Graph
Grail

# GraphGrail AI

**GraphGrail AI is the world's first Artificial Intelligence platform for Blockchain, built on top of a natural language processing technology and a DApp marketplace.**

**http://graphgrail.com**

Telegram: https://t.me/GraphGrailAi
Golos: https://golos.io/@bitcoinking
Steemit: https://steemit.com/@gromozeka

2017

## THE WORLD HAS CHANGED

Although many central banks and regulators have been studying blockchain technology for years, the country furthest out in front of the space is probably Singapore, which has begun to implement the technology in practice. According to the Monetary Authority of Singapore, this is internally known as "Project Ubin". The goal of the project, which is being conducted jointly by the central bank and the blockchain company R3, is to create a blockchain digital token version of the Singapore Dollar.

R3 is at the head of a consortium of over 70 companies and financial institutions from across the world. The company was formed in 2015 with the goal of developing blockchain solutions for the next generation of global finance. Its main accomplishment thus far has been the development of the Corda platform, which is designed to standardize transactions across the financial sector.

Project Ubin began in March 2017; its first phase is already complete. The system allows banks to exchange digital currency to and from cash, which is essentially the goal of the Monetary Authority.

Aside from MAS, many other large banks are also working with various blockchains. According to Reuters, one of the first institutions to investigate the possibility was the Bank of America, which integrated a blockchain solution with the help of Microsoft. CNBC has reported that Japanese banks, including AEON Bank, Nomura Trust Banking and Mizuho, have also begun to work with the blockchain. Russian banks, including Sberbank of Russia and VEB (Vnesheconombank), have begun integrating it as well. In addition, the Russian president, Vladimir Putin, has recently met with Vitalik Buterin, the founder of Ethereum, stunning the cryptocurrency world and leading to a jump in ethereum's price across leading exchanges.

One of the largest investment banks in the world, Goldman Sachs, has created a site that explains the advantages of the blockchain over traditional banking (http://www.goldmansachs.com/our-thinking/pages/blockchain/). The company has announced it is actively working on blockchain projects. Meanwhile, South Korea has begun hearings on three new cryptocurrency laws designed to regulate cryptocurrencies and exchanges (though, according to the Korea Herald, the law is expected to be fairly strict); the ruling party's goal is to create a legal basis for Bitcoin and Ethereum usage and trading.

Both governments and corporations have increasingly understood that the blockchain is an ideal solution to optimize their internal systems. As part of making their land registry system more transparent and safer, the government of Honduras has asked the American blockchain startup Factom to develop a blockchain-based solution. The government of Greece, whose land registry only covers 7% of its territory, has also expressed interest.

The Spanish bank Santander, ranked 10$^{th}$ in the world in deposits, claims it can use blockchain technology in over twenty internal systems. Santander's analysts claim that blockchains can lower global costs to financial institutions by $15-20 billion dollars by 2022, mostly due to lower transaction costs, cross-border trading costs and compliance fees.

Other finance giants – Goldman Sachs, JP Morgan, Credit Suisse and another half dozen cross-national banks – are developing a set of common standards for blockchain as part of an effort to find use cases for it in the financial sector. They have jointly invested in the R3CEV startup.

The growth in blockchain transactions is not due solely to governments and major corporations; small companies have also begun to use it. For example, the American startup Everledger is planning to use an open ledger to track unique features of certain specific diamonds. If such a diamond is ever stolen, the ledger will provide unequivocal proof of ownership.

These are just some of the important names who have started to work on the blockchain technology. As cryptocurrency develops, experts believe that the technology will advance throughout many industrial sectors, not just in banking and finance – though these sectors will certainly lead the way.

## WHAT IS GRAPHGRAIL AI?

GraphGrail AI is the world's first Artificial Intelligence platform for Blockchain, built on top of a natural language processing technology platform and a DApp marketplace.

*Our mission: the creation of a **strong** AI (Artificial general intelligence) that will be open to all, controlled and trained by developers throughout the entire world.*

*The concept is similar to Elon Musk's OpenAI, but for meaning.[0]*

We are developing a platform for analyzing large amounts of text data, solving the problems of extracting knowledge (IR – information retrieval) and complex semantic classification based on machine learning, neural networks and deep learning technologies. Our priorities are the banking sector, biotechnology and medicine, security and law enforcement. The key element of the platform is a universal constructor for complex classifications of text, i.e. an AI designer.

Our team has spent the past 2 years on R&D in the field of natural language analysis (NLP), information retrieval and the training of artificial neural networks. The result was the AI designer, which allows any user to create models and train a neural network in a variety of tasks. Possible applications include but aren't limited to spam detection, distinguishing text styles, searching for fakes based on language attributes, and testing complex conditions in smart contracts.

An important feature of the platform is that it provides a full cycle of work with data, from collection through markup and the final results.

Business executives, startup owners, developers, and data scientists will all be able to utilize a rich API and the ability to create custom applications to integrate the AI designer into their own services and apps. We allow other companies to use our service and apply it in their own business.

All users, even those without special training, can earn money using the platform through creating, improving and voting on language models. The project does this through its associated GAI (**G**raphgrail + **Ai**) tokens, which are standard ERC20 tokens on the Ethereum blockchain. The models may have different attributes: they can be complex learning classifications, prediction models or simply improve the workflow for training the AI.

*For the non-tech savvy, a linguistic model is simply a file ranging from 15 MB to 1.5 GB in size. This may be the result of training the AI to output certain data or a set of ontological handlers for the specific domain.*

***Welcome to the Blue Ocean – the AI ecosystem that allows the business to continually innovate, develop and enter new markets.***

## INTRODUCTION: A TECHNOLOGY OVERVIEW

GraphGrail's AI designer is a unified analytics platform that allows businesses and government agencies to solve the problem of analyzing and classifying large volumes of text data. The designer provides the end product and also has a user-friendly API.

Today, the analytics industry is experiencing a period of rapid growth among customers interested in analyzing text. Such customers include banks, telecom companies, retail businesses and government ministries, along with electoral commissions and political parties. All of these clients face a variety of problems: unwanted text needs to be classified (into categories such as spam, fraud, etc.) and knowledge needs to be extracted (i.e., product and service analytics).

