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Target Audience

The following document might be of interest for scientists, engineers, pharmacologists, pharmacological companies, businessmen, financial analysts, investors, miners, programmers and cryptocurrency enthusiasts.

Purpose

The project suggests using the computational capabilities of the sub allocated mining networks for finding new types of medicine, protides, other chemical compounds useful for people and similar economically attractive calculations. Cryptocurrency miners use their immense computational capabilities for calculating unique but completely useless information. Project "Elige.re" will direct these computational capabilities to the benefit not only of the participants of the project but of the humanity as a whole.

How

We will combine the existing systems of grid calculations specializing in searching of the new types of medicine (such as the BOINC project) and chemical compounds with the help of the block chain technology. We will use the search of all the possible variants basing on the computational calculations of the participants of the network – the miners – to find the data we need. Later we will expand the functionality of the platform using neural network to increase the probability of discovering the required data. The processed variations will be stored into the blockchain. The miners will receive rewards in platform's tokens for processing the data and substantial rewards for solving computational problems.

Business Model

After the Elige.re platform will receive suitable data, the discovered solution will be partially or fully locked for a year's period by the smart contract and offered to the interested pharmacological companies and corporations. The profits gain will be used to buy the platform's tokens, thus raising the price for the project's tokens and indirectly paying out dividends to the owners of the Elige.re platform's tokens. In case if the data discovered by the platform will not be bought during the year, it will become unlocked automatically and available to all the interested parties without any limitations for usage.

Difference from Similar Projects

The main difference from such projects as sonm or golem is that our project suggests not to sell the computational capabilities but to use them for quite specific calculations. Unlike our project, such projects as gridcoin don't do anything useful, in general, they parasite on the others' calculations and present those calculations as the proof of work (PoW).

Applicability

Why Pharmacology

- From the point of view of people, there is nothing more valuable than their own health and health of their relatives.
- From the point of view of demand – this field is in need for the immense calculations which can be provided by the miners located all over the world.
- From the point of view of the finances – the pharmacology market is the second in the world in terms of volume, following the weapons market.

New Antibiotics Development

Nowadays mankind has a serious problem: constant appearance of the bacteria immune to the existing antibiotics. And the scientists don't have enough resources to fight off the ever-growing tide of new bacteria immune to all the known antibiotics. Before the invention of the antibiotics, people dying of infectious diseases before even reaching thirty years were a regular thing. If we don't develop new types of antibiotics, it might return in the nearest future.

For instance, according to [American](#) [center](#) [of](#) [disease](#) [control](#), a woman died because of a similar bacterium in the end of 2016. All the drugs legal in the US were of no use against such a pathogen. The reason for this is that because of constant and total usage of the antibiotics there are bacteria immune to all the known antibiotics.

Search of the Medications

Drug-design or rationalized creation of medications is a field of research actively developed in the recent years. Discovering of the potential medical compounds which block reproduction of the harmful viruses and bacteria in human organism is one of the problems which can be solved by the Elige.re platform. It is almost impossible to check experimentally, if each molecule is a cure for this or that disease. This is why it is necessary to conduct primary selection in this immense variety of chemical compounds basing on their structures and known properties. There are a lot of ways to achieve this goal: for instance, molecular docking and molecular dynamics.

Cancer

One of the most dreadful diseases, terminal in its final stages. Cancer is one of the major death reasons for the people all over the world. It comes in many types and forms in which uncontrollable growth of the cells can spread to other body parts. Uncontrollable and untreated cancer can spread from one place to another, to other body parts and eventually lead to death. The project is aimed at well-round and platformatic discovery of clinically useful markers (unique chemical indicators) for early discovery diagnosis of cancer and forecasting reaction to curing. Early discovery of cancer increases chances for recovery drastically.

HIV

Human immunodeficiency virus. This disease is dangerous for men, women and children. Currently there is no way of curing it other than taking large amounts of medications.

The platform will be searching among millions of chemical compounds for the substances capable of blocking the virus protease to make it impossible for the virus to reproduce.

Protides

Protides Folding

The aim of these calculations is to model the process of coiling and uncoiling of protides molecules to get a better understanding of the origins of such diseases caused by defective molecules as Alzheimer's disease, Parkinson disease, diabetes of the second type, Jakob-Creutzfeldt ("mad cow") disease, sclerosis and various forms of oncological diseases.

