Dolphin Blockchain Intelligence

an open-source platform for collaborative crypto-asset investment analysis
version 0.9

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ABSTRACT. Dolphin BI is a crypto-asset investment analysis platform. It enables users (with roles Subscribers, Authors and Experts) to establish efficient collaboration in order to enhance ICO investment analysis. The platform consists of apps/widgets and corresponding data providers which can be developed by independent authors and plugged into the platform. The platform combines advantages of data visualization, automatic analysis (machine learning) and expert analysis approaches. Reputation of Experts, rating of Author's apps/widgets and voting influence of Subscribers are calculated in an auditable smart-contract which has a transparent update policy. Reward is distributed to Authors and Experts according to their contribution to the platform.

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1. Intro and motivation

A crypto-asset investment market is growing at a high rate and more money is coming into the market [1] [2]. Because of technical complexities and usually disruptive nature of new crypto-asset projects it's often problematic to evaluate them and predict their success and profitability for investors for a reasonable timespan and with good quality. ICO crowdfunding investment is usually launched at early stages of a startup and associated risks are shared between founders and backers. Even after the ICO finishes there's usually a "death valley" period when coin/token price hits the floor, and entering at this stage can be either a great profitable long trade or a great mistake.

Crowdfunding lowers the entry barrier which results in both opportunities and threats. Low entry costs allow anyone with a bright mind to elaborate on their idea and make a product or service proposal to get an almost instant market response. However, exaggerated expectations and hype blow up market bubbles and attract scammers in search of easy money. Lower barriers bring explosive growth in quantity, while the quality decreases.

A growing number of startups choose funding through an ICO rather than classic crowdfunding on platforms such as Kickstarter or Indiegogo [3]. And some disruptive innovations can only be created through crypto-asset crowdfunding.

In traditional economics there are organisations that estimate risks and profitability of investment in a startup or in an already established company. Angel investors, accelerators, investment banks and funds do this without a conflict of interests: these organisations are risk-takers and aren't inclined to overestimate profitability or underestimate risks of investing in a startup or company. Also, there are traditional credit rating agencies such as S&P, Moody's and Fitch, and independence of their evaluations is solely based on fear of loss of reputation, and such fear isn't always a great motivator [4].

In crypto-asset crowdfunding an independent investor or even an investment fund cannot analyse the full spectrum of ICOs because in contrast to traditional multi-level startup filtering (incubators, angels, accelerators and different rounds of investments) there's a flat structure: every ICO is instantly visible to any investor after the announcement and thus a lack of time for analysis is already a significant challenge and with the growth of ICO quantity this becomes a significant problem. Only obvious frauds or obvious "unicorns" are distinguishable from the first glance, but a lot of possibly successful projects will be devoid of investors' attention.

As in traditional economics some crypto-asset rating agencies are already established. But the cornerstone of crypto-economics is trust, which takes long to build up and requires any conflict of interests to be absent. The problem is that free-of-charge rating always places the payer behind the curtains. And, of course, an idea of decentralized economics contradicts the existence of centralized organisations that rate ICOs.

We expect that all investors want to estimate risks and profitability efficiently and we believe that they could share results of analysis and create a win-win scenario.

Right now, a lot of investors already share results of their analysis in different forums and chats, but they are usually full of noise and one must apply a lot of effort to manually extract the useful information. To reduce noise, small chats are established that place entrance barriers (which in turn reduces variety of opinions) and experts are communicated directly (which requires for each investor to build their own web of trust). As a consequence, investors must rely on very inconvenient and inefficient tools to collaborate on crypto-asset analysis.

2. Problem definition and proposed solution

During the Presale, ICO and post-ICO stages there are many characteristics on an ICO that should be taken into account by an investor.

Here's some of them:

Problem and blockchain: is this project interesting?
1. Whose problems does this project solve?
2. What customer's problem does a new crypto-asset project try to solve?
3. What kind of blockchain technology has been chosen and why?
4. Is this technology suitable for solving a customer's problem?

Code: is it worth-while?
5. If any source code already exists then what is the quality of this code?
6. Has anybody already done source code audit?

How realistic is the roadmap?
7. What kind of resources does the project possess now?
8. What resources don't suffice?
9. Is the evaluation of the timeline horizons adequate to the present resources?

How good is the development team?
10. Who are they?
11. Are there good developers with relevant skills to implement a desired technology?
12. Are there subject matter experts?
13. What can underpin experience of the team?
14. What are the other projects they have participated in?
15. What is the motivation of the team?

Market: is it interesting?
16. Does the market exist?
17. What is the size of the market (TAM, SAM, SOM)?
18. How many competitors are already on the market or on the way to the market?

How good is the business model?
19. How will the company earn money?
20. Why should the token price rise?
21. Why will the development team be motivated to set and reach milestones?

Warranties: are there going to be any?
22. Will an escrow be used?
23. How and by whom will it be organized?

Does MVP exist?
24. Is it possible to test a prototype?
25. Is it usable?
26. Does it solve the core customer problem?

Coin/Token: is it worth-while?
27. What is the price of participation in the ICO for an investor?
28. How are ICO coins/tokens distributed among the development team, bounty hunters and investors?
29. Is there premine (if applicable)?
30. How many coins are premined?
31. Is development team motivated to keep the token price high?
32. What are the countermeasures against pumping and dumping strategies?
33. When is the crypto-asset scheduled to appear on exchanges? (и на какой первой)
34. Is it easy to become a market-maker and who is going to be one?

Coin/Token: should one keep it?
35. Does development move forward and meet its previously defined roadmap?
36. Does ICO crowdfunding payments distribution seem normal?
37. How much original code (i.e. not from third-party frameworks and libraries) is added to the codebase?
38. Does the team inform their backers on development progress and milestones reached?
39. What market rumors, sentiment indicators and mentions circulate regarding the crypto-asset?

Each characteristic takes time to evaluate. With quantity and complexity of crypto-asset projects growing, **potential investors will definitely suffer from shortage of time while evaluating all required characteristics or monitoring project activity. This could lead to missed opportunities or unjustified decisions and thus to a decline or loss of profitability.**

In April 2017 there were 29 ICOs simultaneously. In August 2017 already 91 projects have announced presale or ICO. Potential investor needs to analyze 3 ICOs per day and 7 days per week to analyze all these ICOs by its own.

So we propose a platform where the following approaches to enhance analysis speed could be proposed:
- automate the evaluation where it's possible (using machine learning and other techniques)
- provide decision-making support with visually-rich analytics
- specialization and division of labour where expert knowledge is required
- incentivize collaboration and knowledge sharing within a suitable platform
- provide a consensus forecast based on expert's evaluations

Automating the evaluation is possible for a lot of characteristics:
- investment curve analysis (detection of churning)
- classification and clusterization of whitepapers: find similar crypto-asset, detect industry and keywords
- gathering a team member's score on github
- gathering a team member's activity on github, slack, twitter etc.
- gathering project's code development metrics
- monitoring and sentiment analysis of social media (twitter/reddit/slack/bitcointalk posts)
- etc

Providing decision-making support with visually-rich analytics is possible for the following information:
- a time curve of funding amounts
- sentiment changes over time
- number of mentions over time
- etc

Specialization and division of labour means that *experts* take responsibility for evaluation of some characteristics. E.g. a known expert in Solidity programming language could make an audit of smart contract code, rate it and write a brief summary of analysis, a business analyst can review the business model and financial plan of the project, etc. The key challenge in such collaborative analysis is understanding how much can we trust to each expert.

Collaboration and knowledge sharing is a way to learn from each other and exchange the results of evaluations. In this case, trust is the key to successful collaboration.

In view of aforementioned techniques the following solution is proposed:
- to provide a platform for collaboration of investors and experts which allows to solve the discussed investor problem and gives experts an ability to monetize their knowledge
- to support development and deployment of community recognized automated evaluation tools by independent developers
- to provide an attack-resistant rating system for experts which is based on investors' evaluation of each expert's work and on automatic evaluations based on real world facts
- incentivize experts to collaborate and to share knowledge
- incentivize investors to support experts according to their contribution
- incentivize independent developers and researchers to create automated evaluation tools based on data provided by platform and to create their own data providers.