Our designer provides a variety of linguistic models, allowing clients to quickly create an ontology (model). Programming skills are not necessary. The model can be tested and refined on the fly, supplementing it and improving its accuracy and completeness.

*The main advantage of the service is its ability to guarantee the client a full cycle of data gathering and analysis: it can gather the data on its own, the AI neural network can learn to analyze it, and the end result can be returned via a web interface or properly formatted reports.*

## THE KEY PROBLEM OF THE AI MARKETPLACE

Today, there is no full service AI similar to ours on the market; no one is offering an AI that can create similar models without programming. This kind of task is usually done by hiring programmers for a 5-12 month project, which only covers one specific task.

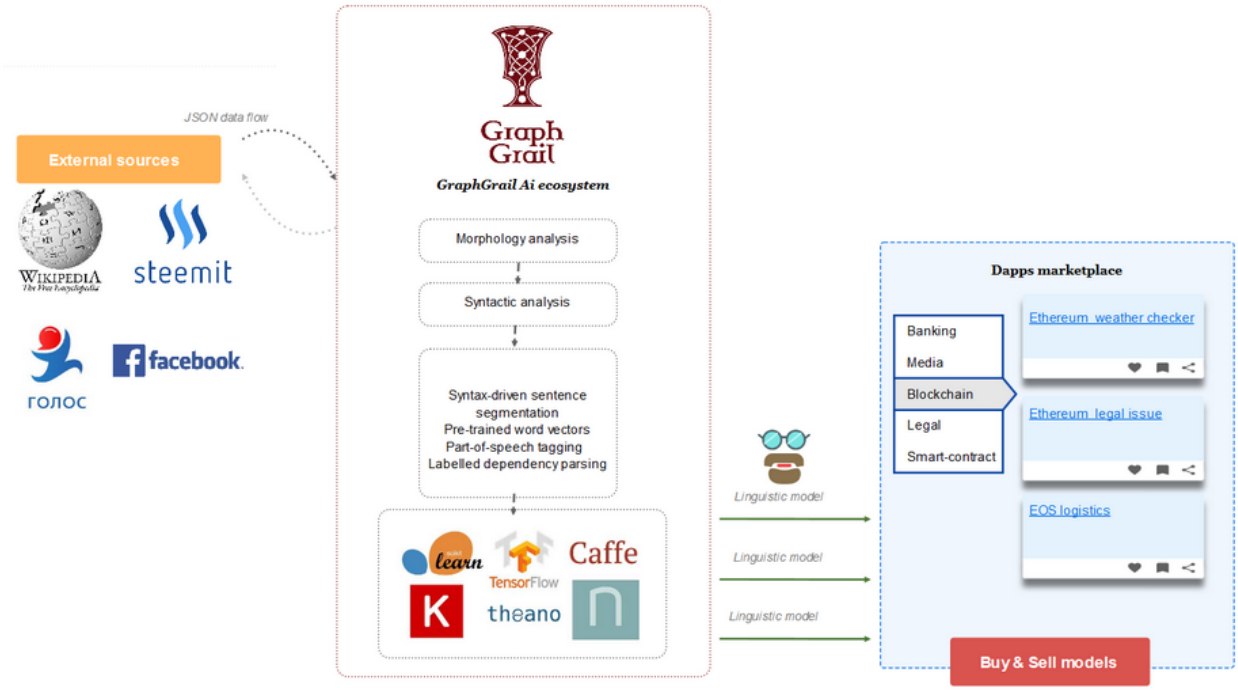
**Why so long?**

The fundamental problem of the text analytics, machine learning and AI marketplace is **not enough data.**

Let's take a step by step look at how a business may solve a similar problem (for example, analyzing its own products and services, then conducting competitor analysis):

1. Many fields don't have a public database for this kind of data; it must be collected, cleaned up and formatted correctly.
2. Even if the data exists, there usually isn't enough of it; AI deep learning requires from several thousand to millions of examples.
3. The data is not formatted properly; in order to use AI algorithms, tens of man hours are required to format it first.
4. Once everything is ready, the AI neural network may be trained, but only once.
5. The data quickly becomes stale; it must be continually collected and fed into the AI, which requires repeating steps 1-4.
6. Throughout this cycle, the business must hire and pay specialists, who usually have a high price tag and work only when the model must be refined.

## THE SOLUTION




Picture 1: GraphGrail AI's architecture

The service has two modules: a text/data analytics module and an AI deep learning module.

The analytics module architecture contains three levels of data analysis: a morphological, syntax and high level analysis based on our previous development.

The neural network module contains several methods and ways to train the neural network (RNN, LSTM, etc.) on the data previously formatted by the analytics module.

Thanks to this modular text processing architecture, the service allows:

1. A shorter development time of linguistic models for a given task;
2. Accumulating and incrementally improving the quality of results coming from the trained neural network, along with making its future retraining easier
3. Identify complex compound linguistic attributes (features) that are related to a particular subject area.

Thus, the system implements our data processing method and outputs a new qualitative result – analyzing and classifying complex semantic data.

*Modern networks require large data sets to train themselves successfully; they do not know how to understand something from only a few examples. This makes it difficult to use them in areas where large data sets have not been created, even though a couple of examples are often enough for a person to make a deep generalization. The reason is that training an AI with overly small sample sizes invites overfitting; when there are few samples and the subject area is complex (i.e. there are lots of parameters), the network will 'remember' special cases instead of generalizations. As a result, the AI will show good results on the data sample, but not on a real world test, as the test will be full of other special cases. The more parameters, the more training samples are required to avoid the problem.*

*There are three approaches to solving this problem: regularization, architectural tricks, and transfer learning. The technical and scientific solutions that will be implemented in our product will be able to effectively solve the task using internal transfer learning with pre-mediated models and semantic categories. We believe the problem of "one-shot learning" described above can be successfully solved. [1]*

## USE CASES FOR BLOCKCHAIN COMPANIES

The GraphGrail AI platform is a meta-service that can dramatically hasten the creation of new companies and startups in the analytics sector.