Prions

Prion is a protein molecule, in its "regular" form it is present on the surface of the nerve cells of anyone of us. B 1997 the scientist who had defined the prion and developed the prion theory was awarded with the Nobel Prize. For the reasons unknown, sometimes the "regular" protide is "reborn" into its "infectious form" with dreadful consequences. Prion "glues up" with other molecules and "convert" them into the same form, causing the "molecular epidemi". As a result, the neurons disappear one after another, brain turns into a sponge and death comes inevitably afterwards. If the accountant of the prions is conducted in a right way, one may not only find the cure, but also make a breakthrough in an absolutely new field of science.

Chemical Compounds Research

The task of searching the chemical compounds can be divided into two parts, each is calculated separately. Due to the fact that calculations are conducted on a large number of personal computers connected to the network of grid calculations there is a high probability of receiving a list of new promising chemical compounds for synthesizing and researching of their probable properties. For example, let's take a research of new organic materials for producing solar batteries. It is expected that solar photocells based on organic compounds will be more effective and cheap than modern silicon solar batteries.

Elige.re Platform

The usage of grid calculations is the next step in the development of scientific researches. Scientists from all over the world are working on projects which demand performing more and more calculations.

What is GRID

GRID is a combination of several computers solving a single computationally complicated task divided into sub-tasks. Each computer completes several sub-tasks and the results of separate calculations are combined. The main advantage of GRID is that it can consist of computers located thousands of kilometers from one another and having different properties, both hardware and software. The task of combining such inhomogeneous computers is completed by middleware which connects all the computers virtually via the Internet into a single supercomputer. The idea of GRID has appeared in 1990s when with the development of means of computer communications, the connection of mutually geographically remote computers became a cheaper, more simple and potentially more efficient means of increasing the performance than expanding the capacities of a single supercomputer.

Organizing grid computing requires appropriate software platform. The system should know how to divide a single complex task into a great many of small subtasks, distribute these subtasks into computational nodes, receive the results of the calculations and combine them into a single whole. Various software "interlayers" between the managing server and computational nodes were created for this purpose. The Elige.re platform is one of such software "interlayers".

Network Structure

The Elige.re platform's network will work on a hybrid p2p protocol and is organized on two levels. The level of miners, which will have the main computational load, will do the computing.

The super-node level will coordinate and check the accuracy of the calculations. On the first stage the super-node level will be taken up by the Elige.re servers.

General Description of the Platform

Sub allocated Elige.re project consists of:
1. compound super-node server, distributed into several physical servers in the interests of increasing of performance, fail-safe behavior and security, which gives tasks to miner clients and gathers the results,
2. a variety of miner clients connected to the super-node which do the main job of computing and receiving the results,
3. and, possibly, an additional component of connected GRID-networks.

Each miner client gets connected to the super-node server and receives a processing task.

Some time later, when the task is completed, the client program connects to the super-node server once again and transmits the results, afterwards receiving a new task. For completing the task, every project participant owning mining clients will receive the Elige.re platform's tokens, proportionally to the processor time spent on calculating.

However this scheme of a grid calculation project has several risks:
1. First of all, miner client who has received a task, might never contact super-node again for certain reasons. For example, if a project participant

owning a miner client loses interest to the project or because of other consequences, such as power cutoff.

2. Secondly, project participants might send wrong results. This is more dangerous than simple lack of results, because a single wrongly calculated task can be totally disastrous for all the other calculations!

3. And thirdly, project participants might try to receive more tokens than they have spent on performing computations.

The first problem is solved simply – the Elige.re platform denotes the deadline until which the mining client has to turn in the results. The second problem is solved by giving the same task to several users, which is called redundant computation. For each task, the number of duplicating performers is individual, but the Elige.re platform's default number is four. When mining client reports on calculations conducted, the super-node server compares the results, sent by various participants. The result, accepted by the "quorum" of super-node servers is considered to be the correct one, and the wrong ones are rejected. The participants who have given in wrong results don't receive tokens and get an entry in the control grey list with scoring penalty points. The number of servers composing a "quorum" is also specific for each task and by default is three. This form of checking the results is exactly why one will observe the delays in counting of the earned tokens.

The third problem is solved just like the problem of wrong answers – with redundant computations. The Elige.re platform will be calculating simultaneously from two or more project tasks to avoid the idlesse of computational capabilities in case if one project task ceases calculations. Each task project which is being calculated, has a large but finite volume of calculations. During the course of calculations in a task project, the volume of required calculations will reduce and the probability of finding the desired data will increase. Accordingly, because of this the price for the Elige.re platform's tokens will increase in proportion.