We also have a hope that if experts and authors are competing on the platform and investors rate them, then a community-accepted ICO standard will be indirectly defined. This provides a sustainable expansion of crypto-asset crowdfunding and as a result a creation of successful crypto-asset companies.

3. Platform design

We propose to create a platform where both automated analytics and sharing of expert knowledge can be applied to streamline crypto-asset analysis at each stage of ICO's lifecycle (incubation, presale, ICO, post-ICO) and to support potential investors decision making process.

Characteristic is a measure of an ICO which is evaluated by machine or by expert.

App/widget is a module which represents one or several characteristics in the user interface.

Dashboard is a personalized set of widgets that the user utilizes in their ICO analysis.

Data provider is an analytical service which is feeding apps and widgets with relevant data. Data provider will be implemented as containers (Docker or similar) which provide scalability and isolation.

The platform is divided into following parts:
- a set of smart-contracts that manage Experts' ratings, distribute reward and assign widget access rights for Subscribers (e.g. on pay-per-month basis). These smart-contracts are the foundation of the platform and are developed by Dolphin BI development team in tight cooperation with the platform community.
- data providers attached to apps/widgets. A data provider isn't a distributed part of the platform and it can be created by any developer who follows the platform development guidelines. However, we expect that data providers will be open-source software. First data providers (e.g. access to blockchain data) will be developed by Dolphin BI development team as open-source software.
- an end-user interface, which provides easy access to the platform's services. This interface includes a customizable dashboard with widgets, authorization and payment features, and contract upgrade voting feature. First end-user interface will take a form of website developed by Dolphin BI development team as open-source software.

3.1. The platform users

Our platform will create a value for the following groups of users:
- subscribers
- experts (investment analytics, code auditors etc)
- authors (third-party developers)

So we distinguish the following user roles[1] on the platform:

Subscriber is a person or company who wants to have access to crypto-asset evaluation and make a profitable investment using acquired knowledge. Subscriber pays a monthly fee

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[1] Naming and definition of roles are based on the work of Paul Sztorc [5]

to access the platform's widgets and receives corresponding month-term private access keys. This fee is transparently distributed between Authors and Experts with a set amount going to platform developers.

Expert is a person or company who seeks to monetize his abilities in characteristic analysis, thus contributing to crypto-asset evaluation. Expert accumulates reputation rating, which influences distribution of rewards.

Author is a person or company who proposes a new characteristic or set of characteristics (and corresponding widgets and data providers) to be evaluated automatically or by experts. Author acts as an entrepreneur, so they take upon themselves the total lifetime economic costs of creating, promoting and maintaining a widget. Author expects to benefit from widget's popularity, returning their investment with profit margin. Author can create app/widget which is based on existing data provider or create custom data provider. Custom data provider can be deployed directly on the Dolphin BI platform (like in Amazon EC2, Azure or Heroku) or on it's own facilities. The second option is useful to connect an existing service to Dolphin BI platform.

A user of the platform can combine any combination of roles mentioned above. Role is associated automatically according to user's behaviour. To get Subscriber role a user should start pay platform access fee. To get Expert role a user should start posting evaluations in expert widgets. To get Author role a user should create their own Widget. If an Expert or Author user has no Subscriber role then the user can only see part of the information published on the platform.

3.2. The platform mechanics and user interaction

The following design principles are implemented to structurize the collaboration process:
- a list of all crypto-assets (and their ICOs) and base information on an ICO is managed by the platform community (like in Wikipedia). So any Expert can add new crypto-asset to the platform (as a spam countermeasure if Expert has initial reputation then adding is pre-moderated by Experts with minimum required reputation)
- new characteristics and corresponding widgets are created by Authors
- characteristics can be automatically calculated or manually evaluated by Experts
- for automatable characteristics Author could designs an appropriate widget and connects it to a data provider, which may be developed by Dolphin BI development team or by Author. In both cases Author count on receiving a reward for widget usage.
- for manually evaluated characteristics Author defines evaluation principles and methods. Then they invite Experts to evaluate characteristics according to these principles. Subscribers then cast votes for each Expert evaluation, which are used to calculate reward distribution.
- Ratings of Experts are transparently calculated by the platform smart-contract according to Subscribers' votes. There are techniques in place for prevention of game-theoretical attacks on the reputation system.

Two groups of widgets are implemented: for automatic (by machine) and manual (by expert) analysis.

Types of widgets for automated analysis:
- data visualizations (e.g. crowdfunding payments curve, payment amount distribution etc)
- information extraction using predefined algorithm (e.g. monitoring of development team github activity, displaying development team github rating or the project's mentions in social media)
- information extraction using machine learning (e.g. social networks sentiment analysis, whitepaper clustering to detect similarities in projects and recommend projects that might be interesting to Subscribers, etc).

Types of widgets for manual analysis:
- review widget (Experts write free form reviews which are accessible through the widget)
- rating widget (Experts score projects according to widget evaluation principles and methods: e.g. for each whitepaper the following characteristics can be measured by Experts: quality of idea, a market that the project targets (competition, depth, structure, etc), the business model, development team's qualification and so on. The Expert attaches comments that justify their scores.

For each widget Author specifies one or more crypto-asset life-cycle period (incubation, presale, ICO, post-ICO) that the widget targets.

There are two types of Dashboards: Overview and Single asset.

A dashboard widget can be designed to show overall market data (Overview widget) or data for a single crypto-asset (Single asset widget). A user can stick the latter one to Overview Dashboard to always show data on a specified ICO. Any number of widget copies can be added to Overview Dashboards and sticked to different assets. For Single asset Dashboard only Single asset widgets can be used but when the user navigates between crypto-assets in the UI, widget data is automatically refreshed to reflect information on the chosen crypto-asset. So it describes two different use case scenarios: monitor and control some crypto-assets (using of Overview Dashboards) and navigating through crypto assets (Single asset Dashboards).

New data cannot be entered into Presale and ICO widgets if the ICO has already ended.

Access to apps/widgets can be included in the platform access fee (all "free widgets") or a widget can have its own subscription fee ("paid widgets"). Subscriber is to pay monthly subscription fee (access fee) to use the platform. With this fee Subscriber gets access to some apps/widgets which don't require extra payments. But some Authors can set their app/widget to require extra monthly payments depending on Author's expectations and marketing model. Packages of apps/widgets can also be composed with a reduced total price.
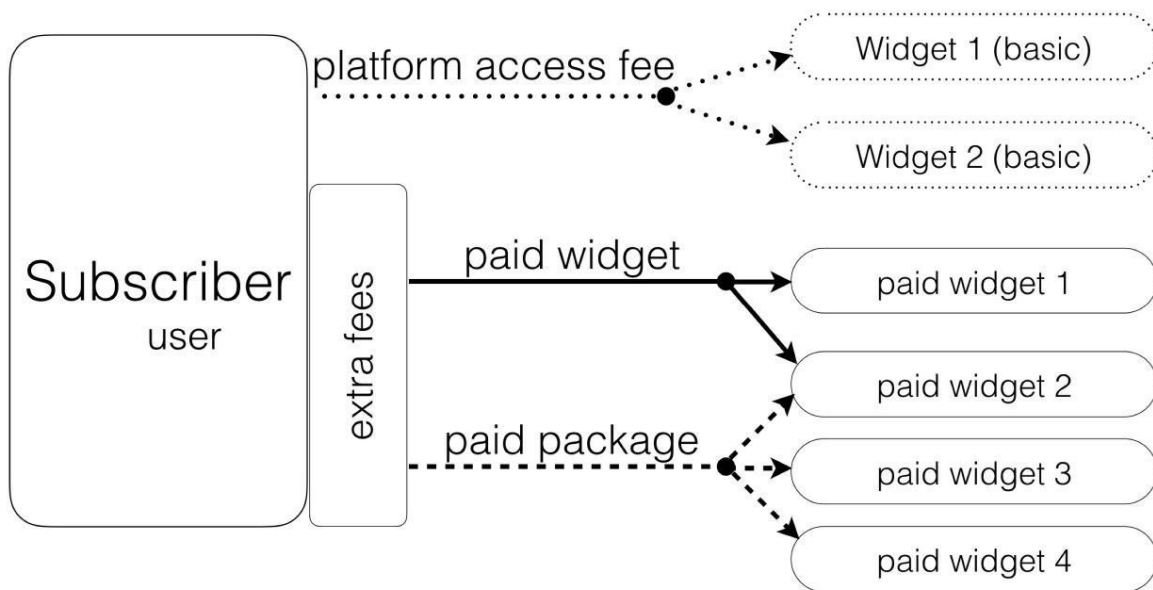
3.3. Rating system