**Use cases:**
1)*The service is helpful to all blockchain companies.* It can be used for smart contracts in order to check whether an external condition has been fulfilled. Such conditions can be virtually anything tied to real world objects, people, companies and their interactions:

- An externally reported meeting between businessmen and politicians;
- A contractual agreement;
- The purchase or sale of a company;
- A judicial decision;
- Tracking a supply chain;

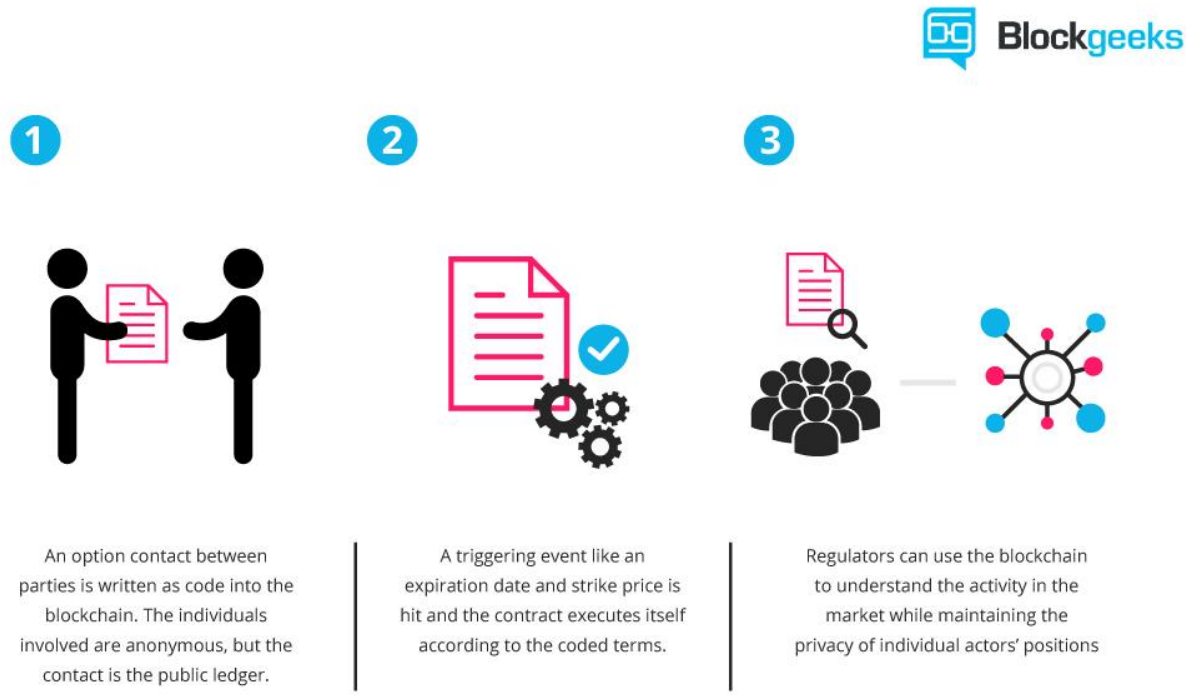
- An analysis of a new fund or a stock exchange;
- Weather changes;
- A deadline.

With the assistance of smart contract oracles, GraphGrail AI will automate smart contract execution and lower the risk of counterparties requiring arbitrage.

2) *The service ensures security when executing contracts.* The service allows a smart contract to account for force majeure (acts of God) and similarly exceptional cases. Using an outside trusted source, it is possible for the AI to automatically check for such cases and analyze the raw information to potentially alter the contract.

For example: two companies have entered into a supply agreement. However, the external conditions have changed significantly: weather conditions (strong wind, low temperature, humidity, etc.), political shifts (abolition or adoption of a law) or outside factors (a third party supplier could not deliver the components) have altered the deal. In this scenario, the GraphGrail AI platform solves the problem of providing data to a smart contract by accessing external sources such media, social networks, Wikipedia, etc., collects and analyzes data important to the contract, and decides whether the contract should still be executed. In other words, the AI becomes the procedure that provides the foundation for the execution of transactions. The implementation is assumed to be on a sidechain.

*Sidechains are a new blockchain based on the parent chain (for example, Bitcoin or Ethereum). Sidechains implement new financial ecosystems through integration into BTC/ETH and other chains, which distinguishes them from other crypto-currencies that ignore existing networks. Using sidechains, we can easily create all sorts of smart financial contracts, stocks, futures, derivatives and much more. On the basis of bitcoin, it is possible to create an infinite number of sidechains with different tasks and features, all of whose assets will depend on the volatility of the main chain. Based on this, the sidechain contributes to the further expansion of applications and innovative spaces for the blockchain technology. They allow traditional blockchains to support several types of assets such as micropayments, smart contracts, safe transactions, registration of real property rights, etc., and also increase the confidentiality of blockchain transactions.*




Picture 2. The major smart contract problem: in Step 2, a smart contract usually cannot execute any transaction that is reliant upon outside conditions to complete.

***Using deep learning AI, smart contracts will genuinely become smart.***

3) *M&A, credit and accounting* will also use smart contracts – for example, to check risks and conduct audits in a reasonable amount of real time. Lawyers can switch from creating traditional contracts to creating standard smart contracts.

The AI also solves many business problems; the AI constructor allows developers to provide their own solutions tailored to the specific business (similar to Microsoft Azure, Unity or Wix).

4) *Predictive analytics.* A custom query can use posts made on social networks about cryptocurrencies to populate a dashboard that helps trade them, along with warning the user about possible price drops based on the overall tone of newly made posts.

5) *Personalized spam analysis and filtering for interesting news (Big Data).* For example, active Telegram channels may have 100-200 messages an hour, far too much for a user to read through even if they wanted to. An AI can search for useful messages in each channel that are custom-tailored to the user and the channel, even though the user may have very different reasons for being in different channels.

