE ABOVE LIMITATIONS IN THIS SECTION AND ELSEWHERE IN THE TERMS MAY NOT APPLY TO A PURCHASER. IN PARTICULAR, NOTHING IN THESE TERMS SHALL AFFECT THE STATUTORY RIGHTS OF ANY PURCHASER OR EXCLUDE INJURY ARISING FROM ANY WILFUL MISCONDUCT OR FRAUD OF THE CRYPTOANGEL TEAM.

11. Complete Agreement

These Terms set forth the entire understanding between the Purchaser and the Company with respect to the purchase and sale of ANGEL. For facts relating to the sale and purchase, the Purchaser agrees to rely only on the Terms in determining purchase decisions and understands that the Terms govern the sale of ANGEL and supersede any public statements about the ANGEL token sale made by third parties or by the CRYPTOANGEL Team or individuals associated with any of the CRYPTOANGEL Team, past and present and during the ANGEL token sale.

12. Severability

The Purchaser and the Company agree that if any portion of these Terms is found illegal or unenforceable, in whole or in part, such provision shall, as to such jurisdiction, be ineffective solely to the extent of such determination of invalidity or unenforceability without affecting the validity or enforceability thereof in any other manner or jurisdiction and without affecting the remaining provisions of the Terms, which shall continue to be in full force and effect.

13. No Waiver

The failure of the Company to require or enforce strict performance by the Purchaser of any provision of these Terms or the Company's failure to exercise any right under these Terms shall not be construed as a waiver or relinquishment of the Company's right to assert or rely upon any such provision or right in that or any other instance. The express waiver by the Company of any provision, condition, or requirement of these Terms shall not constitute a waiver of any future obligation to comply with such provision, condition or requirement. Except as expressly and specifically set forth in these Terms, no representations, statements, consents, waivers, or other acts or omissions by the CRYPTOANGEL Team shall be deemed a modification of these Terms nor be legally binding.

14. Updates to the Terms

The Company reserves the right, at its sole discretion, to change, modify, add, or remove portions of the Terms at any time during the sale by posting the amended Terms on the Website. Any Purchaser will be deemed to have accepted such changes by purchasing ANGEL. The Terms may not be otherwise amended except by express consent of both the Purchaser and the Company.

15. Cooperation with Legal Authorities

The Company will cooperate with all law enforcement enquiries, subpoenas, or requests provided they are fully supported and documented by the law in the relevant jurisdictions.

16. Indemnification

To the fullest extent permitted by applicable law, you will indemnify, defend and hold harmless the CRYPTOANGEL Team from and against all claims, demands, actions, damages, losses, costs and expenses (including attorneys' fees) that arise from or relate to: (i) your purchase or use of ANGEL; (ii) your responsibilities or obligations under these Terms; (iii) your violation of these Terms; or (iv) your violation of any rights of any other person or entity.

The Company reserves the right to exercise sole control over the defense, at your expense, of any claim subject to indemnification under this Section 18. This indemnity is in addition to, and not in lieu of, any other indemnities set forth in a written agreement between you and the Company.

17. Security

You are responsible for implementing reasonable measures for securing the wallet, vault or other storage mechanism you use to receive and hold ANGEL purchased from the Company, including any requisite private key(s) or other credentials necessary to access such storage mechanism(s). If your private key(s) or other access credentials are lost, you may lose access to your Tokens. The Company is not responsible for any losses, costs or expenses relating to lost access credentials.

18. Language

Currently, only English versions of any CRYPTOANGEL's communications is considered official. The English version shall prevail in case of differences in translation.

19. Governing Law

The Terms, the arbitration clause contained in them, and all non-contractual obligations arising in any way whatsoever out of or in connection with these Terms are governed by, construed, and take effect in accordance with Serbian law.

20. Arbitration

Any dispute or difference arising out of or in connection with these Terms or the legal relationships established by these Terms, including any question regarding its existence, validity or termination ("Dispute"), shall be referred to and finally resolved by arbitration under the Law of Arbitration of Republic of Serbia and by the Rules of the Permanent Arbitration at the Chamber of Commerce and Industry of Serbia in Belgrade which will be deemed to be incorporated by reference into this clause, save for any waiver of any rights the parties would otherwise have to any form of appeal or recourse to a

court of law or other judicial authority, which rights are expressly reserved. The number of arbitrators shall be three. The seat of the arbitration shall be Belgrade. The language of the arbitration shall be Serbian. The Law of the arbitration shall be Serbian Law.

The one and only court of jurisdiction will be jurisdiction of Serbian Court.