The rating of an Expert user is calculated based on Subscriber votes. Each Subscriber has their own 'voting influence' which is recalculated each month as a sum of spendings last month and average daily balance during last month. This sum is powered into a constant factor of 1,5 to boost voting of Subscribers with larger spendings of platform tokens (formula 1 in Appendix 1). We expect to lower this factor down to 1 and even convert power function into logarithm function as more Subscribers come to the platform to provide more decentralized voting. At the start of the platform we will have curators with Subscriber role. After stabilization period curators become less powerful. This change will be made only if the platform community will support this change to voting function.

Subscriber user 'voting influence' is recalculated every month and is used to calculate Expert ratings. Expert rating is calculated according to Subscribers scores of Expert posts in manual analysis widgets.

Here is a representation of what a manual analysis widget might look like (this is an example of Expert evaluation widget):

Idea	Team	...	Business model	Expert comments	Expert	Expert total rating	Rate this analysis
Bigger is better	*Bigger is better*		*Bigger is better*				
•••••	••••		•••••	read more	John Doe	4,5 out of 5	★★★☆☆
•••••	•••		••••	read more	Charlie Hoe	2,5 out of 5	★★★★☆
•••••	••••		••••	read more	Wu Wong	newbie	★★★★☆

Figure 2. A representation of a manual analysis widget.

It consists of following parts:

- one or several characteristics
- link to the Expert's comments/review
- Expert name
- Expert overall platform rating
- a control element to rate Expert contribution

Widget rating for an Expert is calculated as a weighted average of all Subscribers votes with their voting influence as weights (formula 2 in Appendix 1). This rating is only calculated if Expert have received at least 2%[2] of votes in a widget for a crypto-asset. This allows to cut off votes cast by sybil Subscribers. Otherwise the rating is set to zero.

There is UI functionality in place for promotion of newbies. It randomly places a newbie Expert into the spot among top-10 posts in a widget (where an Subscriber is likely to notice them).

An **Expert average rating** is calculated as the average of all received scores from Subscribers in the last 3 months (formula 3 in Appendix 1). This rating exists to ensure that reward distribution is not affected instantly on Expert rating change.

Expert average rating is set to zero at the moment of Expert's sign up. It can be recalculated to non-zero value only after at least one month of their contributions to the platform. So a newly registered Expert will have to contribute not for reward, but to establish a reputation.

To monthly distribute a reward between Experts in a given widget for a given crypto asset the following algorithm is used:

1. distribution basis for each Expert is calculated. It equals to harmonic mean of Expert's Widget rating and Expert's average rating multiplied by the natural logarithm of the number of votes given for Expert (formula 4 in Appendix 1).
2. reward is distributed to each Expert proportionally to distribution basis. Share of Expert in reward is calculated as distribution basis calculated for Expert divided by sum of all Expert's distribution basis calculated for a given widget for a given crypto asset (see formula 5 in Appendix 1).

All this is used to implement an attack resistant rating system.

3.4. Reputation system attacks and defence techniques

The following reputation system attacks are well-known and could be used to damage the platform's economy and/or functionality [6]:
- **Self-promoting Attack.** The attacker falsely increases their own reputation. A typical example is a so-called sybil attack[6], where an attacker subverts the reputation system by creating a large number of pseudonymous entities and using them to gain disproportionately large influence or rating.

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[2] Research will be done to set this value not as a constant, but as a variable which is recalculated dynamically according to the rule: the cost of attack should be bigger than possible profit. By the main TGE and during MVP development this feature will be designed.

- **Whitewashing Attack.** The attacker uses a vulnerability in the system to reset their reputation. This attack usually exploits formulae that are used to calculate the reputation result.
- **Slandering Attack.** The attacker reports false data to lower the reputation of other participants. It can be achieved both by a single attacker or a coalition of attackers.
- **Orchestrated Attack.** The attacker coordinates their efforts and employs several of the above strategies. One famous example of an orchestrated attack is known as an oscillation attack.
- **Denial of Service Attack.** The attacker prevents the calculation and distribution of reputation values in reputation systems by using Denial of Service method.

Self-promoting Attack. An attacker could promote own Experts users to provide them more reward or to use this Experts to give more good evaluations for particular ICO. If the smart-contract have no flaws then the only way to falsely increase an Expert reputation will be using of sybil Subscribers to rate Experts. One sybil Subscriber user is not enough because the aforementioned threshold on number of votes is set for each widget. The expert does not qualify for revenue distribution if they have not passed this threshold. So for each sybil Subscriber an attacker should purchase at least one-month access.

There's two cases which should be considered:
- in case of scam ICO the expected profit of attack can be high and compensate the costs of creating sybil Subscribers
- because of the Compensation program for Subscriber users for the first two years (see 4.3 "Business models and token price") the cost of attack becomes lower (in any case an attacker should buy DoBI and refund will only be available by the end of month)

We address these with the following countermeasures:
- average Subscriber rating is used which takes into account evaluations by Expert of different crypto-assets
- a special Machine Learning algorithm will detect groups of users with similar behaviour to detect possible sybil attack. During the Compensation program and maybe afterwards a curator will apply penalties to these Experts
- an Expert with a verified profile will have a large more rating and reward.

Whitewashing Attack. This attack is used to reset a negative rating in systems where a new user's zero-rating is better than a negative rating of an old user. The platform doesn't utilize negative ratings, so this type of attack isn't applicable.

Slandering Attack. Can be used to decrease other experts' rating to improve the position of an affiliated expert in fee distribution. To defend against this type of attack the same counter-measures as for **self-promoting attack** are used.

Orchestrated Attack. All of the above techniques are used against this type of attack.

Denial of Service Attack. Because the rating is recalculated by the smart-contract every month, the following vectors of a DOS attack can be chosen by the attacker:
- use smart-contract code vulnerabilities

● use smart-contract platform vulnerabilities

To reduce the chance of a first type of attack, a public audit of smart-contract must be held and bounties for bug-tracking must be rewarded. The attack of the second type can be mitigated by choosing a time-proved smart-contract platform.

3.5. Technical architecture

There are three primary parts in the platform's architecture:
1. Presentation layer (UI with widgets)
2. Data providers
3. Smart-contracts for token management, paid access control and reputation management.

The user interface is independent from data providers and smart-contracts. For the first release of the platform, only a website will be developed. Development of mobile apps can be later funded from the development fund.

A data provider is an independent service that delivers data to a widget. It can be a traditional database solution if it requires to store a lot of data, perform a lot of calculations or communicate with other internet resources. Or it can be a smart-contract if the respective functionality is required. Also, a data provider can access data from another data provider. When an author develops a new widget, they must decide whether to use an already existing data provider or create a new one. Data provider will be implemented as containers (Docker or similar) which provide scalability and isolation.

A set of smart-contracts is a key part of the platform. It brings transparency to revenue distribution among participants.