*GraphGrail AI is the brain of the blockchain.*

## USE CASES FOR EXISTING BUSINESSES

Today, the service can be used for business and government analytics purposes. Current uses cases include product and supply chain issues and finding fake news.

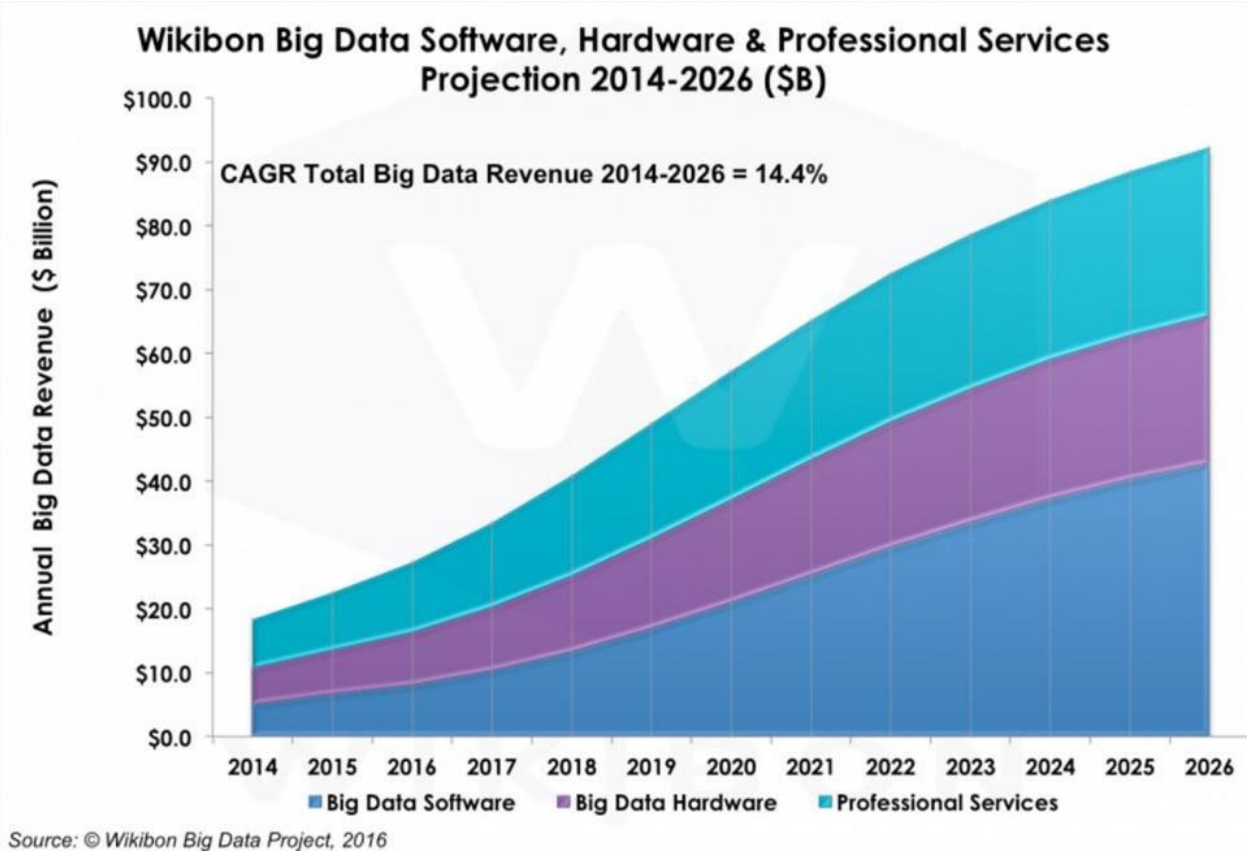
In the near future, traditional businesses will begin to migrate to blockchain en masse. GraphGrail will be ready to provide the same kinds of analytics services that businesses use today, such as:

- **Speech recognition services.** Audio is translated into text, then analyzed.
- **Bank services.** GraphGrail can be used to detect credit card fraud, fraudulent access to bank accounts or personal data, and to look through third party forum posts by bad actors offering those services on the darknet. The system itself can find these posts without a human having to read them first.
- **State structures.** The service can conduct polling and analytics based on what it finds. Election commissions can use the service to identify unlawful campaigning.
- **Politicians.** Political parties, deputies, senators and congressmen will be able to use the service to monitor public opinion about people, events and phenomena.
- **Fake news.** Fake news is the deliberate spread of hoaxes or misinformation on social media and traditional media, with the aim of misleading readers in order to obtain financial or political benefits. The authors of fake news often use catchy headlines or completely fabricated stories to increase readership and citations. The largest companies from the media industry, such as Facebook, are involved in the fight against fakes, but the problem is that it is often impossible to establish the authenticity of news before checking the facts. GraphGrail AI provides a tool for developing a fake news identification model based on linguistic attributes inherent in untrue news.
- **Fraud.** GraphGrail Ai is able to adapt to changing business conditions and to identify reports or complaints about fraud in a variety of industries, including new ones that do not have historical data.
- **Automated support systems.** GraphGrail AI can be an “intelligent helper” for technical support teams, selecting the answers that are relevant to the questions a user has and significantly reducing the time and complexity of supporting thousands of users.