Calculations Mechanics

One large computing task project is divided into a number of small sub-tasks by the super-node server. A list of subtasks is created, afterwards it is shared between the other super-nodes and after the synchronization process the list is recorded into the blockchain. One super-node covers a part of the list and redistributes the subtasks to the computational nodes – miner clients. Each subtask is sent to several mining clients to provide computation redundancy and to exclude cheating from the side of miner. Giving out each new set of subtasks, super-node includes there several addresses of other super-nodes chosen randomly and currently being online and available. Miner client has to send the results not only to the super-node which has given out the set of subtasks, but also to the addresses of super-nodes attached to the set. This will allow to exclude the possible falsifications and collusions from the part of the super-nodes.

After having finished the processing of another block of calculations, the miner client sends the obtained data to the addresses of super-nodes indicated in the set of subtasks. The block is verified by comparing the date, received from various miner clients and various super-nodes enlisted in the calculated set, and the decision upon this block is being made. In case if received calculations don't match, all the participants of the block, both miners and super-nodes get an entry in the grey list and receive penalty points. This will lower the priority of getting a subtask in case of

miners and distributing subtasks in case of super-nodes. After achieving a critical number of penalty points the participant is excluded from the network and gets into the black list.

In case if the received calculations are valid and the data from different miners match, the super-nodes conduct the procedure of achieving the consensus. After consensus is achieved, the emission of tokens takes place, in accordance with the amount of the processing efficiencies spent by the miners participating in the calculation of the data block and the super-nodes coordinating the process. Information on performed calculations, and the link to the subtask in the list of the tasks is recorded into the block-chain, as well as information on the participating miners and coordinating super-nodes.

Calculations Conclusion

After discovering the required data in one of the task projects, the platform initiates the procedure of conclusion of the project's calculation cycle. All the participants calculating the block in which the data was found, receive bonus of hundredfold tokens.

The discovered data get successively encrypted by several public keys belonging to various highly-rated super-nodes from whitelist which have a large amount of the platform's tokens on their balance. After that, the encrypted data and information on the super-nodes having the private keys are recorded to the block-chain. To avoid the loss of received data as a result of losing one of the super-nodes, the procedure of encrypting is conducted several times with the involvement of different groups of super-nodes matching the required criteria. All the tokens emitted by the platform and given out to the miners for completing this task project are counted. A smart contract is created, checking for one of the conditions:

1. it's the date a year later from the current one;
2. **or** the account of the smart contract is refilled by the corresponding amount of tokens emitted by the platform to complete the task.

In case of achieving one of the conditions, the smart contract will request the closed keys from corresponding super-nodes and will decrypt the encrypted data. In case of the achieving condition (1) the decrypted data will be recorded in the block-chain openly. In case of the achieving condition (2) the decrypted data will be sent to the receiver's wallet's address in exchange of corresponding amount of tokens sent to the address of the smart contract, encrypted with the open key of the receiver's wallet in advance. After that, private keys will be eliminated, the tokens sent to the contract will be burnt and the information on the calculations will be deleted to spare the disc space of the participants of the Elige.re platform. Such a scheme will allow the interested parties to exchange the discovered data for the platform's tokens automatically, without involvement from any brokers including the project's crew. To perform the exchange, one has to purchase the corresponding amount of the platform's tokens, indicated in the smart contract concluding the results of the calculations, at the cryptocurrency exchange floor.

After the creation of the smart contract concluding the data, the Elige.re support team and super-node storing the private keys receive a notification that an advertisement is required to attract the interested parties to the discovered data and suggest them to exchange the data for the corresponding amount of the platform's tokens indicated in the smart contract.

Project's Stages of Development

Pre-sale Campaign Conducting

To conduct the advertisement campaign and other preliminary events for the ITO campaign, the pre-sale of the "ELG" tokens for reduced price will take place. See "Pre-Sale" in "Shared Financing" for more information.

Emission of the "ELG" Tokens

After the end of this stage, an emission of the "ELG" tokens will take place at the block-chain platform etherium and their sending to the wallets of pre-sale participants.

ITO Campaign Conducting

See "ITO" in "Shared Financing" for more information.

Listing of the "ELG" Token

Upon the ending of the ITO campaign the "ELG" tokens will be transferred to cryptocurrency exchange floors.

Basic Functionality Realisation

During this stage, the basic functionality of the Elige.re will be realized, see "Stage 1" in "Technical Realization" for more information. This will allow using the computational capabilities of the grid network of miners and launching the basic directions of calculations.