Data flow is performed on the platform as follows:
1. A user calls a widget, which, in turn, requests data from a data provider
2. The data provider calls a smart-contract to verify whether an access to the widget can be granted to the user (read only call).
3. The smart-contract checks the user's subscription status and responds with a result, granting or denying access request.
4. If the smart-contract responds that access is granted, then the data provider transfers requested data to the widget.
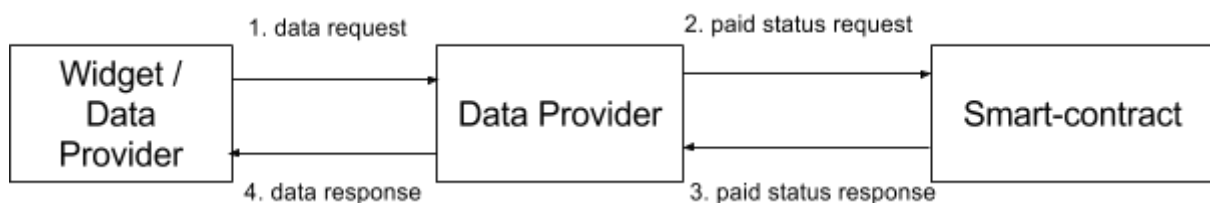

Figure 3. Data flow and smart-contract communication

3.6. Tokens and reward distribution

DOBI is an utility digital token which is used inside the platform. The token will be used by Subscriber to get access to the platform's features. One-month access can be bought for a fixed amount of DOBI (exact amount is set according to economic model). For Subscriber this payment is obligatory and unlocks access to the platform's standard widgets. A user that pays the platform access fees gets an Subscriber role. Otherwise the user can only assume the role of Expert or Author. Expert is allowed to post their evaluations in widgets, but they cannot see other Experts' posts. Author is allowed to create and publish their own widgets but they cannot use other Authors' widgets. Any automatic widget displays no data until the user gets an Subscriber role.

Both Experts and Authors will receive DOBI as a reward which is based on their contribution to the platform:

- for Author amount of DOBI depends on popularity of Author's widgets. The platform will count number of views and interactions with widgets to understand widget popularity. Author doesn't need to hold DOBI to receive a reward.
- for Expert amount of DOBI depends on number and quality of their evaluations and reviews in manual Widgets. Quality is evaluated by Subscribers and automatically (where possible).

So for an Expert the way to use the platform without payment is to participate in collaboration on crypto-asset analysis by evaluating characteristics and writing reviews. It allows an Expert to gain rating and start earning reward with DOBI tokens, which may be used to pay an access fee.

Similarly, for an Author the way to use the platform without payment is to develop their own widget, promote its usage and spend part of the revenue on the subscription fee.
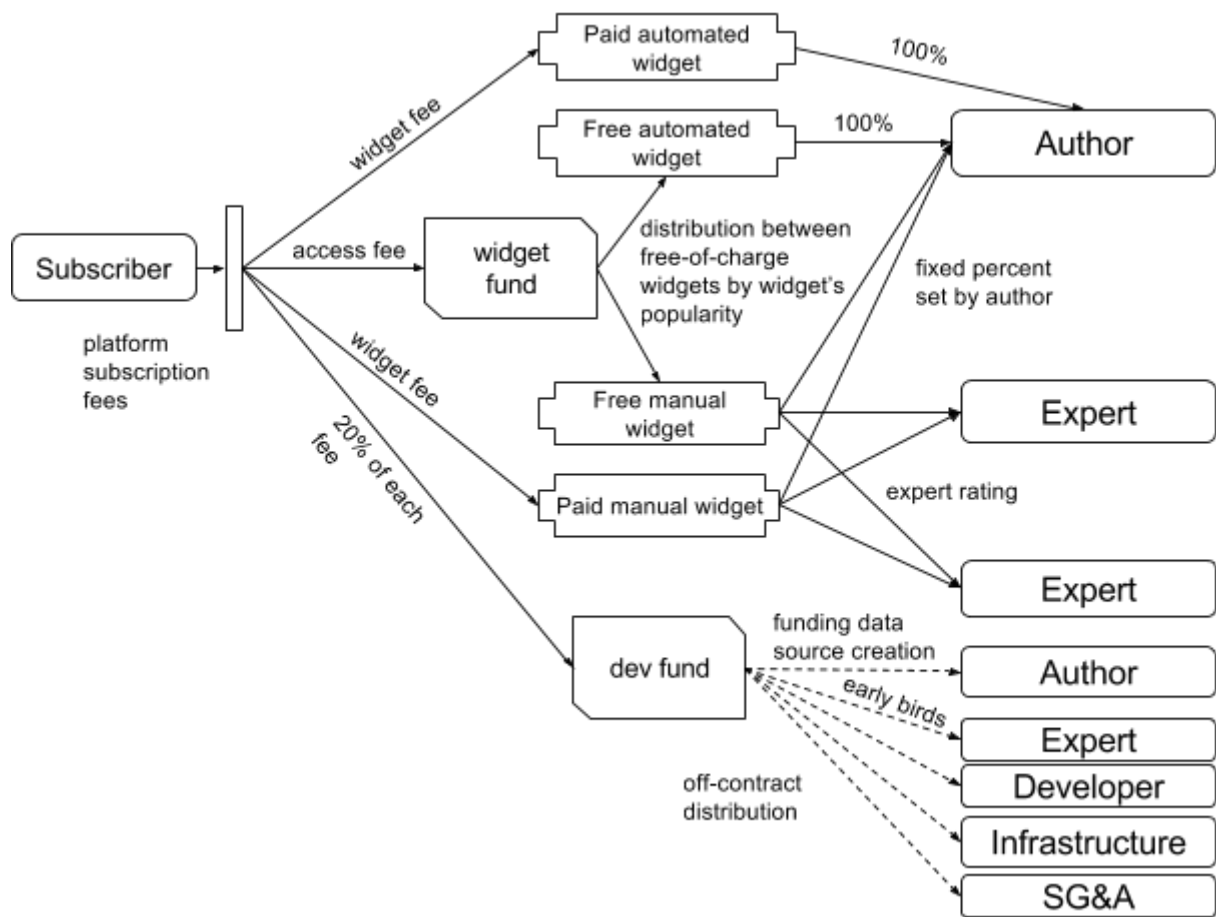
Figure 1. Reward distribution scheme.

The monthly fee distribution scheme is based on the following principles, which will be implemented through a set of smart-contracts:

- Subscribers are funding the platform economics.
- Subscribers must pay a monthly platform subscription fee, but authors may set their own widget subscription fees.
- 20% of all revenue from the fees is transferred to the development fund.
- Development fund is used for several goals: development, infrastructure maintenance, subsidies for promising authors and experts, incentive payments to bring famous blockchain persona to the platform.
- 80% of the monthly platform subscription fee will be transferred into the widget fund.
- At the end of the month the widget fund is distributed among free widgets according to their popularity (number of days per month in which subscribers have seen crypto-asset data in the widget on their dashboards) and then
  - for automatic widgets the fee goes to the widget's author
  - for manual widgets a fixed percent of the fee goes to the widget's author (the value is set by the author) and all remaining funds are split among crypto-assets proportionally to number of days per month in which subscribers have seen the widget with crypto-asset data on their dashboards,

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and then among experts for each crypto-asset according to their reputation. In other words, the most popular widgets and crypto-assets receive most of the funds.

- At the end of the month 80% of a paid automatic widget subscription fee revenue is transferred from contract's account to the account of the widget's author.
- At the end of the month 80% of a paid manual widget subscription fee revenue is distributed among the widget's author and experts and transferred from the smart-contract's account to authors' and experts' accounts. The author gets a fixed percent that they defined when a widget was created, and the remaining part is distributed among experts who posted their evaluations in the widget.
- Subscribers can freely add and remove widgets from their dashboards. For a paid widget a fee will be charged from subscriber's account proportionally to the number of remaining days in the month. When the widget is removed from the dashboard, the fee is refunded back to subscriber's account proportionally to the number of whole remaining days in the month.
- Subscribers can vote for experts in manual widgets. This is the main way for an expert to get rating.

For this scheme the following assumptions are made:
- subscribers are motivated to vote because they pay for the service and want to receive quality information.
- authors are motivated to develop their own widgets and promote their use because they want to profit from subscription fees.
- experts are motivated to evaluate as many crypto-assets as possible and create high quality contributions because they want to get a higher rating score and, subsequently, a bigger fraction of revenue.

3.7. Dual-token issuance

We plan to activate DoBI tokens simultaneously on the Waves platform and the Ethereum platform as MobileGo has committed [10].