## THE MARKET: CURRENT MARKETCAP AND FUTURE POTENTIAL

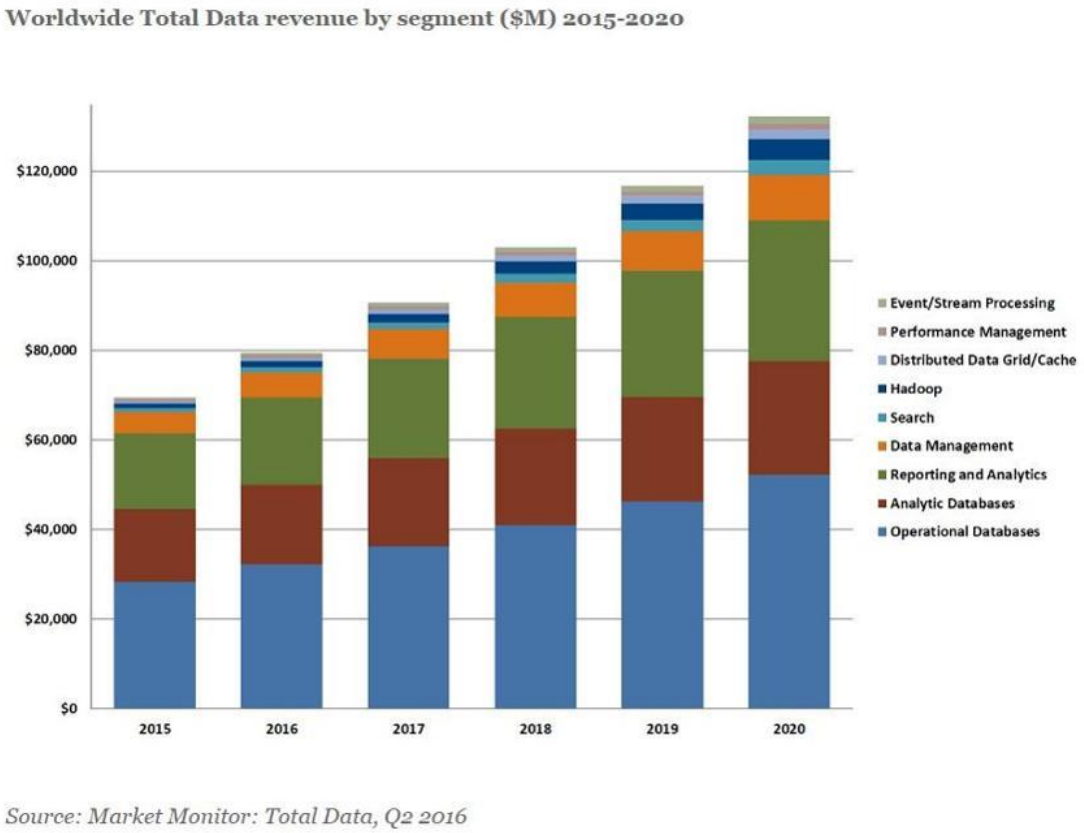
According to Forbes, the analytics market will grow enormously over the next several years [2]. IDC indicates that worldwide spending on analytics will grow to 187 billion dollars by 2019, growing by over 50% in five years.

By 2020, predictive analytics will attract over 40% of all investing into business solutions. Wikibon claims that Big Data spending will grow from 18.3 billion in 2014 to 92.2 billion in 2026, with a yearly CAGR growth of 14.4%. [4]




Picture 3. The Big Data sector will grow by 14.4% a year

IDC predicts that global spending on cognitive systems will reach 31.3 billion with yearly CAGR growth of 55%. [5] Over 40% of this spending will be on software that can assist in or make complex cognitive decisions, including text and rich media analysis, tagging, search, machine learning, categorization, clusterization, generating hypothesis, automated support systems, visualization, filters, signaling and navigation.

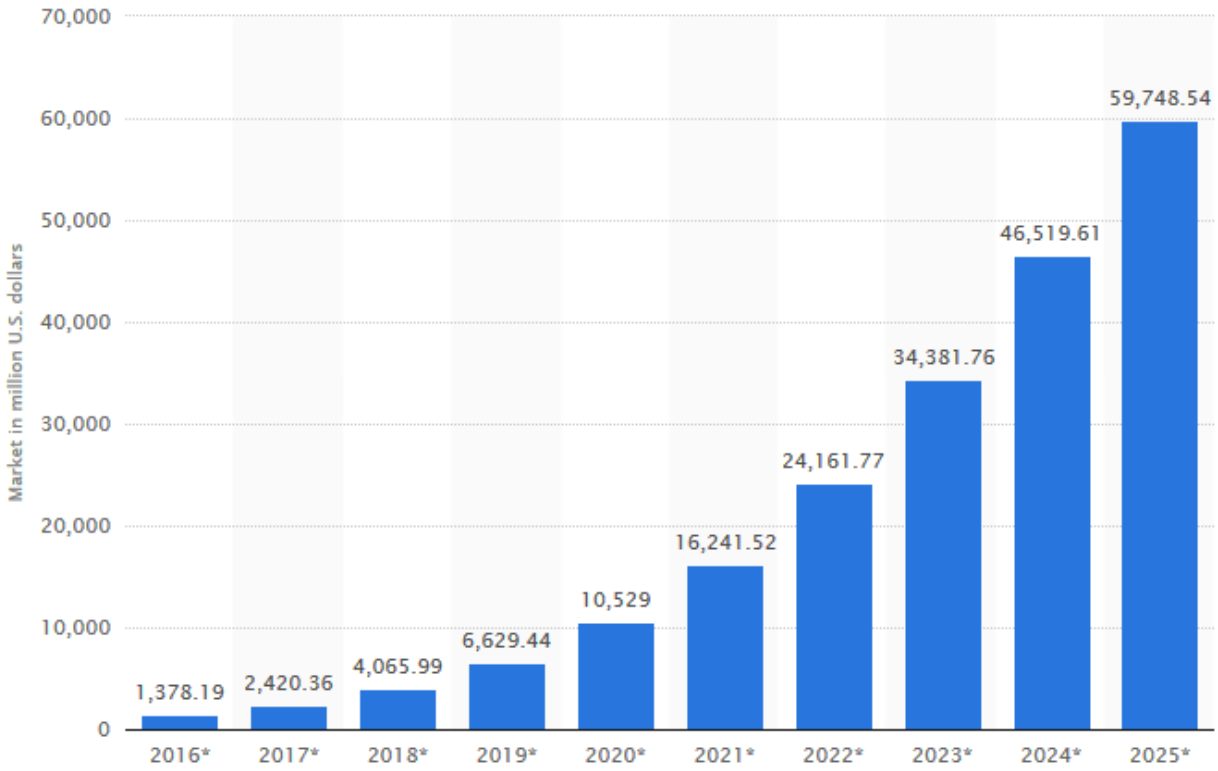



Picture 4. Worldwide total data revenue by market segment

Service 451 Research's Total Data Market Monitor predicts data analysis will grow into a 132 billion dollar sector by 2020. [6]

The statistical analysis firm Statist predicts that the global AI marketplace will be 59 billion dollars by 2025. [7]

According to http://ideya.eu.com/publications.html, http://экономикарунета.рф/2014/ and http://www.cossa.ru/articles/149/17590/, the text analytics market within Russia is growing at 15% a year.