Emission and Listing of the"ELIGE"Tokens

Upon the finishing of the realization and launching of this stage the emission of the "ELIGE" platform tokens will take place in the amount equal to that of the "ELG" tokens and the "ELIGE" tokens will be transferred transferred to cryptocurrency exchange floors.
The "ELG" tokens will be exchanged to the "ELIGE" platform tokens at 1:1 rate. The exchanged "ELG" tokens will be destroyed to avoid the impairment of their value.

Expanding of the Platform

The platform's basic functionality will be further expanded by additional functional opportunities, see "Stage 2" in "Technical Realization" for more information. This platform expansion will cheapen the development of the calculating modules and also will increase efficiency and speed of calculations.

Neural Network Integration

The next step will be the expanding of the platform by the support of neural network see "Stage 3" in "Technical Realization" for more information. Such an improvement will allow to direct the calculations more accurately.

Freewheeling

For the first several years the project will be supported and developed by the Elige.re crew. The final stage of realization of the project will be the creation of several additional mechanisms to insure the fully automatic functionality of the platform. We will create a forum which will be integrated into the platform's block-chain. There also will be a committee on controlling and development of the project, which will eventually replace the Elige.re crew.

Technical Realization

Stage 1. Implementation of Basic Mechanisms

During this stage basic components of the platform will be realized: miner clients, super-node, block-chain. C++ will serve as the main programming language.

Super-Node

Super-Node consists of several components: task generator, planner, validator, results assimilator. Super-node may assume various roles. The roles change at the end of a timespan and are appointed according to the rating.
Among other roles there are:

Master

Super-node with this role generates and gives out tasks for miner clients. It creates the list of the super-nodes which receive answers from miner clients. It sends managing messages to other super-nodes.

Slave

Super-node with this role receives managing messages and performs the required actions. It stands by for the changing of the role. It receives answers from mining clients, checks the results of the calculations and sends the result of its work to a super-node with the "Master" role.

Miner Client

A miner client with integrated hypervisor. It receives subtasks from the super-nodes and performs calculations indicated in a subtask. Afterwards it sends the results of the calculations to the super-nodes in accordance with the list indicated in the subtask.

Hypervisor

On the part of the miner client hypervisor will be used as a "sandbox" – virtual surroundings. All the calculations will take place inside the hypervisor, thus isolating the computing code from the other part of the miner's software environment.

Such an approach will allow to utilize almost any software currently existing instead of writing specialized software which is quite expensive from the point of view of both financing and time frames. This architecture allows to launch the platform and start calculating ASAP. Some of the hypervisor functions are located on its background, they allow to calculate iterations of the virtual processor, which will allow easy control of the miner's processor time which was spent. For easier realization of this task the most adequate open source C/C++-based hypervisor will be chosen and integrated into the mining client.

"Softcore" mode

Miner client has the "activation during idlesse / stopping after receiving signals from the keyboard, mouse, or other input devices" mode. A simple mechanism of miner client installation on the computer – "installation with a click" – will be realized as well. For the casual users willing not only to help the humanity, but also to make some money on the computer that most of the time is not used anyway.

Blockchain

A very own layered/off-chain native blockchain supporting p2p-network and the "ELIGE" tokens will be developed for the project. The main layer of the block-chain stores the transactions, addresses and balances of the platform's tokens. The other layers and the off-chain data are attached to the main layer. Each task project has its own layer for storing the calculated data blocks and indexes. Some of the layer types:

- main – the main layer, transactions storage;
- super – storage of the data on super-nodes, routings, ratings, white/grey/black-lists and other data concerning the level of super-nodes interaction, calculations coordination, etc.;
- project – storage of the data on common data of a single task project, super-nodes and miner clients participating in the calculations of this task project;
- index – storage of the indexes of one layer to another for simpler and faster inter-layer interaction;
- off – storage of the off-chain data;
- temp – storage of the temporal data.

Such subdivision of the block-chain data not only will make the work and managing of the platform easier but will also allow deleting the data on the concluded task projects which is not needed anymore.

Smart-Contract

For faster and simpler development, the required functionality of smart contracts is brought beyond the Elige.re platform and realized by partial integration into the project of the Ethereum block-chain platform. However, in the future, during the

[Stage](#) [4](#) of the platform's realization, the functionality of smart contracts will also be implemented.

Stage 2. Expanding of the Platform

Interpreter Integration

During this stage, the platform will be expanded by the interpreter of the [Python language](#). Integrated interpreter will allow developing calculating modules rapidly. Due to the fact that the language is so broadly used and its simplicity, the entrance level for writing program modules describing the platform's calculation algorithms will be lowered.