The DoBI token will have total supply created on both blockchains. Tokens changed for ETH digital tokens in ETH platform will be released to user's accounts on Ethereum and automatically locked for further change in Waves. DOBI tokens changed for Waves digital tokens in WAVES platform will be delivered to your Waves account and automatically locked in Ethereum smart-contract.

By the time of main token activation there will be a smart-contract and a gateway to move tokens between these blockchains. It could be usable to move earned DoBI tokens from Dolphin BI account to Waves DEX to easily change to other crypto digital tokens or fiat. You can receive DOBI digital tokens by using your credit card on Waves platform.

4. Economic model

4.1. Market size

TGE is a public event where a certain project sells some of its tokens - tokens crowdsale. As a matter of fact this event is rather related to crowdfunding than to the standard stages of venture funding.

A regular venture funding is traditionally held in two formats: 1) it can either be credit financing, or 2) selling company shares. In first case, the project needs to return the lent money and pay interest so the subscriber is mainly attracted by this interest. In the second case the financing is not refundable, however the project founders tear away shares of their company. So the venture subscriber acquires part of the business value.

Within the framework of TGE the project founders derive money not for share of a company and they do not have to return this money either. All founders' obligations lie in the token or better say in their claim right. Virtually, adherents of the idea and enthusiasts swap their money for some promises, manifested in a token. This situation looks pretty much like crowdfunding, when money is accumulated for a promise of the project, to allow people get the conditional commodity.

Crowdfunding is generally taken on dedicated platforms and is usually not perceived as an investment. However, simplicity of the process and variety of projects that choose such a way of funding are attractive for a huge audience. Two major crowdfunding websites are Indiegogo and Kickstarter. The audience of these platforms is around 15 million people. Variety of projects is a distinctive feature of an ICO. And simplification of ICO participation process is only a question of time. However, the number of cryptocurrency investors is still relatively small but it is aspiring to these amounts with mass adoption of the phenomena and the technology.

We can definitely state that cryptocurrency and blockchain interest are picking up momentum. Two most popular resources on crypto world are: Coinmarketcap.com - an information site with actual cryptocurrency rates information. Bitcointalk.org - a forum to discuss all topics on cryptocurrencies and blockchains. Coinmarketcap.com has over 50 million visitors in last month[3]. Bitcointalk.org has over 25 million visitors in the last month[4].

According to Cambridge Center for Alternative Finance the current number of unique active users of cryptocurrency wallets is estimated to be between 2.9 million and 5.8 million in 2016 [8]. On the one hand the number of wallets is always more than number of users. On the other since the beginning of 2017 the audience of cryptocurrency and blockchain media has increased by several times [4] [5] [6] [7]. So it wouldn't be an overestimation to appraise the total

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[3] https://www.similarweb.com/website/coinmarketcap.com
[4] https://www.similarweb.com/website/bitcointalk.org
[5] https://www.similarweb.com/website/cointelegraph.com
[6] https://www.similarweb.com/website/steemit.com
[7] https://www.similarweb.com/website/coindesk.com

number of users who can probably invest with cryptocurrency to be between 3 and 4 million. We assume this amount as current total addressable market (TAM) for our platform.

Poloniex cryptocurrency stock exchange (USA) is publishing every minute the number of user trading online. During the last year this amount has raised 14 times and now equals to 60'000 users on average. According to Slacknation's blog on Decentralized Today the number of Poloniex online users is 3% of the registered ones[8]. So we can assume that the number or registered Poloniex users is close to 2 millions.

Bitcointalk.org is a major place where people are looking for independent information about ICOs. They already consume information similar to ours. Bitcointalk.org has over than 650'000 of registered users[9].

So we can assume that Serviceable Available Market (SAM) is between 650'000 (bitcointalk.org registered users) and 2'000'000 (Poloniex registered users) users.

There's 60'000 people online at Poloniex. And our estimation of average number of users participated in huge ICOs (>10 MUSD cap) which was based on Ethereum smart-contracts is 21'000. Also according to Tezos' newsletter (which was made when Tezos has experienced problems with subscriber's accounts on ICO website) the number of registered subscribers of Tezos ICO was over 24'000 people. So our the estimation of Serviceable & Obtainable Market (SOM) is between 21'000 and 60'000 of people.

According to our statistics our potential users are probably men at the age between 25 and 45 who are interested in investments in cryptocurrency and crypto assets.

The basis of our economic model is number of users. This factor is a key. Success of Dolphin BI platform depends on how fast we can increase this characteristic to possible market maximum.

It is significant that subscribers in Dolphin BI TGE and our first users are mostly the same audience. We set as a target to bring 7'000 monthly active users in the first year since Dolphin BI platform hits the road and to 15'000 by the end of 2019. This target is absolutely realistic because even today 60'000 users is an upper bound of SOM. An optimistic estimation could be 4x higher.

4.2. Supporting the first users

Our first users-subscribers are people who invest in our project. They will be both users and subscribers for real. The person who bought DoBI gets an access to the platform, that is, becomes its user. And since it is crucial for us to attract the first 15,000 users, we provide fundamental advantage for them: the use of the service should be free of charge! We want the platform to start fully functioning from the first days, so the first users will pay for the service in DoBI as well as all the others. But due to the **Compensation Fund**, we will

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[8] https://decentralize.today/250-users-online-growth-for-poloniex-ytd-519203e1836e
[9] https://bitcointalk.org/index.php?action=mlist;sort=realName;start=659160

reimburse them for the spent of DoBI. With this scheme, despite the fact that the use of the service will be free, the experts will still receive a reward.

Special funds for support are necessary for forming a community of subscribers and ICO experts on our platform. Community is a foundation for the development of the institution of ICO.

A community can be formed only if its members are interested in it. So we attract subscribers with a convenient and useful service which will be free in the beginning due to the Compensation Fund. We attract experts and authors who will be able to earn money for their knowledge, and in the beginning we are willing to pay a scholarship as a form of reward within the framework of Support Program.

How does Compensation Fund will work?

Let's say Nick spent 75 DoBI on the platform in June 2018 (he paid for an access to the system 5 DoBI and spent 70 DoBI on additional widgets). We fix his costs at the rate 1 DoBI = 1 USD, thus we have to compensate him 75 USD. We determine the rate of ETH for June 2018 for the last day of the month and then send to Nick's wallet the amount in ETH equivalent to 75 USD. Thus, for Nick service becomes free if he has bought his DoBI at TGE at the rate of 1 DoBI per 1 USD!

Compensatory payments looks similar in their content to a well-known model called "buy-back". It is when the project's founders pledge to buy their tokens back at a certain rate. However, here there is a fundamental difference: we compensate only DoBI spent on the service. Thus, we give people the opportunity to use the service for free and at the same time support of DoBI rate. We call this mechanism "DoBI back".

We compensate expenses at the rate 1 DoBI = 1 USD. It is no use for the person to sell DoBI in the market if he or she can get ETH anyway and use the service. At least it does not make sense to sell for less than 1 USD. There is only one case when it is reasonable to sell DoBI - it is when the rate is higher than 1 USD. That's exactly what we need! Unfortunately, if a user buys DoBI at a rate more than 1$, we will compensate only a part of the cost, but "DoBI back" program is created for those who took part in TGE of Dolphin BI and bought a DoBI for 1 USD.

What should be the size of the Compensation Fund?
We figured that if we collect a 15 MUSD Compensation Fund, we will be able to provide free service to the first 15'000 users by 2019. And at the same time the DoBI rate should be no less than 1 USD thanks to "DoBI back". The increase in the Compensation Fund by 1 MUSD allows us to provide a free service for 1000 additional users until 2019. If we collect 50 MUSD in the Compensation Fund, we will be able to provide 50'000 subscribers with access to various analysis tools for free until 2019. This is practically all existing subscribers at the moment. If there are less than 15 000 people using the service, and we collect a $ 15 million Compensation Fund, then we will extend the period of free use of the service. We decided that in this case 10 000 subscribers will use the service free of charge until mid-2019, 5 000 users - until the middle of 2020.