Picture 5. AI global market revenues worldwide, 2016-2025

The main drivers of this market worldwide are social networks (including future blockchain giants such as Status), messengers, and startups working on related fields such as chatbots and smart assistants.

Our key client segments include:

1. KaGAIe users – KaGAIe is a platform for AI deep learning contests
2. StackOverflow users – StackOverflow is a key resource for developer Q&A
3. Users of relevant startups covering this space such as VentureBit, Vc.ru, and ProductHunt, Forbes
4. Consumers of blockchain media resources – people who read websites such as Forklog, Bits Media, Blockgeeks, Cryptocompare, CoinSpot, CoinTelegraph, CoinDesk, Bitcoin Magazine, and CoinJournal

## COMPETITORS

Some of the key purchases made by our competitors in this sector:

- IBM purchased AlchemyAPI for 100 million dollars in March, 2015 (AlchemyAPI later became the foundation for Watson)
- Rostelecom purchased “Aykumen IBS” for roughly 50 million dollars in November, 2015
- Google bought API.ai in September, 2016

Data-processing startups continue to attract investment. Recent ones of note include Narrativescience, Versive, and Dataminr.

Additionally, the recent blockchain startup Numer.ai solves the problem of retraining for data specialists, but we see them more as a partner than a competitor.

Indirect competitors include services that monitor social networks. However, as a rule, they do not provide any analytics except for a simple positive / negative. These services include Youscan, Semanticforce, and Wobot.

We would like to note that although some of the services of our competitors are powerful, they do not provide sophisticated semantic analysis and their capabilities are limited to extracting named entities (Named Entity Recognition). They do not provide convenient interfaces for working with text data and users frequently have to use several different solutions, run into problems with data export and import, etc. They also do not work well enough with Russian and other inflectional languages (languages with a free order of words.)

## MONETIZATION

The company will use the SaaS (software as a service) business model. Users will be charged monthly, semi-annual or annual subscriptions.

We will have flexible fees that depend on the amount of data processed per month, the analysis difficulty, the number of data faucets etc. We will also charge separately for API access.

## ICO TOKEN DISTRIBUTION

Funds raised from selling GAI tokens will be used for marketing and to launch the DApps linguistics model marketplace.

1,000,000,000 GAI tokens will be issued. The distribution is as follows:

18% (180,000,000) will be kept in a reserve fund.
30% (300,000,000) will be earmarked for the GraphGrail AI team to continue to develop the project. These tokens will be stored in multisig wallets.
2% (20,000,000) will be earmarked for the bounty campaign and ICO marketing.
50% (500,000,000) will be sold to investors.

The ICO will take place in stages, as follows:

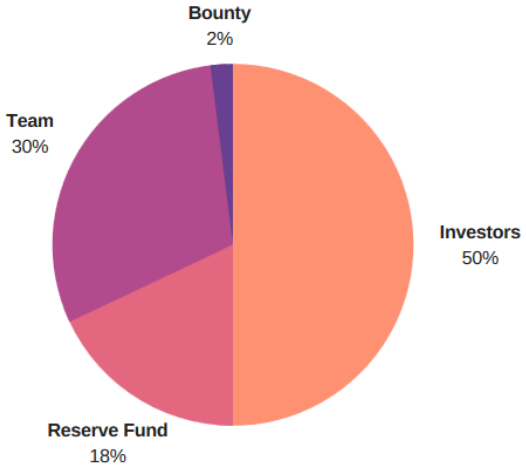
**1) Closed presale (July 2017)**

Maximum 714286 GAI tokens will be sold.
Amount to raise: $10,000
1 GAI = $0.014

**2) Presale (pre-ICO) (October 2017)**

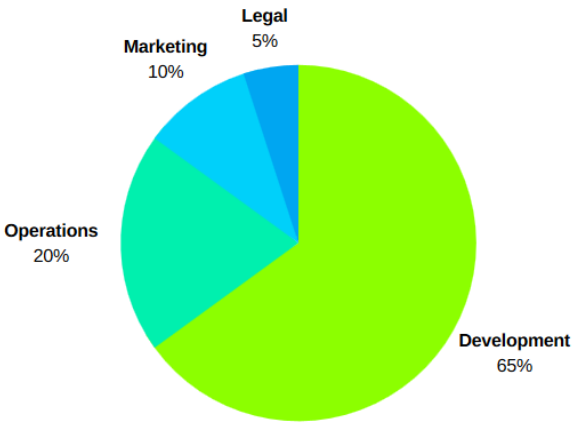
10 million GAI tokens will be sold.
Amount to raise: $200,000
1 GAI = $0.02

**3) ICO (October 2017)**
The ICO will sell between 50 and 500 million tokens.
Minimum sold: $5,000,000
Cap: $50,000,000
1 GAI = $0.1




Picture 6. Token distribution

Funds will be used to launch the app globally, marketing, support premium accounts, pay partners, and pay outside developers who choose to use GraphGrail AI's platform.




Picture 7. Intended use of revenue

## THE SCIENCE AND TECHNOLOGY STACK

1. We use vector pretrained models - word2vec and doc2vec. These models make it possible to automatically define the semantic proximity of words, i.e. synonyms and antonyms.

2. Latent Dirichlet allocation (LDA) - allows GraphGrail to determine the relationship (similarity) between the topics of two documents.
3. Our custom development: a methodology of designing linguistic models through ontology, allowing GraphGrail to extract structured knowledge. We use a wide set of relationships, including taxonomy (category-subcategory), part-whole, and so on.
4. Specialized software tools for training artificial neural networks (RNN, LSTM) with the possibility of saving the resulting model in a file: gensim (for thematic modeling) and scikit-learn (a package for scientific data processing and machine learning).