Virtual Processor Development

During the next stage, a specific virtual processor based on [LLVM](#) will be developed, which will allow optimizing the calculations greatly. In addition, due to the advantages of the [LLVM](#) platform, the project will allow usage of a broad variety of hardware processors supported by this platform almost directly, which will increase the performance drastically.

Expanding to the Mobile Platforms

The development and adaptation of the miner client for the mobile devices such as smartphones, tablets, etc. Computational capacity of modern mobile devices is quite high, and it will be a mistake to ignore these platforms. To cover this sector of the computational park the clients for the most popular mobile operating systems will be developed. Currently they are Android and iOS.

Stage 3. Neural Networks

It is a well-known fact that, for instance, convolutional neural network can quite successfully detect melanoma (skin cancer). Trained on great many of known molecules, the neural network can offer completely new molecules. We can develop individual medications to cure rare diseases and even separate patients. Generative competitive networks using training and reinforcement is the future of pharmacology. The next step for the project is the development of the combined neural network. The neural network will be trained using the adequate data gathered in advance.
Afterwards we ensure the platform's supporting the neural networks and a ready and trained neural network will be integrated into the project. Such a step will allow optimizing the calculations and will increase the probability of valuable data by predicting more correct directions for calculations made by a neural network.

Stage 4. Support and Accompaniment

During this stage we will provide support and accompaniment to the platform – correcting the errors, eliminating the flaws, introducing small improvements and additions to the platform's mechanisms. Also we will prepare the platform to the automatic existence in the "[freewheeling](#)".

In particular, we will realize the mechanism of the selling of the computational capabilities for the inner tokens of the platform in form of personal marketplace or placing them in correspondent platforms. This will serve as an additional source of financing of further support and development of the platform.

Shared Financing

The project is rather complex in some technical aspects and touches upon not only Computer Science, but also such scientific fields as medicine, biology and chemistry. To realize the project, we will attract a bioinformatics scientist and a biochemist to the developer crew for the correct task definition for implementation of calculating modules. We also contact universities and institutions. Obviously, without sufficient financing, on bare enthusiasm, it is impossible to realize and support the project on the proper level.

This is why we are going to conduct the ITO campaign.

Hint: ITO stands for "initial token offering".

For this purpose there will be an emission of 100 000 000 "ELG" tokens to the Ethereum blockchain platform.

Up to 7% of tokens will be spent on preparing and conducting of the ITO and Bounty campaigns.

Pre-Sale

To conduct a good marketing campaign of the project and other preliminary events for the ITO campaign, the pre-sale of the "ELG" tokens will take place on the price 50% lower in comparison with the ITO campaign's.

The "ELG" token's price during the pre-sale will be bound to the ethereum's one in the following proportion: **ELG = ETH / 800** . That is, with the price for the ethereum's tokens equaling \$300, relative price for one "ELG" token in dollars will be \$0.37 accordingly. Up to 20% of total amount of the "ELG" tokens emission will be offered for sale during the presale stage. The crediting of the "ELG" tokens to the wallets of the pre-sale participants will take place during the week after the pre-sale company. You can specify the date of the pre-sale ending in the "Road Map" section.

Bonuses

Bonus for purchasing a large amount of the "ELG" tokens:
> ➢ from 1 000   + 1 % to the volume
> ➢ from 10 000   + 2 % to the volume
> ➢ from 100 000   + 3 % to the volume
> ➢ from 1 000 000 + 4 % to the volume

Bonuses are available during the whole time of the pre-sale and ITO campaigns.

Discounts

At the first day of the pre-sale the 30% discount is available, while during next 3 days there will be a 20% discount.

ITO

During the ITO campaign stage the "ELG" tokens will be offered according the following scheme:

The "ELG" token's price during the pre-sale will be bound to the ethereum's one in the following proportion: **ELG = ETH / 400** . That is, with the price for the ethereum's tokens equaling $300, relative price for one "ELG" token in dollars will be $0.75.

The tokens unclaimed during the ITO campaign will be burnt.

After the ending of the ITO campaign stage, the "ELG" tokens will be transferred to the cryptocurrency exchange floors during a month.