Support Program

A reputation should be earned. But to do it earning money is twice as good.

Despite that any Authors and Experts at the start of the service couldn't have enough competence or reputation we will pay them a reward as a scholarship. Monthly amounts which will be spend on scholarships will raise during the supporting period with the raise of number of Authors and Expert users.

By the end of 2018 total rewards will be as much as 500'000 USD. These rewards will be paid in ETH to reduce number of DOBI tokens in circulation.

Experts and authors support program (in thousands of USD):

Year	2018										
Month	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Amount	50	75	100	125	150	200	250	300	350	400	500

4.3. Business models and token price

Funds collected during TGE are split into these funds:
- platform development fund (development, infrastructure, G&A)
- community development fund (education programs, learning materials, platform promotion)
- 3 special funds:
    - AntiDump fund
    - Funding program for Expert and Author users
    - Compensation program for Subscriber users

We have calculated three business model scenarios which is to be executed depending on total raised amount:

max - 50'000 Subscriber users utilize the platform for free by the end of 2019
**good** - 15'000 Subscriber users utilize the platform for free by the end of 2019
standard - we work without Compensation fund.

We plan to raise in these models (USD):

|	max	good	standard
Development	6 300 000	6 300 000	6 300 000
Product development	4 000 000	4 000 000	4 000 000
Community development	2 300 000	2 300 000	2 300 000
Special Funds	53 350 000	18 350 000	3 350 000
AntiDump Fund	850 000	850 000	850 000

Funding program for Expert and Author users	2 500 000	2 500 000	2 500 000
Compensation program for Subscriber users	50 000 000	15 000 000	0
Total	**59 650 000 USD**	**24 650 000 USD**	**9 650 000 USD**
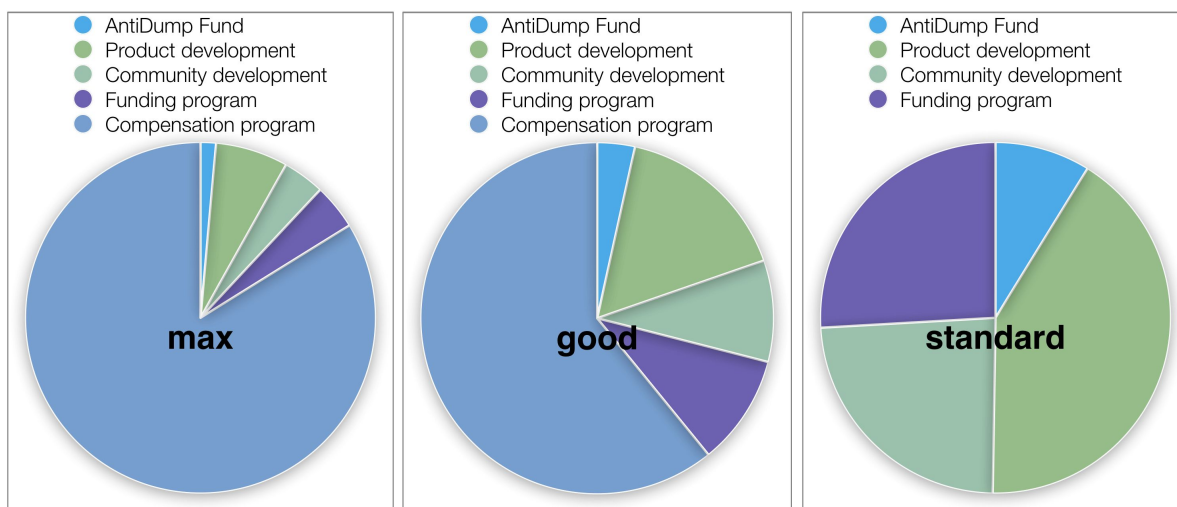
Total token supply (in DoBI):

	max		good		standart	
Presale	500 000	0,8%	500 000	1,9%	500 000	4,3%
Allocation (Bounty)	350 000	0,6%	350 000	1,3%	350 000	3,0%
Allocation (Founders)	1 000 000	1,6%	1 000 000	3,8%	1 000 000	8,7%
Development	6 300 000	10,2%	6 300 000	23,8%	6 300 000	54,8%
Special Funds	53 350 000	86,7%	18 350 000	69,2%	3 350 000	*29,1%*
Total	**61 500 000**	**100%**	**26 500 000**	**100%**	**11 500 000**	**100%**
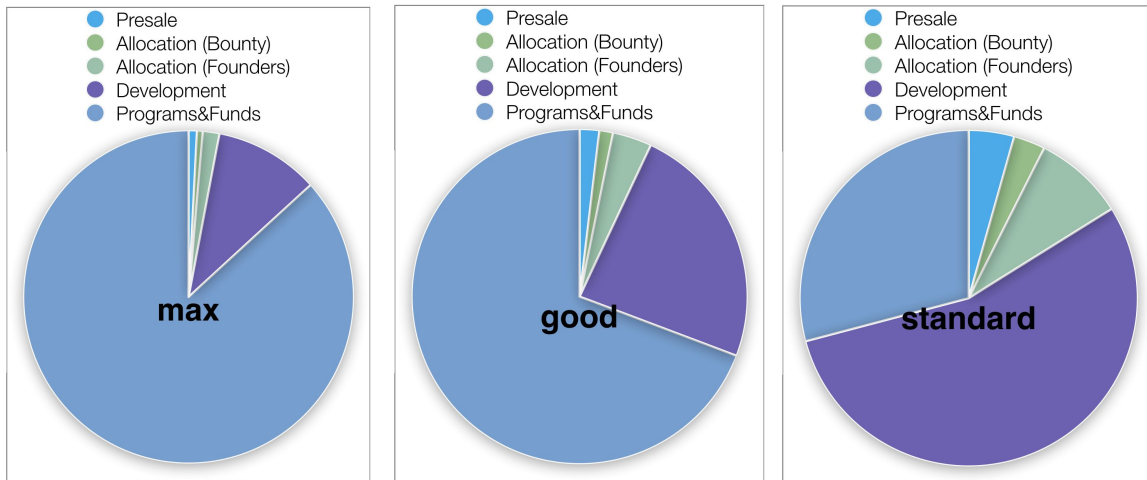
Allocation for Founders will be vested monthly for 1 year since finish of ICO (tokensale smart-contract will allow withdrawal of DoBI monthly).

Product Development Fund will be divided into two parts:

- 50% will be vested monthly for 2 years since January 2018 via tokensale smart-contract
- 50% will be put into Escrow service and withdrawal will be allowed on successful accomplishment of roadmap milestones (long-term roadmap will be defined by the ICO).

Community Development Fund will be vested monthly for 2 years since January 2018 via tokensale smart-contract.

4.4. Secret sauces

Secret sauce 1: Token supply burning

We will establish the Compensation fund not only to attract first users to platform and not only to support DoBI rate to be not lower than 1 USD. The Compensation fund will allow us to burn excess DoBI.

We will compensate to Subscribers only those DoBI which they has spent to pay the platform fees. So we as a platform will receive that DoBI. If we have compensated 15'000'000 USD it means that we had received 15'000'000 DoBI in fees. *We will "burn" these DoBI to reduce total DoBI supply.*

If a project is creating 100 tokens for 1 USD each during a TGE and total token issuance is 200 tokens then it means that minimum calculated token price is 0.5 USD.

(funded amount)/(total token issuance) = 100 USD / 200 tokens = 0.5 USD

As more tokens are issued before the TGE then lower the minimum calculated token price. Tokens which were issued during presale TGE are counted in total TGE issuance but at actual presale price with all discounts.

The burning of tokens will allow us to create reasons for which calculated minimum token price may be higher than it had been during TGE.