## ADVANTAGES TO MODEL DEVELOPERS

In the process of studying the market for data analytics, machine learning, and the existing practices of using neural networks, we found a key bottleneck: to train a neural network requires a) between tens of thousands and millions of text samples, depending on the task, and b) this data must be qualitatively marked out (developers must create training samples and test sets). All of this preparation must be done manually.

Every company solves the problem of searching datasets on its own - as a rule, there are no such datasets in the public domain. While linguists have publicly available databases like Wordnet (https://wordnet.princeton.edu) or NKRN (http://www.ruscorpora.ru ) and others, many branches of human activity do not have these, which means that it takes hundreds of hours of work for programmers in each company to extract knowledge from text data.

The GraphGrail AI team also encountered this problem when developing a model for one of its customers: there are no ready-made mapped datasets in the public domain and the markup is very complex, so a number of composite features must be considered when determining language attributes. Our development solves this fundamental problem and provides a simple and intuitive interface for creating a domain model and subsequently using it for machine learning. There are no direct analogs on the market at present.

Advantages of using the platform for users include:
1. The platform is not just for brand analytics; it can be adapted to many tasks suitable for any industry, such as fraud detection, illegal activity, fake news, manipulation of opinion, and so on.
2. The AI designer allows users to customize the analysis to suit themselves, which raises the quality and reduces the processing time for their analytics. We use our own designer, which takes into account the morphology of the Russian language [English is scheduled for Q4 of this year], lemmas, bigrams, and complex reconciliations (by gender, number, and case).
3. An API – we will build a programming interface for those who do not want to use the web interface or who have specific tasks.

This approach is the foundation for the development of a strong Artificial Intelligence: special functionality will be available that will apply various models in parallel.

## THE MARKETPLACE OF MODELS AND ECONOMIC STIMULUS

Tokens will be awarded for creation, improvement, and testing of all linguistics models. Because users will be creating and sharing them, they'll need a public database that is protected against malicious actors.

*This is an advantage to using blockchain, as opposed to private closed source development; the work will be sped up. Instead of a regular 5 programmer data science team, hundreds of thousands of developers from across the world will be involved.*

Integration with blockchain media companies will allow the service to query the blockchain and grab data for training the AI neural net.
The DApp marketplace will also allow developers the freedom to test competing models, to merge them together and to obtain new (better) solutions.

Similar to Steemit and Golos, GAI tokens will be paid out to users according to an internal formula that takes the following into account:

- The median complexity of the model, as determined by the number of words and phrases present in the text
- The difficulty of the topic
- The presence or absence of public datasets for the topic
- The size of the dataset for deep learning and markup
- The complexity of the markup
- The number of layers in the AI neural network
- The number of iterations the AI has gone through thus far
- Precision and recall attributes when the AI has been tested using the model
- Whether businesses are using the model
- The amount of API calls necessary to solve the issue

In the interests of fairness, the GraphGrail platform will act as the service provider for end users and developers and allows users to earn a share of the money taken in from API access sales. However, all intellectual property created by the platform will be owned by GraphGrail.

## ROADMAP

July 2017:
- GraphGrail AI ICO presale campaign

August 2017:
- Full scale testing of the product on pilot projects
- Ver. 1.0 release preparation
- Marketing campaign and ICO pre-seed round preparation

September, 2017:
- Public launch of ver. 1.0 (alpha)
- GraphGrail AI pre-ICO

October-December 2017:
- GraphGrail AI ICO
- Full launch of the platform and of the linguistic model library; launch of API access
- First phase of English language support (the current AI is being trained on Russian)
- Load testing of the platform
- Linguistic model marketplace launch

Q1 2018:
- Partnerships with top blockchain companies (Status, SONM, Tierion, Oraclize)
- Testing and launch of a 2nd platform language (English)
- Scaling
- Premium accounts
- Launch of the adaptive delegate rewards formula
- Patents and legal work

## THE TEAM

***Victor Nosko: CEO, founder, AI, data scientist.*** Higher education – Southern Federal University. Winner of various university competitions, winner of Startup-Sabantui, a resident and graduate of the Southern IT Park (Rostov-on-Don, Russia). The founder of GraphGrail.

Victor is a Python developer who understands the Django framework. He also understands the stack of technologies for language processing: NLTK + Celery + Pymorphy2 + GLRparser, etc. Experience with Google TensorFlow. A specialist in information retrieval, engineering of linguistic attributes, and vector models (doc2vec, word2vec). Databases: PostgreSQL.

5 years of experience in the implementation of grants from scientific funds (RFFI, RGNF) and internal grants from YUFU. Proficient in the development of algorithms, software implementation, creation of a product meeting the needs of the market, business as a whole. Negotiations with customers. Supervised and worked in sales at a marketing agency, the Electoral Committee RO, and the Center of Expertise. Developed a service for a complex semantic classification of large texts.

***Sergey Litvinov: cofounder, developer.*** Higher education – Southern Federal University. Winner of the competition named after the academician I.I. Vorovych. Winner of the SCAGS Intramural Competition for Young Researchers. A resident and graduate of the Southern IT Park (Rostov-on-Don, Russia).

Cofounded the GraphGrail project. He is also a designer and a system analyst. He is a Python developer who understands the Django framework. He also develops data parsers and the software implementation.

5 years of experience in the implementation of grants from scientific funds (RFFI, RGNF) and internal grants from SFU. Participated in the development of InSourcing, a database of unique scientific equipment purchased by SFU within the framework of a development program to distribute equipment to third-party commercial customers (2009: developed a structural model of operation, database schema, equipment questionnaire, and logo).

***Alexander Borodich: Venture investor, CMO*.** Alex is a futurist, angel investor, and a serial entrepreneur. He is the founder of the elite club VentureClub. Previous projects include MyWishBoard, MyDreamBoard, and SuperFolder. His angel investments include Future Action, where he is the Chief Dreams Officer and controlling partner. Founder of FutureLabs Future Laboratory and the crowd investment platform VentureClub.ru. Alex is an investor in more than 70 projects.