Discounts

The alteration of the price for tokens in time during the ITO campaign:
- ➢ 1st hour from the start   50 %   up to 10 mln of tokens
- ➢ during three hours   60 %   up to 20 mln of tokens
- ➢ during the first day   70 %   up to 30 mln of tokens
- ➢ during three days   80 %   up to 40 mln of tokens
- ➢ during the first week   90 %   up to 50 mln of tokens
- ➢ the rest of the time   100 %

The bonuses for purchasing a large amount of tokens is still available.

Disposition of Funds

The disposition of the funds attracted during the ITO campaign will be taking place in following proportions:
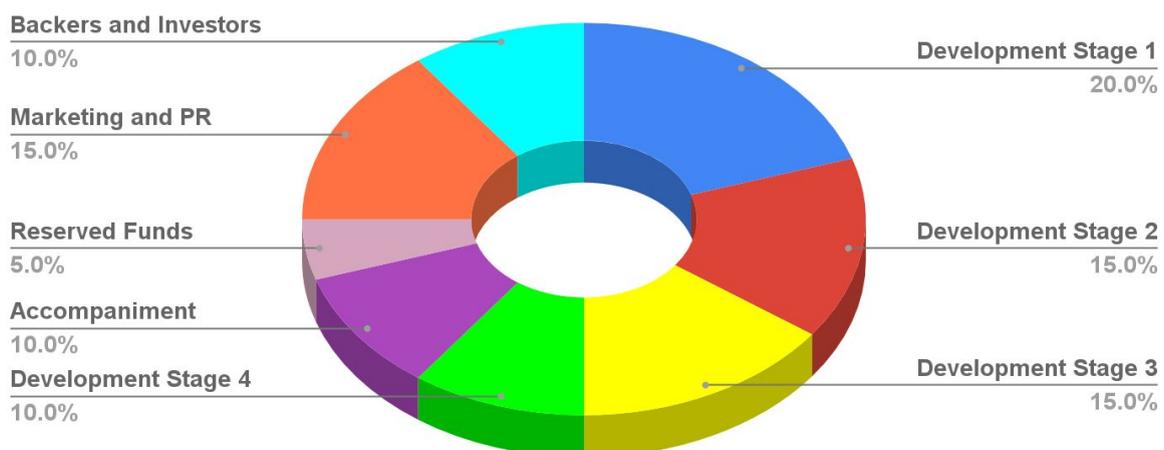
- ➢ 15% - Marketing and PR
- ➢ 10% - Backers and Investors
- ➢ 20% - Development and launch of the first stage of technical realization
- ➢ 15% - Development and launch of the second stage of technical realization
- ➢ 15% - Development and launch of the third stage of technical realization

➢ 10% - Development and launch of the [fourth stage](#) of technical realization
➢ 10% - Accompaniment and further development
➢ 5% - Reserved funds

Road Map

- **Q3 2017**
    - ○ Foundation of the project
    - ○ Development of the concept
    - ○ Preparation and planning

- **Q4 2017**
    - ○ 01.11 – Start of the marketing and bounty campaigns
    - ○ 01.12 – Start of the "ELG" tokens pre-sale, at 15:00 GMT
    - ○ 01.01 – End of the "ELG" tokens pre-sale, at 00:00 GMT

- **Q1 2018**
    - ○ 10.01 – Start of the massive marketing campaign of the ITO
    - ○ 20.02 – Start of the ITO selling of the "ELG" tokens, at 15:00 GMT
    - ○ 30.03 – End of the ITO of the "ELG" tokens, at 00:00 GMT

- **Q2 2018**
    - ○ The "ELG" tokens' transfer to the exchange floors
    - ○ Development of the basic part of the platform ([Stage 1](#), of technical realization)

- **Q3 2018**
    - ○ Test of the basic part of the platform
    - ○ Launch of the basic part of the platform
    - ○ The "ELIGE" tokens' transfer to the exchange floors

- **Q4 2018**
    - ○ Exchange of the "ELG" tokens for the "ELIGE" tokens
    - ○ Expanding of the platform ([Stage 2](#), of technical realization)

- **Q1 2019**
    - ○ Test of the expanded platform
    - ○ Launch of the expanded platform

- **Q2 2019**

  - Development of the neural networks for the platform ([Stage](#) [3](#), of technical realization)

- **Q3 2019**

  - Test of the neural networks
  - Training of the neural networks

- **Q4 2019**

  - Integration of the neural networks into the platform

- **Q1 2020**

  - The project switches to the [support and accompaniment](#) mode

- **Q4 2020**

  - Preparations of the "Freewheeling" mode of the project

- **Q4 2021**

  - The project switches to the "Freewheeling" mode

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