For example, in the 'good' model we allocate 24'650'000 DoBI within the TGE and each of them costs 1 USD, plus 500'000 DoBI at a price of 0.8 USD in the presale phase. The total issuance is 26'500'000 DoBI. Thus, the calculated minimum price of DoBI is 0.945 USD/DoBI:

(total amount of raised funds) / (total issuance) =
(24'650'000 + 500'000 * 0.8) / 26'500'000 = 0.945

However, within the 'good' model, we collect the Compensation Fund, which we will then burn, in an amount equivalent to 15'000'000 USD. Then taking into account the burning of tokens the calculated minimum price of DoBI will be 2.178 USD/DoBI:

(total amount of raised funds) / (total issuance) =
(24'650'000 + 500'000 * 0,8) / (26'500'000 - 15'000'000) = 2.178

In the 'max' model we distribute 59'650'000 DoBI within the framework of TGE and each of them costs 1 USD, do not forget to add the funds collected from the distribution of 500'000 DoBI at a price of 0.8 USD during the presale TGE. The total issuance size in the 'max' model is 61'500'000 DoBI. Thus, the calculated minimum price of DoBI is 0.976 USD/DoBI:

(total amount of raised funds) / (total issuance) =
(59'650'000 $ + 500'000 * 0.8 $) / 61'500'000 = 0.976 $

The 'max' model implies that we collect the Compensation Fund, which we will then burn in an amount equivalent to 50'000'000 USD. Then taking into account the burning of DoBI the calculated minimum price of DoBI will be 5.222 USD/DoBI:

(total amount of raised funds) / (total issuance) =
(59'650'000 $ + 500'000 * 0.8 $) / (61'500'000-50'000'000) = 5.222 USD

Unfortunately, burning of DoBI does not work in 'standard' model. We distribute only 9'650'000 DoBI at the TGE and this is not enough to set the Compensation Fund. Therefore, there will be nothing to burn. In fact, the calculated minimum price of 1 DoBI in the 'standard' model will be 0.874 USD/DoBI:

(total amount of *raised funds*) / (total issuance) =
(9'650'000 $ + 500'000 * 0.8 $) / (11'500'000 - 0) = 0.874

And this indicator is better than in the majority of projects!

Secret sauce 2: AntiDump Fund

In most cases, after the release of the token / coin on an exchange, the exchange rate depreciates. This is due to the fact that the token was placed at a discount and at the expense of the bounty campaign participants. The minimum price for TGE participants who bought a token with a discount is easy to determine: one should correct it for the size of the discount. A sensible person will not sell a token cheaper than it was bought. This is possible only if the player fixes his loss, but at the stage when the trades on the stock exchange have started, it is obviously early to fix any financial results.

The minimum price bounty campaign participants are ready to receive can not be determined because they received tokens for their work and not in exchange for money. Only they know how to evaluate their work, and at specific moment in time. Therefore, to anticipate the minimum price, to which the token will fall as a result of possible initial dump (for the first time the token is listed on an exchange) is impossible. But it is always possible to calculate with confidence the maximum amount of tokens that will be sold.

In all models the number of tokens distributed on the presale TGE remains the same - 500'000 DoBI, and the bounty campaign size is 350'000 DoBI, so the maximum number of tokens that could be sold within the initial dump is 850'000 DoBI. To ensure that the cost of the coin does not go down due to the initial dump, we create the AntiDump Fund and we know the maximum amount of tokens that could be sold within the initial dump. We will spend AntiDump Fund on the purchase of DoBI by subscription, that is, if the user wants to sell DoBI, he or she sends the request and the next day we will buy DoBI from him at the rate of closing the day of the request + 10%. The ransom rate can not be higher than 1 DoBI = 1 USD

Obviously, not everyone will want to sell their DoBI that is why less than 850'000 DoBI will be bought out. It is clear that buying DoBI at a market price that can be below 1 DoBI = 1 USD, we will not spend all AntiDump Fund. Therefore, all that we will not spend on buying 850'000 DoBI back within the first 2 months, we will transfer to the Support Program for experts and authors and distribute these funds in the December 2018.
Most importantly, all those DoBI tokens bought out during the initial dump will be burned, which will strengthen the withdrawal of DoBI effect in 'Max' and 'Good' models, and will allow to apply this effect even in 'Standard' model.

Secret sauce 3: Adequacy ratio

Decentralized money

Back in 1974, economist Friedrich Hayek explained a possible existence of private money in his work "Denationalisation of Money". He distinguished the terms "money" and "currency" and comprehensively studied such a phenomenon as money issued not only by the state. For simplicity, he called any institution capable of issuing money to circulation 'the bank', but immediately gave a remark, "this is not meant to imply that all banks will be issuing money" [9 p.58]. Even this progressive economist did not admit the idea that "money" will be issued not by financial institutions.

DoBI can not be called currency or full-value money because they serve as a medium of circulation only partially, that is, only within the framework of the Dolphin BI platform. F. Hayek called it "money substitutes". Despite this, we consider it very important to monitor two characteristics which are usually applied to money - stability and liquidity. These are two interrelated indicators and if we control stability of the exchange rate indirectly, then in the long run we will be able to regulate liquidity. We are not interested in sharp course jumps, for then the cost of our service will also be unstable, which is bad for consumers. Therefore, we

intend to actively use instruments of monetary policy, of course not on the macro level but at the level of our platform.

"If, as we shall provisionally assume, the aim of the issuing bank is to keep constant the aggregate price in terms of its currency of a particular collection of commodities it would, by regulating the amount of the currency in circulation, have to counteract any tendency of that aggregate price to rise or fall.
The issuing bank will have two methods of altering the volume of its currency in circulation: it can sell or buy its currency against other currencies (or securities and possibly some commodities); and it can contract or expand its lending activities." [9 p.60]

In Dolphin BI project we have the third opportunity!

We could influence the necessary amount of DoBI in circulation due to the **adequacy ratio** which reflects the 'commodity-money' balance of the Dolphin BI platform. That is, we control the correspondence between the volume of DoBI in circulation and the aggregate demand in DoBI for users to pay for the access to the platform.
At the platform go-live we will not release DoBI which will be received as a reward for using the platform back to the market (sell on the stock exchange). Thus, we will reduce the DoBI supply in circulation, which should leads to an increase in the DoBI rate.
Increase in the number of users of the platform and expansion of the paid widgets will lead to a growth of demand for DoBI. And given the decrease of the amount of DoBI in circulation we can expect the rate growth.

It is clear that as the rate of DoBI increases then demand is decreased. However, we have built a system in such a way that we can immediately act upon several indicators.
In order not to lose customers, we will reduce the price for services, which is counted in DoBI. In fact, in the fiat money, for example in USD, the price will not decrease and we will try to keep it at a optimal for platform growth level. But growth of the DoBI rate will not be artificially inhibited.
However we have not yet decided how to implement this mechanism in a decentralized manner but most likely we will follow the path of DAO organization.

Compensation for prepaid: who pay in advance can receive a bonus

Prices of the platform services can be updated every month. Both Dolphin BI developers and independent apps/widgets authors can update them beginning of the next month with preliminary notification 10 days before change will take in effect. Of course, we will support the price reduction and not very welcome its increase, but in any case we will stick to the principle: who pay in advance can receive a bonus.

That is, if the user paid for the service for a few months in advance and the price of the service increased, there will be no recalculation and, in fact, he receives the service at a lower price. In case of a price reduction, recalculation takes place and the user receive the difference in DoBI to their account.

For example, John has paid 3 months for 10 DoBI each. The first month passed and the price has decreased to 5 DoBI. Then John falls under the recalculation and receives back 10 DoBI.

5. Token generated event conditions

There will be two token generated events (TGE):

- preliminary TGE (DBIP token)
- main TGE (DOBI token + conversion of DBIP tokens into DOBI tokens)

At the preliminary TGE there are two stages: private and then public. The cap for private TGE is set at 400'000 USD. If the milestone is not reached, the remainder will be open for public at public stage. Otherwise the cap will be raised to 600'000 USD for the public stage so that subscribers without preliminary agreements can participate as well. During the preliminary TGE the DBIP (Dolphin BI Preliminary) ERC20 token will be generated.

There is a 25% bonus during the preliminary TGE, i.e. DBIP tokens will be provided at 1 token per 0.8 USD. During the main TGE there will be no bonus and the primary DOBI token will be provided at 1 DOBI per 1 USD. We will perform a 1:1 conversion DBIP tokens to DOBI tokens before the main TGE.