All nominations must be Serbian resident. If a party fails to nominate an arbitrator, the Court will do so. The Court shall also appoint the chairman. All arbitrators shall be and remain “independent” of the parties involved in the arbitration. The place of arbitration shall be Belgrade, Serbia. The language of the arbitration shall be Serbian. In deciding the merits of the dispute, the tribunal shall apply the laws of Republic of Serbia and any discovery shall be limited and shall not involve any depositions or any other examinations outside of a formal hearing.

A dispute arising out of or related to these Terms is personal to you and the Company and will be resolved solely through individual arbitration and will not be brought as a class arbitration, class action or any other type of representative proceeding. There will be no class arbitration or arbitration in which an individual attempts to resolve a Dispute as a representative of another individual or group of individuals. Further, a Dispute cannot be brought as a class or other type of representative action, whether within or outside of arbitration, or on behalf of any other individual or group of individuals.

By purchasing, owning, and using ANGEL, you expressly acknowledge and assume the following risks:

1. Risk of Losing Access to ANGEL Due to Loss of Private Key(s), Custodial Error or Purchaser Error

A private key, or a combination of private keys, is necessary to control and dispose of ANGEL stored in your digital wallet or vault. Accordingly, loss of requisite private key(s) associated with your digital wallet or vault storing ANGEL will result in loss of such ANGEL. Moreover, any third party that gains access to such private key(s), including by gaining access to login credentials of a hosted wallet service you use, may be able to misappropriate your ANGEL. Any errors or malfunctions caused by or otherwise related to the digital wallet or vault you choose to receive and store ANGEL in, including your own failure to properly maintain or use such digital wallet or vault, may also result in the loss of your ANGEL. Additionally, your failure to follow precisely the procedures set forth in for buying and receiving Tokens, including, for instance, if you provide the wrong address for the receiving ANGEL, or provides an address that is not ERC-20 compatible, may result in the loss of your Tokens.

2. Risks Associated with the Ethereum Protocol

Because ANGEL and the CRYPTOANGEL 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 ANGEL. Moreover, advances in cryptography, or technical advances such as the development of quantum computing, could present risks to the ANGEL and the platform, including the utility of the ANGEL for obtaining services, by rendering ineffective the cryptographic consensus mechanism that underpins the Ethereum protocol.

3. Risk of Mining Attacks

As with other decentralized cryptographic tokens based on the Ethereum protocol, ANGEL are susceptible to attacks by miners in the course of validating ANGEL 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 ANGEL, including, but not limited to, accurate execution and recording of transactions involving ANGEL.

4. Risk of Hacking and Security Weaknesses

Hackers or other malicious groups or organizations may attempt to interfere with the platform or ANGEL 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 the Company team may intentionally or unintentionally introduce weaknesses into the core infrastructure of the platform, which could negatively affect the platform and ANGEL, including the utility of ANGEL for obtaining services.

5. Risks Associated with Markets for ANGEL

If secondary trading of Tokens 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 ANGEL (e.g., as denominated in a digital or fiat currency), such value may be extremely volatile.

6. Risk of Uninsured Losses

Unlike bank accounts or accounts at some other financial institutions, ANGEL is 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.

7. Risks Associated with Uncertain Regulations and Enforcement Actions

The regulatory status of ANGEL and distributed ledger technology is unclear or unsettled in many jurisdictions. It is difficult to predict how or whether regulatory agencies may apply existing regulation with respect to such technology and its applications, including the CRYPTOANGEL platform and ANGEL. 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 its applications, including the platform and ANGEL. Regulatory actions could negatively impact the platform and ANGEL in various ways, including, for purposes of illustration only, through a determination that the purchase, sale and delivery of ANGEL constitutes unlawful activity or that ANGEL is a regulated instrument that require registration or licensing of those instruments or some or all the parties involved in the purchase, sale and delivery thereof. The Company may 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.

8. Risks Arising from Taxation

The tax characterization of ANGEL is uncertain. You must seek your own tax advice in connection with purchasing ANGEL, which may result in adverse tax consequences to you, including withholding taxes, income taxes and tax reporting requirements.

9. Risk of Competing platforms

It is 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 CRYPTOANGEL services.

10. Risks Arising from Lack of Governance Rights

Because ANGEL confer no governance rights of any kind with respect to the CRYPTOANGEL platform or the Company, all decisions involving the Company's products or services within the platform or the Company itself will be made by the Company at its sole discretion. These decisions could adversely affect the platform and the utility of any ANGEL you own, including their utility for obtaining services.

11. Unanticipated Risks

Cryptographic tokens such as ANGEL are a new and untested technology. In addition to the risks included in this Annex A of these Terms, there are other risks associated with your purchase, possession and use of ANGEL, including unanticipated risks. Such risks may further materialize as unanticipated variations or combinations of the risks discussed in this Annex A of these Terms.