Alex was previously the CMO of the Mail.ru Group and Acronis. He has been an entrepreneur since 2010. He is also Director of the Economics and Mathematics School at Moscow State University, where he has taught a course on the development of creative thinking and entrepreneurial skills since 2003.

Alex received his MBA from the Stockholm School of Economics in 2007. He graduated from the Moscow State University of Electronics and Mathematics and was educated in marketing at the State University of the Higher School of Economics. He also holds a US patent on assessing the effectiveness of information dissemination within social networks.

Alex was a finalist at MobileBeat 2012 (San Francisco). He started his career as a web developer in the American company ThinkWave. In 2002-2003, he acted as the head of e-commerce in the research and consulting company Direct Info. From 2003-2005, he was engaged in online marketing at the company MAR Consult. In passing, he was also engaged in his own projects: FutureLabs, MyWishBoard and others.

***Zachar Ponimash: AI, data scientist, developer.*** Zachar is a specialist in the development of strong artificial intelligence. He is a C# developer with prior projects in machine learning, neural networks, mathematics, evolutionary computing, biology and physics.

Zachar has experience in developing an AI framework. He has previously worked on chat bots, signal processing, computer vision, and text analysis systems, including logical inference modules. He also has

experience in symbolic computing, 1D and 2D signal recognition, developed a chat engine (using TCP/IP) and created a simple 3D game from scratch using XNA (though without the engine.)

Zachar has scientific publications in peer-reviewed journals.

***Dmitry Strelnikov: Blockchain and Fullstack developer.*** Dmitry is a specialist in information technology, Internet, and telecom sectors.

Full-stack developer. Wrote the REST API for mobile applications (Node.js); created admin panels. Development experience includes a new file-image microservice, custom clustering of the map with animation. Along with a team, Dmitry rewrote most of the front end part of the portal.

Full stack experience in CSS3, HTML5, JavaScript, adaptive layout, cross-browser layout, Git, Node.js, Webpack, AngularJS, React, and MongoDB.

***Ilya Bredikhin: Mathematician, algorithms.***
Higher education: Faculty of Mathematics, Mechanics and Computer Science SFU. A specialist in differential equations.
Specialization: differential equations of convolution type in functions with exponential behavior at infinity.

Ilya has more than 6 years of experience in teaching and tutoring. He prepared more than 50 people for the successful passing of the Unified State Examination.

Ilya is a qualified mathematician. His range of interests includes Mathematical analysis, linear algebra, analytical and differential geometry, differential equations, theory of functions of complex variables, functional analysis, probability theory and mathematical statistics, and algebraic coding theory.

## TERMS AND CONDITIONS

This document is for informational purposes only and should not be considered as an offer to sell shares or securities using the GraphGrail Ai platform or any other affiliated company.

GraphGrail Ai tokens do not grant the right of control.

Owning GraphGrail Ai tokens does not give their holder the right of ownership or the right to property in GraphGrail Ai. While the community's opinion and feedback can be taken into account, GraphGrail Ai tokens do not give their holders any right to participate in decision making concerning the development of the GraphGrail Ai ecosystem. GraphGrail Ai tokens can be used to purchase items in stores included in the GraphGrail Ai ecosystem, as well as to pay for contextual advertising or premium accounts.

No guarantee of income or profit

All the examples of income and profits calculation used in this document are given for demonstrative purposes only or for showing industry averages and do not constitute a guarantee that these results will be obtained according to the marketing plan.

Regulatory uncertainty

Blockchain-related technologies are subject to supervision and control by different regulatory bodies around the world. GraphGrail Ai tokens may fall under one or more inquiries or actions on their part, including but not limited to imposing restrictions on the use or possession of digital tokens such as GraphGrail Ai tokens, which may slow or limit the functionality of the system or the process of purchasing GraphGrail Ai tokens in the future.

GraphGrail Ai tokens are not an investment

GraphGrail Ai tokens are not an official or legally binding investment of any kind. Due to unforeseen
circumstances, the objectives set forth in this document may be amended. Despite the fact that we intend to reach all the goals described in this document, all persons and parties involved in the purchase of GraphGrail Ai tokens do so at their own risk.

Quantum computers

Technical innovations, such as the development of quantum computers, may pose a danger to cryptocurrencies, including GraphGrail Ai tokens.

Insufficient use

Despite the fact that GraphGrail Ai tokens should not be considered as an investment, they can gain in value in the course of time. They may also fall in value if they are not actively used in the GraphGrail Ai system.

Risk of loss of funds

Funds collected during the ICO procedure are not insured. In the event of loss or loss of value, there is no private or public insurance representative whom the buyer could address.

Risk of Failure

It is possible that for various reasons, including but not limited to the failure of business arrangements or marketing strategies, that the GraphGrail Ai ecosystem and all subsequent marketing activities related to the funds collected during the ICO procedure may be unsuccessful.

The risk of using new technologies.

Crypto tokens, such as GraphGrail Ai, are a fairly new and relatively untested technology. In addition to the risks mentioned in this document, there are additional risks that the GraphGrail Ai team cannot predict. These risks may emerge in other forms rather than those indicated here.

Integration

This Agreement constitutes the entire agreement of the parties with respect to the subject matter hereof. All previous agreements, discussions, presentations, warranties, and conditions are combined in this document. There are no warranties, conditions or agreements, express or implied, between the parties, except as expressly provided in this Agreement. This Agreement may be amended only by a written document duly executed by the parties.

Disclaimer of Warranties

You agree that your use or inability to use GraphGrail Ai tokens is solely at your own risk and you remove all responsibility from the GraphGrail Ai Foundation. Since the date of issue, GraphGrail Ai tokens will be sent to you without warranty of any kind, either express or implied, including all implied warranties of commercial value for a particular purpose without violating anyone's intellectual property rights. As some jurisdictions do not allow the exclusion of implied warranties, the above exclusion of implied warranties may not apply to you.

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