DBIP and DOBI tokens will be delivered to subscriber's Ethereum account. The conversion rate will be calculated according to the ETH/USD rate at 9:00 UTC (GMT+0) with rate from https://api.coinmarketcap.com/v1/ticker/ethereum/.

We will accept BTC and other digital tokens from the subscribed subscribers during the private stage. In that case, the conversion rate is agreed upon by parties individually and DBIP tokens will be sent manually. The conversion rate will be calculated according to value of the provided tokens in USD at the end of previous day (per http://coinmarketcap.com).

At the second stage, the participation is only possible through the Ethereum smart contract.

The volatility risk should be also considered. For example, if during the preliminary TGE 1 ETH is 200 USD, then the subscriber can receive 250 DBIP for 1 ETH (200/0.8). If 1 ETH is 300 USD at the moment of the main TGE then subscribers can receive 300 DOBI for 1 ETH, while preliminary subscribers will only receive 250 DOBI through the conversion. This is a common occurrence during ICOs. Therefore, we are ready to carry 50% of the volatility risk. We will compensate 50% of preliminary subscribers' loss due to rate growth from the "team reward" part of the token distribution. In the aforementioned case, the preliminary subscriber will gain 275 DOBI, which will mitigate half of their losses. Automatic DBIP to DOBI conversion will be performed at the beginning of the TGE. This insurance bonus will be calculated according to the ETH/USD rate at the beginning of main TGE (per http://coinmarketcap.com).

One should also consider that if during the main TGE 1 ETH is 50 USD, then the preliminary subscriber increases their number of DOBI fivefold.

6. Roadmap and launch strategy

Because a collaboration platform must solve the "Chicken and egg" problem (subscribers will not come to the platform if there are no experts, and the experts will not come if there are no subscribers) and the "Ghost town" problem (ensuring that experts create value for a long time) [7] the following launch strategy will be used:

- first widgets and data providers will be created by the platform's development team to demonstrate widget conception and create a stable framework
- to bring good data providers to the platform partnerships will be established, financed by the Development fund
- to attract authors and experts onto the platform the funding program for 'Expert' and 'Author' users is established
- if the Compensation fund is raised then it is used to additionally motivate Subscriber users to join

milestone 1 *Aug 2017*	Release of Whitepaper and landing page in English. Release bitcointalk.org sentiment analysis MVP. Prepare to launch the preliminary TGE with the following goals: - attract early contributors with whom the project can be discussed in detail - receive feedback from early backers on what is clear and attractive or unclear and repelling to update project vision - verify whether users require a solution for the defined problem, - develop requirements for MVP according to received feedback - receive funding to promote the project and the platform.
milestone 2 *Sep 2017*	Finish the preliminary TGE. Release MVP with dashboard and at least four widgets: 2 automatic (machine learning) and 2 manual (expert) widgets. Start process of filing information showed in MVP.
milestone 3 *Oct 2017*	Finish the main TGE. Publish a detailed roadmap updated with understanding of funds raised Launch full-scale development of the final product Attract data provider partners
milestone 4 *Jan 2018*	**Beta release:** - smart-contract is in testnet - bug-bounty program starts
milestone 5 *March 2018*	**Production release (version 1.0):** - first public release of in-house developed platform - most widgets and data providers are created by the core team - community content - bug-bounty program continues

milestone 6 *May 2018*	**Production release (version 1.1):** - update in-house developed data providers - integrate data provider partners - add more widgets - publish the official guidelines and online courses for development and deployment of widgets and data providers (development platform framework) - incentivize third-party developers (Authors) to join - update roadmap
milestone 7 *July 2018*	**Mobile app for Android** - release mobile application for Android - publish a framework for mobile widgets and online courses
milestone 8 *September 2018*	**Mobile app for iOS** - release mobile application for iOS - update a framework for mobile widgets and online courses

In the MVP (milestone 2) release two automatic machine learning widgets are to be implemented:

- **Whitepaper Clustering**. A tool to quickly find similar whitepapers in the database and pinpoint keywords. It allows the user to quickly understand the main idea and to assess the market in which the crypto-asset operates, as well as its main competitors.
- **Social Networks Sentiment Analysis**. After gathering text data from several social media outlets (Twitter, Facebook, Bitcointalk, Reddit, etc.) and running it through the algorithm, this widget provides the user with opinions of public and some key persona in the blockchain world on the crypto-asset. The widget also displays the keywords which often appear in media mentions and statistics on the activity of the crypto-asset team in its social media channels.

Also, two manual widgets are to be implemented:

- **Expert evaluation.** ICO evaluation by experts.
- **Wikipedia for crypto-assets.** A tool to add a new crypto-assets to the list by any user. After an easy moderation this asset became available for all users. Later this widget will be migrated to the version where any Expert with some minimum rating can accept adding an asset to the list.

The number of widgets available at production releases depends on funds raised during the TGE and their exact specifications will be defined later.

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Appendix 1

Each subscriber has their own 'voting influence' which is recalculated each month from the following formula:

$$I_i^m = (S_i^m + B_i^m)^{\alpha} \qquad (1)$$

I_i^m - subscriber i voting influence for month m

S_i^m - subscriber i spendings per month m

B_i^m - subscriber i average daily balance during month m

α - voting influence boosting factor, initially set equal to 1,5

Boosting factor is used to prevent sybil attack by creating a lot of Subscribers

For a given month m for expert e and crypto-asset p the rating R is:

$$R_{e,p}^m = \frac{\sum_{k=1}^{K_p^m} V_{i_k, e, p}^m \cdot I_{i_k}^m}{\sum_{k=1}^{K_p^m} I_{i_k}^m} \qquad (2)$$

K_p^m - the number of subscribers who participated in crypto-asset p voting in month m

i_k - a subscriber who participated in voting for crypto-asset p in month m

$V_{i_k, e, p}^m$ - a score (1 to 5) that subscriber i_k has given expert e in crypto-asset p in month m

$I_{i_k}^m$ - voting influence of subscriber i_k in month m

Rating R is only calculated for an expert if they have received at least 2%[10] of votes in a widget for the crypto-asset. This allows to cut off votes cast by sybil subscribers. Otherwise the rating is set to zero.

An Expert average rating $\overline{R_e}$ is calculated as the average of all received scores from subscribers in the last 3 months (M=3):

$$\overline{R_e} = \frac{1}{M} \cdot \sum_{m=1}^{M} \frac{\sum_{p=1}^{P_e^m} R_{e,p}^m}{P_e^m} \qquad (3)$$

M - the number of months for which the rating is calculated

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[10] Research will be done to set this value not as a constant, but as a variable, which is recalculated dynamically according to the rule: the cost of attack should be bigger than possible profit. During MVP development this feature will be implemented.

P_e^m - the number of crypto-assets that expert *e* has evaluated in month *m.*

Expert average rating $\overline{R_e}$ is set to zero at the moment of expert's sign up.

When the fee allocated to crypto-asset *p* in widget *w* is distributed, the following formula is used to calculate distribution basis $D_{e,p,w}^m$ for each expert *e* in month *m* (we use a harmonic mean because it imposes a bigger penalty on smaller values of R than a standard mean):

$$D_{e,p,w}^m = \frac{\overline{R_e} \cdot R_{e,p}^m}{R_e + R_{e,p}^m} \cdot ln \ T_{e,p}^m \quad (4)$$

$T_{e,p}^m$ - the number of votes given for expert *e* in month *m* in crypto-asset p section of the widget*.*

D is not required to be bounded, because it is normalized in the end, therefore the coefficient 2 for the harmonic mean is dropped for a cleaner formula.

Using this basis *D* the share *H* of each expert fee is calculated:

$$H_{e,p,w}^m = \frac{D_{e,p,w}^m}{\sum\limits_{e=1}^{E_{w,p}^m} D_{e,p,w}^m} \quad (5)$$

$E_{w,p}^m$ - the number of experts that participated in evaluation of crypto-asset p in widget w in month m.